



Turun yliopisto
University of Turku



UNIVERSITY OF TARTU

EVALUATION OF THE OUTCOMES OF ENTREPRENEURSHIP EDUCATION REVISITED

Evidence from Estonia and Latvia

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ABSTRACT

This dissertation addresses two major gaps discernible in contemporary entrepreneurship education (EE) research: firstly, the lack of comparative studies on different forms of EE, such as traditional and experiential, which would test the widely accepted assertion that experiential EE is more effective in generating the desired outcomes in learners; secondly, the lack of evidence of how objective expressions of entrepreneurial behaviour in self- or paid employment are dependent upon entrepreneurship-specific competences that can be developed throughout EE. In bridging these gaps, the dissertation proposes and tests the integrative framework for evaluating the outcomes of EE that conceptually relies on Bloom's taxonomy of educational objectives (Kraiger et al. 1993; Bloom et al. 1964), human capital theory (Becker 1975), and teaching models in entrepreneurship for higher education (Bécharde and Grégoire 2007, 2005b). The applied framework overcomes several trending points of concern in the literature on the impact of EE including the over-reliance on models of entrepreneurial intentions, overlooking, among others, the details of EE design and delivery in the evaluations performed. This novel evaluation framework puts forward the triad of cognitive, skill-based and affective outcomes of EE in the domain of education, and the triumvirate objective outcomes: employability, intrapreneurship and private early-stage entrepreneurial activity (EA) in the domain of entrepreneurship. It conceptualises experiential EE through the prism of demand and competence teaching models, while traditional EE is viewed as analogous of a supply model (ibid 2007).

This study focuses on two small, open neighbouring post-transition economies: Estonia and Latvia. The analysis applies a mixed methods embedded design by combining multiple case study, cross-sectional and comparative designs. Data were collected from 16 entrepreneurship educators and from 559 final year bachelor students participating in business-related programmes, and recent graduates from these programmes taught at 8 local HEIs (4 per country). Purposive expert and homogeneous sampling were employed, respectively, at the qualitative and quantitative data collection stages that involved face-to-face semi-structured interviews and an online survey. The interview data were used to diagnose the prevailing form of intervention at each HEI. The survey data were used to test the hypotheses. Content analysis by means of data coding was performed to process the qualitative data. The structural equation modelling was applied to estimate cognitive, skill-based and affective outcomes. The analysis of co-variance was used

to determine if statistically significant differences exist between predominantly traditional and experiential teaching and their learning outcomes. In addition, various regression models were run to estimate the association between learning outcomes and objective outcomes as well as between experiential EE and objective outcomes.

The findings of the study question the common assumptions mentioned earlier, having brought partial support for the principal hypotheses. Experiential EE was associated with higher skill-based and affective outcomes than traditional EE, but only in Estonia. The analysis indicated that the experiential form of intervention does not necessarily lead to higher levels of learning outcomes – in some cases even being associated with adverse effects; and that other factors (e.g. prior entrepreneurial aspirations, attitudes to educators) exhibit a significant influence on these outcomes. Affective outcomes acted as a consistent predictor of graduate employability, private early-stage EA as well as increasing the propensity of graduates to engage into nascent intrapreneurship. However, none of the objective outcomes showed the hypothesized dependency upon cognitive and skill-based learning outcomes. As far as the objective expressions of entrepreneurial behaviour were concerned in the period of the study, it did not matter significantly whether entrepreneurship was studied traditionally or experientially in Estonia, and the attendance of more experiential EE even tended to be less beneficial in Latvia. These results were largely divergent from conventional wisdom within human capital theory implying that investments in entrepreneurship-related human capital assets do not quite meet the expectations in the given context.

The discussion of the results advances our understanding of why experiential EE might not work as expected. The findings are appraised from the viewpoint of entrepreneurship pedagogy, external factors affecting the development of local EE as well as other dimensions pertaining to EE design, delivery and the transfer of learning in the two countries. In particular, I find pertinent the intervention volume, the pedagogical and entrepreneurial experience of educators, the learning habits of students, coherence among teaching aims, methods used and outcomes expected as well as government support, and the availability of EE infrastructure, among other contextual influences. The dissertation concludes with recommendations for educators and decision-makers at HEIs, prospective students, policy makers in charge as well as EE scholars. Overall, this work contributes to topical debates in EE research with novel theoretical, methodological and empirical results.

TIIVISTELMÄ

Tässä väitöskirjassa tartutaan kahteen nykyisen yrittäjyyskoulutustutkimuksen vähäiselle huomiolle jääneeseen teemaan. Ensimmäkin on vain vähän vertailevaa tutkimusta yrittäjyyskoulutuksen eri muodoista, esimerkiksi perinteisen ja kokemuksellisen yrittäjyyskoulutuksen välisistä eroista, jonka avulla voitaisiin testata laajalti hyväksytyä käsitystä siitä, että kokemuksellinen yrittäjyyskoulutus on tehokkaampi tapa saavuttaa haluttuja tuloksia oppijoissa. Toinen ongelma on näytön vähäisyys siitä, miten yrittäjyyden objektiivinen ilmeneminen itsensä työllistämisenä tai palkkatyössä riippuu yrittäjyyskohtaisista kompetensseista, joita voidaan kehittää yrittäjyyskoulutuksella. Näiden puutteiden korjaamiseksi tässä väitöskirjassa rakennetaan ja testataan yrittäjyyskoulutuksen tulosten arviointiin käytettävää integroitua viitekehystä. Se perustuu käsitteellisesti Bloomin osaamisen tason määrittelyyn liittyvään taksonomiaan (Kraiger et al. 1993; Bloom et al. 1964), teoriaan inhimillisestä pääomasta (Becker 1975) ja korkea-asteen yrittäjyyskoulutuksessa käytettäviin opetusmalleihin (Bécharde ja Grégoire 2007, 2005b). Käytetty viitekehys auttaa korjaamaan useita, tällä hetkellä alan kirjallisuudessa tunnistettuja ajankohtaisia ongelmia, jotka liittyvät esimerkiksi niihin vaikutuksiin, joita yrittäjyyskoulutuksen liiallinen yrittäjyysintentioihin perustuvien mallien hyödyntäminen aiheuttaa sekä siihen, että arvioinneissa ei useinkaan huomioida yrittäjyyskoulutuksen suunnittelun yksityiskohtia ja toteuttamista. Yrittäjyyskoulutuksen uudenaikaisessa arviointiviitekehyksessä korostuvat yrittäjyyskoulutuksen kolmen osa-alueen tulokset, eli kognitiiviset, osaamiseen perustuvat ja affektiiviset tulokset, sekä yritystoiminnan erilaiset objektiiviset tulokset: työllistettävyys, sisäinen yrittäjyys ja varhaisen vaiheen yrittäjyys. Tutkimus käsitteellistää kokemuksellista yrittäjyyskoulutusta kysyntään ja pätevyyteen liittyvien opetusmallien näkökulmasta samalla, kun perinteistä yrittäjyyskoulutusta tarkastellaan analogisesti tarjontamallin avulla (ibid. 2007).

Tässä tutkimuksessa keskitytään kahteen pieneen ja avoimeen siirtymätalouden jälkeisessä vaiheessa olevaan naapurimaahan: Viroon ja Latviaan. Analysoinnissa käytetään useita menetelmiä hyödyntävää tutkimusmallia, jossa yhdistetään tapaustutkimukseen ja poikkileikkauskyselyaineistoihin perustuvia sekä vertailevia malleja. Tiedot kerättiin 16:lta yrittäjyyden opettajalta ja 559:ltä viimeisen vuoden liiketoiminta-alan korkeakouluopiskelijalta sekä saman koulutusohjelman suorittaneilta vastavalmistuneilta yhteensä kahdeksassa paikallisessa korkeakoulussa (4 kummassakin maassa). Tutkimuksessa käytettiin

harkintaan perustuvaa asiantuntijaotantaa ja homogeenista otantaa laadullisten ja määrällisten aineistojen keräämiseksi teemahaastattelujen sekä verkkokyselyn avulla. Haastatteluaineiston perusteella määriteltiin jokaisen korkeakoulun ensisijainen yrittäjyyden opetusmalli. Tutkimustietoja käytettiin hypoteesien testaamiseen. Laadullinen aineisto analysoitiin sisältöanalyysin avulla. Rakenneyhtälömallintamista käytettiin kognitiivisten, osaamiseen perustuvien ja affektiivisten tulosten arviointiin. Kovarianssianalyysia käytettiin sen selvittämiseen, ilmeneekö ensisijaisesti perinteisen ja kokemuksellisen opetuksen sekä vastaavien oppimistulosten välillä mahdollisesti tilastollisesti merkitseviä eroja. Lisäksi käytettiin erilaisia regressiomalleja oppimistulosten ja objektiivisten tulosten sekä kokemuksellisen yrittäjyyskoulutuksen ja objektiivisten tulosten välillä vallitsevien yhteyksien selvittämiseen.

Tutkimuksen tulokset kyseenalaistavat aiemmin esiintuotuja yleisiä oletuksia ja tukevat osittain pääasiallisia hypoteeseja. Kokemuksellinen yrittäjäkoulutus oli yhteydessä parempiin osaamistuloksiin ja affektiivisiin tuloksiin kuin perinteinen yrittäjyyskoulutus, mutta tämä koski vain Viroa. Tietojen analysointi viittasi siihen, että kokemuksellinen toimintatapa ei välttämättä johda parempiin oppimistuloksiin – ja joissakin tapauksissa vaikutukset voivat olla jopa päinvastaisia; ja että muut tekijät (esim. aiemmat yrittäjyyteen liittyvät tavoitteet, suhtautuminen opettajiin) vaikuttavat merkittävästi näihin tuloksiin. Affektiiviset tulokset puolestaan ennustivat johdonmukaisesti valmistuneiden työllistyvyyttä, varhaisen vaiheen yrittäjyyttä sekä lisäsivät valmistuneiden taipumusta sisäiseen yrittäjyyteen. Mikään objektiivisista tuloksista ei kuitenkaan ollut hypoteesin mukaisesti riippuvainen kognitiivisista ja osaamiseen perustuvista oppimistuloksista. Virossa yrittäjyyskoulutuksen perinteisyys tai kokemuksellisuus ei näyttänyt vaikuttavan merkittävästi yrittäjyyden objektiiviseen ilmenemiseen tutkimusajanjakson aikana, ja kokemuksellisen yrittäjyyskoulutuksen suuremmasta osuudesta näytti olevan jopa vähemmän hyötyä Latviassa. Tulokset poikkeavat suurelta osin inhimillisen pääoman teorian mukaisesta perinteisestä uskomuksesta, ja viittaavat siihen, että investoiminen yrittäjyyteen liittyvään inhimilliseen pääomaan ei vastaa täysin odotuksia tässä kontekstissa.

Tulosten arviointi lisää ymmärrystämme siitä, miksi kokemuksellinen yrittäjyyskoulutus ei välttämättä toimi odotetulla tavalla. Löydöksiä arvioidaan yrittäjyyspedagogiikan ja paikalliseen yrittäjyyskoulutukseen kohdistuvien ulkoisten vaikutusten näkökulmasta sekä muiden yrittäjyyskoulutuksen suunnitteluun, toteuttamiseen ja siirtovaikutukseen liittyvien dimensioiden kautta näissä kahdessa maassa. Olennaisia tekijöitä ovat erityisesti toimintatavan laajuus, opettajien pedagogiikkaan ja yrittäjyyteen liittyvä kokemus, opiskelijoiden

oppimistavat, opetuksen tavoitteiden yhtenäisyys, käytetyt menetelmät ja odotetut tulokset sekä valtion tuki ja yrittäjyyskoulutukseen liittyvän infrastruktuurin saatavuus sekä muut asiayhteyteen liittyvät vaikutukset. Väitöskirjassa annetaan suosituksia korkeakoulujen opettajille ja päätöksentekijöille, potentiaalisille opiskelijoille, poliittisille päättäjille sekä yrittäjyyskoulutuksen tutkijoille. Tämä tutkimus antaa oman panoksensa ajankohtaiseen yrittäjyyskoulutustutkimukseen esittelemällä uusia teoreettisia, metodologisia ja empiirisiä tuloksia.

KOKKUVÕTE

Käesolev väitekiri täidab kaht olulist lünka kaasaegses ettevõtlushariduse uuringute valdkonnas: esiteks, ettevõtlushariduse eri vormide, näiteks, traditsiooniline ja kogemuspõhine ettevõtlusõpe, võrdlevate uuringute puudumine, millega kinnitaks laialt levinud väidet, et kogemuspõhine ettevõtlusharidus on soovitud õpitulemuste saavutamisel tõhusam, ja teiseks, tõendite puudumine selle kohta, kuidas ettevõtluskäitumise objektiivsed väljendused ettevõtjate ja palgatöötajate puhul olenevad ettevõtluspädevustest, mida ettevõtlusõpingute käigus arendatakse. Nende lünkade täitmiseks väitekirjas pakutakse välja ja testitakse ettevõtlusõppe õpiväljundite integreerivat hindamisraamistikku, mis tugineb Bloomi õppe-eesmärkide taksonoomiale (Kraiger jt 1993; Bloom jt 1964), inimkapitali teooriale (Becker 1975) ja ettevõtluse õpetamismudelitele kõrghariduses (Bécharde ja Grégoire 2007, 2005b). Kohaldatav kontseptuaalne raamistik lahendab mitu ettevõtlushariduse valdkonna kirjanduses välja toodud valupunkti, sealhulgas, ülemäärane tuginemine ettevõtluskavatsuste mudelitele, mis muuhulgas ei võta hindamisel arvesse ettevõtlusõppe kavandamise ja teostamise üksikasju. Uudne hindamisraamistik esitab ettevõtlusõppe kognitiivsete, oskuspõhiste ja afektiivsete õpiväljundite kolmikmudeli ettevõtlushariduses ning selle objektiivsed tulemused edasises tööalases konkurentsivõimes, ettevõttesiseses ja isiklikus ettevõtlustegevuses. Selles mõtestatakse kogemuspõhine ettevõtlusharidus läbi nõudluse ja pädevuse õpetamise mudelite prisma, traditsioonilist ettevõtlusharidust vaadeldakse aga pakkumismudeli analoogina (*ibid* 2007).

Uuring keskendub kahele väikesele üleminekujärgsele avatud majandusega naaberriigile: Eestile ja Lätile. Analüüsis kombineeritakse mitme juhtumi uuringu, läbilõike- ja võrdlusmeetodeid. Andmed koguti kaheksa (nelja Eesti ja nelja Läti) kohaliku kõrgkooli 16-lt ettevõtluse õppejõult ja 559-lt viimase aasta bakalaureusetudengilt, kes osalesid äriiga seotud õppekavades, ning nende õppekavade hiljutistelt lõpetajatelt. Kvalitatiivsete ja kvantitatiivsete andmete kogumine toimus poolstruktureeritud silmast-silma-vestluste ja veebipõhise küsitlusena, kasutati vastavalt ettekatsetud ekspert- ja homogeenset valimit. Vestlustes kogutud andmete põhjal tuvastati, millist õppetöö meetodit erinevates kõrgkoolides peamiselt kasutatakse. Küsitluse andmeid kasutati hüpoteeside testimiseks. Kvalitatiivsed andmed kodeeriti nende sisu analüüsimiseks. Kognitiivsete, oskuspõhiste ja afektiivsete õpiväljundite (omavaheliste) statistiliste

seoste analüüsiks kasutati struktuurse modelleerimise meetodit. Kovariatsioon-analüüsiga selgitati, kas peamiselt traditsioonilise ja kogemuspõhise õpetamise ja vastavate õpitulemuste vahel on statistiliselt olulisi erinevusi. Peale selle hinnati mitmesuguste regressioonimudelite abil traditsioonilise ja kogemuspõhise õppe väljundite ning ettevõtluskäitumise objektiivsete näitajate vahelisi seoseid.

Uuringu tulemused seavad kahtluse alla eespool osutatud tavapärased eeldused ning kinnitavad osaliselt põhihüpoteese. Kogemuspõhine ettevõtlusharidus seostus traditsioonilisega võrreldes paremate oskuspõhiste ja afektiivsete tulemustega, kuid seda ainult Eestis. Analüüs näitas, et kogemuspõhine õppimisvorm ei anna alati paremaid õpitulemusi ja mõnel juhul seostub see isegi negatiivse mõjuga ning tulemusi mõjutavad oluliselt ka muud tegurid (nt. eelnevad ettevõtluspüüdlused, suhtumine õppejõududesse). Afektiivsed õpiväljundid ennustavad lõpetajate konkurentsivõimet tööturul, algusjärgu isiklikku ning samuti ettevõttesisest ettevõtlust. Ükski ettevõtlikkuse objektiivne näitaja ei kinnitanud aga hüpoteesis oletatud sõltuvust kognitiivsetest ja oskuspõhistest õpitulemustest. Mis puudutab ettevõtluskäitumise objektiivseid väljendusi uuringuperioodil, siis ei olnud Eesti puhul erilist vahet, kas ettevõtlust õpiti traditsiooniliselt või kogemuspõhiselt, ning Läti puhul osutus kogemuspõhisemas ettevõtlushariduses osalemine isegi vähem kasulikuks. Need tulemused erinevad suurel määral inimkapitali teooria tavaarusaamast ja näitavad, et ettevõtlusega seotud inimkapitali tehtud investeeringud ei täida kõnealuses kontekstis päriselt ootusi.

Uurimistulemuste arutelu annab parema arusaama sellest, miks kogemuspõhine ettevõtlusharidus ei pruugi anda oodatud tulemusi. Uurimistulemusi hinnatakse ettevõtluspedagoogika ning kohaliku ettevõtlushariduse arengut mõjutavate väliste tegurite seisukohast, samuti muude mõõtmete seisukohast, mis on seotud ettevõtlusõppe kavandamise ja pakkumisega ning õpitu ülekandega kahes riigis. Muude mõjurite seas võib esile tuua õpingute mahu, õppejõudude pedagoogilised ja ettevõtluskogemused, tudengite õpiharjumused, õppe-eesmärkide sidususe meetodite ja oodatavate tulemuste vahel, samuti riigipoolse toetuse ning ettevõtlushariduse infrastruktuuri olemasolu. Väitekirja lõpus antakse soovitudes kõrgkoolide õppejõududele ja otsustajatele, tulevastele üliõpilastele, poliitikakujundajatele ja ettevõtlushariduse valdkonna uurijatele. Kokkuvõtteks annab väitekirja uudsete teoreetiliste, metodiliste ja empiiriliste tulemuste näol panuse ettevõtlushariduse uurimisvaldkonna aktuaalsete küsimuste arutelusse.

TABLE OF CONTENTS

ABSTRACT	7
TIIIVISTELMÄ	9
KOKKUVÕTE	13
1 INTRODUCTION: ENTREPRENEURSHIP AND EDUCATION	21
1.1 Definitional framework	23
1.2 Emergence and development of entrepreneurship education	27
1.2.1 Theoretical basis of EE.....	30
1.3 Research gaps	37
1.4 Research objectives	40
1.5 Design of the study.....	44
1.6 Structure	46
PART I: THEORY	
2 TEACHING AND LEARNING ENTREPRENEURSHIP	51
2.1 Learning theories in education and psychology	51
2.1.1 Behaviourist learning.....	55
2.1.2 Cognitivist learning	58
2.1.3 Constructivist learning.....	59
2.2 Teaching models in entrepreneurship for higher education	61
2.2.1 Supply model.....	64
2.2.2 Demand model.....	68
2.2.3 Competence model	67
2.3 Experiential nature of entrepreneurial learning	73
2.3.1 Reflection on the best-fit teaching model.....	76
3 OVERVIEW OF ENTREPRENEURSHIP EDUCATION IMPACT STUDIES	79
3.1 “The teachability dilemma” of entrepreneurship	80
3.2 A selection and critical review of EE impact studies	84
3.2.1 Quantitative studies	85
3.2.2 Qualitative studies	98
3.2.3 Systematic reviews and meta-analyses.....	101
3.3 Impact of activity-based learning in other disciplines.....	105
3.4 Is the target anything an intervention happens to hit?.....	107

4	EVALUATING THE OUTCOMES OF ENTREPRENEURSHIP EDUCATION – THE INTEGRATIVE FRAMEWORK.....	111
4.1	Entrepreneurial competences as learning outcomes of EE.....	112
4.1.1	Bloom’s taxonomy, types of learning and competences	113
4.1.2	Human capital theory and competences	119
4.2	Objective outcomes of entrepreneurship-related human capital investments	121
4.2.1	Employability	122
4.2.2	Intrapreneurship.....	124
4.2.3	Private early-stage entrepreneurial activity	126
4.3	Teaching model	128
4.4	Towards the integrative framework.....	129
4.4.1	Study hypotheses	133

PART II: PRACTICE

5	METHODOLOGY	141
5.1	Context: Estonia and Latvia, post-transition countries.....	142
5.2	Quantitative and qualitative study projects	147
5.2.1	Types of research design	148
5.3	Sampling and data collection procedures	154
5.3.1	Purposive sampling	155
5.3.2	Semi-structured interviews with entrepreneurship educators.....	158
5.3.3	Survey of entrepreneurship students and graduates	160
5.3.4	Addressing possible sampling biases in the survey.....	164
5.4	Key measures.....	166
5.4.1	Interview protocol	166
5.4.2	Survey instrument.....	167
5.5	Methods and tools for the data analysis	174
5.5.1	Qualitative study project.....	174
5.5.2	Quantitative study project.....	175
6	QUALITATIVE DATA ANALYSIS AND RESULTS	179
6.1	Definitions of entrepreneurship.....	179
6.2	Findings from the Estonian sample	180
6.2.1	HEI A: John and Jill	180
6.2.2	HEI B: Rob and Richard.....	187
6.2.3	HEI C: Leo and Hannah	192
6.2.4	HEI D: Maria and Matthew	197
6.2.5	Prevailing form of intervention	200
6.3	Findings from the Latvian sample.....	201
6.3.1	HEI E: Chris and Sarah	201
6.3.2	HEI F: Aaron and Alex	204

6.3.3 HEI G: Jack and Dan.....	208
6.3.4 HEI H: Patricia and Sander	213
6.3.5 Prevailing form of intervention	217
6.4 Main takeaways.....	218
7 QUANTITATIVE DATA ANALYSIS AND RESULTS	223
7.1 Cross-checking the prevailing form of intervention.....	223
7.2 Estimation of EE outcomes	226
7.2.1 Learning outcomes	226
7.2.2 Objective outcomes	232
7.3 Testing the hypothesized linkages and drawing inferences	235
7.3.1 Correlation between the learning outcome types: testing H1a-H1c.....	235
7.3.2 Mediation between cognitive and affective outcomes: testing H2.....	236
7.3.3 Comparison of learning outcomes: testing H3	240
7.3.4 Connecting learning outcomes and objective outcomes: testing H4–H6....	258
7.3.5 Comparison of objective outcomes: testing H7.....	278
8 CONCLUSIONS AND DISCUSSION.....	285
8.1 Empirical findings and contributions	286
8.1.1 Constructs of learning outcomes	288
8.1.2 Practices of entrepreneurship educators: teaching models in action.....	289
8.1.3 Forms of educational intervention vis-à-vis learner outcomes.....	293
8.1.4 Associations between learning outcomes and objective outcomes	297
8.2 Theoretical and methodological contributions	300
8.3 Limitations of the study.....	303
8.4 Practical implications and recommendations	307
8.4.1 For educators and decision-makers at HEIs: EE design and delivery.....	308
8.4.2 For other EE stakeholders	315
REFERENCES	319
ANNEXES.....	349
Additional information on data collection.....	349
Extra details of statistical analysis.....	374
THE AUTHOR’S PUBLICATIONS AND CONFERENCE PRESENTATIONS.....	411
CURRICULUM VITAE OF THE AUTHOR	413

LIST OF FIGURES

Figure 1.	Manifestations of entrepreneurship.....	26
Figure 2.	Flow chart of search, selection, and screening journal papers for the review ..	86
Figure 3.	The integrative framework for evaluating the outcomes of EE and the study hypotheses.....	132
Figure 4.	Teaching models at Estonian HEIs by dimension	200
Figure 5.	Teaching models at Latvian HEIs by dimension	218
Figure 6.	Correlation between the learning outcome types in Estonia and Latvia.....	236
Figure 7.	Testing the mediation relationship between knowledge and affection	238
Figure 8.	Initial level of knowledge about entrepreneurship and perceived cognitive outcomes of EE	248
Figure 9.	Initial level of entrepreneurship experience and perceived skill-based outcomes of EE	249
Figure 10.	Initial level of entrepreneurial career aspirations and perceived affective outcomes of EE	250
Figure 11.	Comparison of perceived cognitive outcomes by form of intervention.....	253
Figure 12.	Comparison of perceived skill-based outcomes by form of intervention	254
Figure 13.	Comparison of perceived affective outcomes by form of intervention	255
Figure 14.	Quadrants for selecting the basic teaching strategy	309

LIST OF TABLES

Table 1.	The tasks, research questions (RQ) and study projects (SP) in the monograph	45
Table 2.	Paradigms and approaches to learning in education, psychology, and philosophy.....	54
Table 3.	Major paradigms of learning and its features.....	57
Table 4.	Dimensions of teaching models in EE.....	65
Table 5a.	Selected EE impact studies	87
Table 5b.	Overview of EE impact studies by type of research and measures with details	94
Table 6.	Bloom’s taxonomy and its adaptation by Kraiger et al.....	115
Table 7	Fisher et al.’s (2008) theoretical categorisation of EE learning outcomes	118
Table 8.	Specifications of the objective outcomes of EE.....	126
Table 9.	Methodological aspects of the study.....	149
Table 10.	Main criteria for research quality per type of design employed in the study projects (SPs).....	153
Table 11.	Descriptive information about the Estonian and Latvian samples of educators	161
Table 12.	Descriptive information about the sample of students and graduates.....	163
Table 13.	Main topics addressed in the interviews	167
Table 14.	The educational outcome items self-assessed by the respondents using a 5-point Likert scale	172
Table 15.	Summary of key variables	173
Table 16.	“Entrepreneurship is...”	181
Table 17a.	Pedagogical aims set and outcomes expected by John and Jill.....	182
Table 17b.	Pedagogical aims set and outcomes expected by Rob and Richard.....	188
Table 17c.	Pedagogical aims set and outcomes expected by Leo and Hannah	192
Table 17d.	Pedagogical aims set and outcomes expected by Maria and Matthew	198
Table 18a.	Pedagogical aims set and outcomes expected by Chris and Sarah	202
Table 18b.	Pedagogical aims set and outcomes expected by Aaron and Alex	205
Table 18c.	Pedagogical aims set and outcomes expected by Jack and Dan	209
Table 18d.	Pedagogical aims set and outcomes expected by Sander and Patricia.....	214
Table 19a.	Frequencies of exposure to different teaching methods in the Estonian sample	224
Table 19b.	Frequencies of exposure to different teaching methods in the Latvian sample	225
Table 20.	Results of the CFA for the learning outcome constructs	227
Table 21.	Cronbach’s alphas for the affective outcome subscales.....	231

Tables 22a–c. Descriptive and correlation matrixes for the nascent intrapreneurship II items	233
Tables 23a–c. Descriptive and correlation tables for the employability items	234
Table 24. The discriminant validity test.....	237
Table 25a. The mediating effect of cognitive on affective outcomes in Estonia.....	239
Table 25b. The mediating effect of cognitive on affective outcomes in Latvia	239
Table 26. Results of testing H1 and H2	240
Table 27. Significant predictors of the affective outcome components.....	251
Table 28. Results of the Kruskal-Wallis test: supporting the learning outcomes	256
Table 29. Results of testing H3.....	257
Table 30a–b. Results of the Kruskal-Wallis test: supporting the objective outcomes	259
Table 31. General descriptive statistics of the regression variables	260
Table 32a–b. Correlation matrixes of the regression variables	261
Table 33. Types of paid employment among the Estonian and Latvian graduates ...	263
Tables 34a–b. Effects of the learning outcomes on graduate employability.....	264
Tables 35a–b. Effects of learning outcomes on nascent intrapreneurship I.....	267
Tables 36a–b. Effects of learning outcomes on nascent intrapreneurship II.....	270
Tables 37a–b. Effects of learning outcomes on private early-stage EA	275
Table 38. Results of testing H4–H6.....	277
Table 39a–b. Number of graduates involved in entrepreneurial and intrapreneurial activities per HEI	278
Table 40. Descriptive statistics for the dependent variables by type of EE intervention	279
Table 41. Effects of intervention type/HEI on graduate employability	280
Table 42. Effects of intervention type on nascent intrapreneurship I.....	281
Table 43. Effects of intervention type on nascent intrapreneurship II.....	282
Table 44. Effects of intervention type on private early-stage EA.....	283
Table 45. Results of testing H7.....	284

1 INTRODUCTION: ENTREPRENEURSHIP AND EDUCATION

Can entrepreneurship be taught and learnt? This question is obsolete. Entrepreneurship can be experienced (Kuratko 2005; Drucker 1985).

Entrepreneurship has been historically relevant for explaining economic growth through employment generation, increased productivity, innovation and social welfare (Reynolds et al. 2014; Baumol and Strom 2007). Under conditions of perpetual economic, social and geopolitical uncertainty, and the growing complexity of the modern world, entrepreneurship in the XXI century has become even more topical and forceful as a possible way of tackling on-going challenges. It objectively pervades our lives and society: everyday consumption, internet and mobile communication, news and travel agencies, insurance and banking, and charities and non-government organisations. The vast majority of mundane activities constituting human life are driven by one's entrepreneurial spirit to create new social or material value, compete and cooperate, transform and develop. Manifested in classical, corporate and more generic behavioural forms (Hytti 2008), entrepreneurship has been recast as a major social force, and method of living and learning (Sarasvathy and Venkataraman 2011).

Due to the strong ties between societal development and interest in entrepreneurship, education is at the forefront as one of the most influential channels capable of triggering long-term changes in society (Kyrö 2006; Landström 2005). The scholarly interest in entrepreneurship education (hereafter referred to as "EE") has expanded exponentially generating increasing numbers of courses, intertwining the diffusion of entrepreneurship into all levels of the education system, and supporting the on-going shift towards more experiential learning for over a decade (Kuratko 2005; Katz 2003; Bruyat and Julien 2000). Apart from being in vogue, nowadays entrepreneurial competences are becoming as important as literacy, and universally applicable to any career path (EU 2006). They are also included among the key critical elements leading to the formation of start-ups, innovations, new market entries through individual and collective

entrepreneurial actions (Wennekers and Thurik 1999). The question of whether entrepreneurship can be taught and learnt is no longer valid (Kuratko 2005) because it has to be. EE is expected to mould entrepreneurial individuals or prospective entrepreneurs firstly by building up knowledge and skills for opportunity recognition and implementation, new product and service development, market mechanisms; and secondly, by developing, among other competences, proactiveness and self-esteem, a positive attitude to failure and risk-taking, and towards entrepreneurialism in general.

What is entrepreneurship and EE in academic terms? Researchers agree on entrepreneurship itself being a heterogeneous and multi-faceted phenomenon (Gartner 2001; Low and McMillan 1988). Given the existing diversity of definitions, and therefore, of research strands, the field is sometimes characterised by “*extensive conceptual confusion and definitional vagueness*” (Moberg 2014:22), which, in turn, causes fragmentation of EE research characterised by the emergence of differing aims and approaches (ibid 2014; Mwasalwiba 2010). Entrepreneurship and EE research have similar development dynamics. They took off around the same time and were pioneered by the same scholars: Jerome Katz, William Gartner, Dale Meyer, David McClelland, among others.

The field of entrepreneurship research with its own boundaries, purposes, and theoretical base in academia started to form in the second half of the XX century, shifting from an economics background towards an interdisciplinary background that also entails psychology, education, sociology, and finally, establishing its own research domain in the XXI century. While the complete legitimacy of the field may still be discussed, especially by representatives of other scientific disciplines, it has arguably become a distinctive area of intellectual enquiry (Shane 2012) with a recognised scientific community and relatively systematic body of theoretical and empirical knowledge accumulated to explain and predict phenomena of interest that other fields do not explain or predict (Shane and Venkataraman 2000).

EE, in turn, was suggested to have reached the status of an independent academic discipline at the end of 1980s (Gorman et al. 1997) and became mature at the beginning of 2000s (Katz 2003). While both statements can be questioned, EE has apparently become an eligible sub-field of entrepreneurship research. The status of EE research as a separate field is debatable due to common boundaries shared with entrepreneurship research. EE may not be considered mature, due to a lack of a sound theoretical base and sharing the solid part of it with entrepreneurship research (Fayolle 2013). “*A partial legitimacy – yes, maturity – no*” as Kuratko posited (2005:587), whilst not much has changed during the last ten years with similar challenges currently faced (Fayolle 2013).

This introductory chapter first of all sheds light on the definitional framework the dissertation pursues. Subsequently elaborating on the emergence and development of EE. Being situated at the junction of entrepreneurship and education research, EE also taps into the science of psychology with respect to personality development. Alongside the state of the development of EE research, the chapter addresses its current preoccupations and major research gaps that this dissertation intends to bridge. Finally, the research objectives and design as well as the structure of the work are presented.

1.1 Definitional framework

Semantically, the word “entrepreneurship” originates from the XII century French verb “entreprendre”, literally meaning “to undertake something” (Kyrö 2004). The very first entrepreneurs were adventurers, who travelled to the “New World” looking for life opportunities without knowing what to expect. In the course of further historical development, the understanding of the entrepreneurship phenomenon evolved around notions of speculation and arbitrage, innovation and creative destruction, resources and value creation, self-employment and venture creation, individual traits and behaviours, individual-opportunity nexus and process (Hortovanyi 2012; Bruyat and Julien 2000; Murphy et al. 2006; Landström 2005; Baumol 1990). Transitions in understanding typically occurred during or following critical changes in economic and societal development, such as the end of feudalism, industrialisation, the breakthrough of electronics as well as the crises in the 1930s, 1970s, 2000s, which stimulated or conditioned a search for new ways to succeed, and better solutions to old and new problems (Kyrö 2006; Landström 2005).

To date, two major alternative approaches to defining the notion of entrepreneurship can be distinguished. The first, established by Shane and Venkataraman (2000), views entrepreneurship as a process of the identification and exploitation of lucrative opportunities. The second, established by Gartner (1985), views entrepreneurship as a process of new firm or venture formation. Respectively, the first research strand strives to explain why, when and how opportunities are created or discovered and exploited; it focuses on the individual, but extends to organisations and general life contexts through the exploitation of opportunities in a given environment. The second aims to explain and facilitate the role of new enterprises in furthering economic progress and focuses on a multi-level research, i.e. industries, organisations, individuals, society.

Shane and Venkataraman's (2000) definition crystallised as a consensus definition for many researchers over the last fifteen years. Other leading scholars follow the second, more "intrinsic", approach (e.g. Reynolds 2009; Davidsson 2006) for the reasons that new firm creation is more consistent with the "true", or classical, meaning of entrepreneurship and can be objectively measured, while the individuals-opportunities nexus is too broad being related to all market participants (Shane 2012). Dimov (2011) also argues against opportunities as the central focus of entrepreneurship research saying that it is intuitive and hard to capture empirically.

Nevertheless, the two dominant tenets are unique to the field and, what is more, can complement each other. Bearing in mind that firm formation is an institutional arrangement and identification-exploitation of opportunities often happens long before that, the latter is apparently more pervasive. As Shane (2012) posits, entrepreneurship can occur through organisational arrangements other than firm formation, and therefore, studying firm formation alone does not provide an objective picture of factors associated with the phenomenon. Entrepreneurial attitude and behaviour can take place in non-organisational settings and be regarded as a prerequisite for classical entrepreneurship or intrapreneurship though not necessarily leading to them (Pinchot 1985; Carsrud and Johnson 1989; Schumpeter 1947)¹.

Venture creation is typically associated with launching a new enterprise, either private or within an existing organisation, but a venture itself can also stand for an individual entrepreneurial project or undertaking carrying personal or social value. The creation of new enterprises, predominantly small, where ownership and management functions are combined, has often been viewed as the "true", or classical, meaning of entrepreneurship since the 1970s. In light of twin oil crises, declining growth rates in Western countries, the globalisation of the world economy, large organisations were no longer considered the main and only source of job creation and economic growth (Kyrö 2006). This was supported by a study by David Birch (1979), who concluded, drawing upon longitudinal data (1969–1976) on 5.6 million US businesses, that the majority of new jobs were created by small often young and independent companies employing 20 or less people. The research also emphasised the importance of rapidly growing firms, so called "gazelles". Although the results of Birch's study failed to be replicated by other

¹ In some sources, particularly in the UK, the term "enterprising behaviour" is used as more generic and broad, referring to personal context and collective enterprise spirit, where entrepreneurship can flourish, while "entrepreneurial" is considered more narrow, referring to business context and setting up a new venture or firm (Gibb 1993). Due to an evidently thin line between "enterprising" and "entrepreneurial", only the latter is exploited in this thesis.

researchers and came under considerable debate, the findings reinforced the association of entrepreneurship with small businesses, and since then they accompany each other along research lines.

In the framework of this dissertation, *entrepreneurship* is a cumulative notion defined as *a context-dependent social and economic process of discovering or creating, evaluating and exploiting novel opportunities by individuals as part of which a new firm or venture can be launched, owned, managed and/or sold, to contribute new value(s) to society, benefit the economy and an entrepreneur* (based on Baron and Shane 2008; Bruyat and Julien 2000; Shane and Venkataraman 2000; Gartner 1985). This overarching contemporary view of entrepreneurship entails the principal ways the phenomenon manifests itself in our lives and society beyond the classical meaning, and reflects its complexity and multi-dimensionality. It provides a common ground for synthesising diverse approaches to understanding the phenomenon co-existing in the field. Figure 1 (elaborated from *ibid* 2008) illustrates the definitional framework pursued. It is especially relevant in the context of EE and assessing its influence because teaching aims are rarely limited to fostering graduate private venture creation.

A critical mind may argue that, strictly speaking, equating general entrepreneurial behaviour, small business ownership and intrapreneurship with entrepreneurship is similar to covering a “hodgepodge” or “potpourri” of concepts under one phenomenon, which blurs the core phenomenon and is unfavourable for strengthening the field (Shane and Venkataraman 2000). However, this definitional framework underlines the research focus of the dissertation on the manifestations of entrepreneurship that can be enhanced through education. It entails not only entrepreneurship expressed as private venture creation, small business ownership and management, but also as intrapreneurship, a way of acting in an organisation and entrepreneurial behaviour per se (Hytti 2008). Therefore, it can be applicable to various contexts and a wide array of EE interventions.

It should be noticed that the classification of small business ownership and management as a form of entrepreneurship (or even vice versa) is still subject to debate. Comparatively recently, Shane (2012) elaborated upon delivering on the promise of entrepreneurship as a field of research. This paper suggestively introduced an even stricter delineation of entrepreneurship from management. Entrepreneurship examines many outcomes, not only business performance, which is a focus of management. Entrepreneurship does not require the existence of firms and can occur before the firms are established in line with the individual-opportunities nexus perspective. It is concerned with identification of opportunities, not sustaining competitive advantage in the first place. Shane (2012)

also suggests that entrepreneurship focuses on individual rather than collective choices, though this might depend on the base definition pursued. The two fields still intersect having common roots in economics and still being interconnected in educational terms at many European business schools and universities (Wilson 2008). Furthermore, management might also be regarded as a function of entrepreneurship or at least as an inevitable part of entrepreneurship as far as the process phases that follow founding a company are concerned.

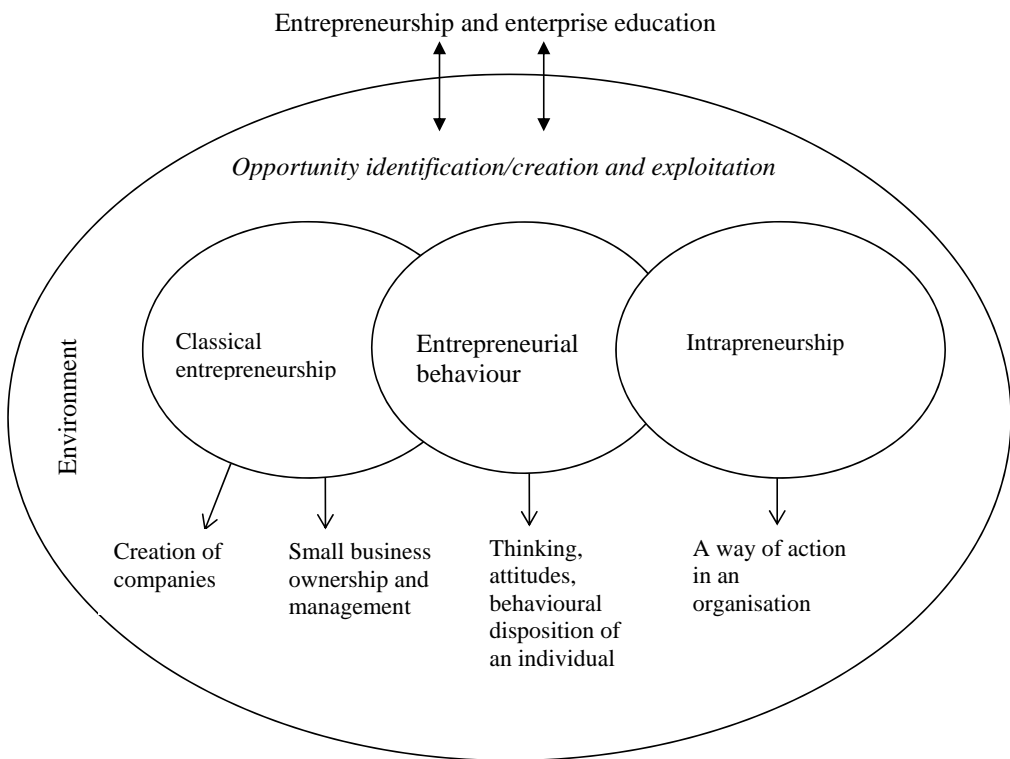


Figure 1. Manifestations of entrepreneurship

For EE and analysing its influence on learners, these principal manifestations of entrepreneurship are crucial in being related to the objectives set and outcomes expected from teaching. Practices of teaching entrepreneurship (including target audiences, content design, teaching methods, etc.), in turn, are directly connected with the nature of the phenomenon, and its understanding in the scientific community and among practitioners (Lackéus 2013; Mwasalwiba 2010).

The most frequently used complementary terms denoting educational interventions in entrepreneurship are “enterprise education” and “entrepreneurship education”. The Quality Assurance Agency for Higher Education in the United Kingdom (2012) offers definitions of the two related terms. “...*enterprise education is defined as the process of equipping students (or graduates) with an enhanced capacity to generate ideas and the skills to make them happen. 'Entrepreneurship education equips students with the additional knowledge, attributes and capabilities required to apply these abilities in the context of setting up a new venture or business.'*” (corporate context including) (QAA 2012: 2)².

“Enterprise education” is commonly accepted in the UK as originally associated with the concept of enterprise developed by Margaret Thatcher in the 1980s that also meant the attitude towards one’s occupation and life, sense of self-sufficiency and self-reliance, active citizenship, capability to deal with uncertainty and positively respond to change, amongst other of its facets (Davies 2002; Heelas and Morris 1992). “Entrepreneurship education” is commonly accepted in the US, where it has been historically geared towards, but no longer limited to, venture creation (e.g. Sarasvathy and Venkataraman 2011; Plaschka and Welsch 1990; McMullan and Long 1987). In reality, educators may implement enterprise and entrepreneurship education simultaneously or a declared approach to teaching might even differ from factual. To avoid a confusion of terms, the use of “entrepreneurship education” follows throughout the dissertation given the broad definition of entrepreneurship it pursues.

1.2 Emergence and development of entrepreneurship education

EE has become an increasingly vital area of research, practice and policy over the last four decades. The growth in the number of entrepreneurship courses and programmes has been extraordinary as has been the growth in scientific publications to explore and explain how EE is implemented, what it should be, who are the target audiences, and what kind of economic and societal aims it should have. Although the first MBA course in the US related to entrepreneurship (“Management of New Enterprises”) was held in 1947 at Harvard University, it is not until the end of the 1960s and beginning of the 1970s that EE officially kicked off. According to Kuratko (2005), this took place in 1971, with an MBA course in

² In view of the notions of attributes and qualities, capabilities and skills often being used interchangeably, this dissertation relies on a systemic competence-based approach drawn from education research, where competences are divided into three groups: cognitive, skill-based, and affective (Kraiger et al. 1993). Chapter 4 presents a deeper discussion on this standpoint.

entrepreneurship launched at the University of Southern Carolina, followed by an undergraduate course in 1972; that is, at the time of the post-modern transition, when entrepreneurship was gradually separating from economics (Kyrö 2006). According to Katz (2003), however, the first contemporary courses in entrepreneurship were introduced at Stanford and New York Universities in 1967³. Since then, entrepreneurship and small business education has been offered in over 1,600 post-secondary institutions in the US alone (Katz 2003). Sources in Europe do not supply directly comparable figures, though, according to Varblane and Mets (2010), entrepreneurship was taught in over 332 institutions across post-Soviet European countries by the end of the first decade of the 2000s. A bibliometric study carried out through Scopus, Science Citation Index and the Social Sciences Citation Index showed a spectacular increase in the number of publications on EE from 3 in 1985 to 124 in 2005, 20% Europe-focused (Rizza and Varum 2011), whereas in 44 top-tier US academic journals 15 papers were published in the 1980s, 37 in the 1990s and 28 in the 2000s (up to 2005) (Kuratko 2005). Nowadays, according to Google Scholar data, the number of papers on EE has multiplied, and the most frequently cited works are published in American and British journals. The exponential growth in the number of EE offerings has gone hand-in-hand with the growth in entrepreneurial activity and entrepreneurship research on both sides of the Atlantic (Katz 2003; Solomon 2007; Wilson 2008; Landström 2005).

In the European Framework for Lifelong Learning, starting from 2006, entrepreneurship is officially regarded as one of the basic life competences (along with mathematical, linguistic, etc.) and as the foundation for all developments required for contributing to society and the economy (EU 2006). In such member states of the EU as the UK, Finland, Sweden, Estonia, and the Netherlands, for instance, EE received strong support in local education policies (e.g. Riigi Teataja 2013; Ministry of Education and Culture of Finland 2009; Gore and Murray 1991). Subsequently, attention towards and investments in EE grow not only from the increasing quantity (number of programmes and courses, educators, projects), but also from upholding and improving the quality (teaching methods, cooperation with enterprises, training of educators, new learning platforms, development of ecosystems). In part, due to this proliferation, the economic contribution of entrepreneurial activities, and the influence the global start-up culture has on our lives, a question, whether entrepreneurship is teachable or not, was considered obsolete (Kuratko 2005). One of the top management scholars, Drucker (1985), did not believe that entrepreneurship was mysterious, having something to do with

³ McMullan and Long (1987) suggest that launching of the very first course, in applied entrepreneurship, which was taught in Japan, can be traced back to 1938.

genes, or suitable only for the “chosen” ones. As any discipline, he posited, entrepreneurship can be learnt. Indeed, when small and medium-sized enterprises (SMEs⁴) produce over half of European GDP (Muller et al. 2014), and HEIs are “blessed” with the growing popularity of entrepreneurship-related programmes, and hence, the demand for them, a priori acceptance of the teachability of entrepreneurship as an educational discipline is both beneficial and convenient.

For an academic field to be distinguishable, several elements are necessary: systematic theory and an established body of literature, a recognised scientific community and authoritative communication sanctions (e.g. renowned outlets), and an occupational career and professional culture (Shane and Venkataraman 2000; Plaschka and Welsch 1990). On top of that, research in any discipline has certain generic purposes and levels of analysis (Low and McMillan 1988). Entrepreneurship and EE research are firmly connected around these elements. The latter tends to reflect and depend upon the processes and preoccupations of the parent field (Fiet 2000a; Garavan and O’Cinneide 1994a), but adding its unique characteristics. For example, entrepreneurship research aims to explain and facilitate the entrepreneurial behaviour of individuals either in private or organisational settings. It also aims to explain the role of new enterprises in furthering economic progress, to facilitate and predict the dynamics of new venture creation. EE research is then concerned with developing the competences required for entrepreneurial activity, and stimulating the respective behaviour of individuals who take responsibility for own lives and personal growth and are able to adequately face uncertainty and manage change in various life situations including venture creation.

Reflecting the current economic and geopolitical trends, the internationalised job market is changing. Creativity, vision, innovation, identification of new opportunities and being able to face the uncertainty inherent in entrepreneurship are becoming valuable in any career choices (Plaschka and Welsch 1990). Yet, although entrepreneurship expands within the global education system, one can rarely find HEI or business schools that provides something called a professional qualification for an entrepreneur (at least in Europe); the same cannot be said about a business administrator or manager.

The existing body of literature is even more important and serves as the litmus test of scientific maturity. Having a systematic theory and authoritative research outlets is interconnected. Bécharde and Grégoire (2005a) attest that EE research for a long time had no central forums to trace its essence. “The International Journal

⁴ SMEs are defined as “businesses, which employ less than 250 staff and have an annual turnover of less than EUR 50 million and/or their balance sheet total is less than EUR 43 million” (Muller et al. 2014:10).

of Entrepreneurship Education” and “The Academy of Management Learning and Education” have been launched only recently. Papers on EE were and still are scattered around entrepreneurship, management and education journals. Some top quality outlets covering these disciplines do not even accept papers on EE. While entrepreneurship and EE research are interconnected, Béchard and Grégoire (2005a) acknowledge that the educational underpinnings of EE research have been largely tacit, and suggest that to strengthen the theoretical base, it should be much more anchored in education sciences than it has been up until now. More recent work by Fayolle (2013) reiterates the lack of theory-driven research and its disconnectedness from education and educational psychology.

1.2.1 Theoretical basis of EE

According to Fiet (2000a), educators do not have much to teach students without proper theory. This idea goes back to Kuhn (1996/1970), who contended theory is the most practical thing one can teach. Fiet (2000b) also argued that the research and teaching agendas of EE should be more theory-driven than descriptive, and educators should integrate research results with theory to make this unity understandable and applicable by students.

Does EE theory exist? It is natural that the content of EE programmes or courses relies on existing entrepreneurship theory in the first place, which is the product of multi-disciplinary efforts and is still being polished (Neck and Greene 2011). The theoretical side of teaching entrepreneurship is backed up by the developments in entrepreneurship research (Fiet 2000a). Its evolution also reflects the changing understanding of entrepreneurs in the scientific community. The pedagogical side of entrepreneurship theory should be informed by the educational approaches involved in linking this theory with teaching and learning as well as by the psychology of learning (Béchard and Grégoire 2005a, 2005b; Fiet 2000b). Hence, it depends on the developments in EE research. Despite the lack of theory-driven studies, educational preoccupations are not completely absent. Moreover, there should be at least practical parallels in EE between the theoretical perspectives drawn from entrepreneurship and education research (Béchard and Grégoire 2005a). The conceptual grounds of entrepreneurship pedagogy, however, have been somewhat limited to a few basic frameworks that are also open to further empirical testing.

What are those theories that determine the content of the EE programmes or courses, and what is entrepreneurship pedagogy based on at present? Neck and Greene (2011) contend there are the known worlds of the entrepreneur, process,

and cognition in EE, and the new frontier of entrepreneurship as a scientific method. Some of the dominant theories from entrepreneurship research that inform teaching practices are presented below along the lines of these worlds. The list is by no means exhaustive. Then, dominant frameworks in entrepreneurship pedagogy are introduced led primarily by Béchard and Grégoire (2007; 2005a).

The world of the entrepreneur

The first world is the world of entrepreneur-heroes, who possess a set of specific traits and competences that make those entrepreneurs more fortunate than other people. This world is backed up by the attribution theory (McClelland 1961) of social psychology and the human capital theory of labour economics (Becker 1975; Lewis 1954; Smith 1776). Two other complementary theoretical perspectives specified by Low and McMillan (1988) are the strategic adaptation perspective, which suggests that the decisions of individual entrepreneurs are key to entrepreneurial success, and the population ecology perspective, which suggests that environment selection procedures are more important than individual goal-driven behaviour. The strategic adaptation perspective, unlike the human capital theory, leaves less space for meaningful educational interventions because inborn talents are more powerful than education. Hence, becoming an entrepreneur is a largely predetermined scenario irrespective of EE (Ronstadt 1987).

The world of process

The second world, that of process, links back to the fields of economics and management/business administration. For many years, linear process methods based on a set of sequentially planned activities (e.g. business, marketing, financial planning) were a hallmark of management as well as entrepreneurship courses since they have common roots (Solomon et al. 1994; Plaschka and Welsch 1990). Led by the logics of causation, prediction, and risk-avoidance, business planning served as “the academic heart” of education in entrepreneurship during 1980s and 1990s, and which also tended to cover the entire scope of business administration (Kuratko 2005). Later, the business modelling approach took over (Osterwalder 2010), but the principle of linearity remained active that applies equally well to teaching strategies based on venture creation stages or to case studies of existing or previous business models to copy patterns of success or reduce the risk of failure (Neck and Greene 2011).

The simultaneous process (occurring over time and dynamic) that has been accredited as distinctive for entrepreneurship – discovery or creation of opportunities – is also often presented as linear, consisting of the exploration, exploitation, and recognition phases (Brush et al. 2003), and serving as the basis for the general theory of entrepreneurship (Shane 2003). Indeed, the conceptualisation of entrepreneurship by Shane and Venkataraman (2000) was rooted in the individual entrepreneurial behaviour from the viewpoint of economics (e.g. Kirzner 1997, Schumpeter 1934), which required outperforming other market participants, also by seeing novel, more profitable combinations of resources, and subsequently, mathematical rules that guided entrepreneurs to optimise within a given means-ends framework (Shane 2003). The key point of differentiation was that it allowed the correctness of conjectures to be uncertain and decisions to be erroneous; it asserted that the process of entrepreneurial discovery was creative and intelligent, plugging in the risk-ignorance, prior knowledge and experiences of an individual (ibid 2003). Therefore, the theory also opened options for researching the non-linearity, uncertainty and irrationality of the entrepreneurship process, and to no lesser extent, exploring those through the world of cognition ruled by psychology.

In a similar vein, Honig (2004) came up with a model of contingency-based business planning that links strategic management and Piaget's theory of learning to the preparation of potential entrepreneurs. This work contributed to the conceptual background of experiential EE ahead of the evolved world of cognition and of the new world of entrepreneurship as method. Positioned as an antidote to traditional pedagogy ill-suited to developing entrepreneurial knowledge and skills that could be applied in a real-life environment, experiential business planning connects action learning and the resulting sense-making.

The world of cognition

In the world of cognition, the world of thinking and doing, researchers are focused on the cognitive processes of individuals such as decision-making to engage in entrepreneurial activity and become more successful entrepreneurs (Neck and Greene 2011). The theory of planned behaviour and social cognitive theory, among others, helped predict and explain entrepreneurial behaviour relying on such psychosocial determinants as attitude towards autonomy and challenges, entrepreneurial self-efficacy, perseverance, creativity and intentions (van Gelderen et al. 2008; Krueger et al. 2000). Once orientation towards opportunities is regarded as "*the heart of entrepreneurship*" (Krueger 2003:113), researchers attempt to

answer the good old question raised by economists, why some people are more likely to notice and pursue certain lucrative opportunities than others, through the lenses of cognitive psychology. One of the possible answers is the pattern recognition perspective offered by Baron (2006), which concentrates on cognitive frameworks that were constructed as a result of prior knowledge, experience, background, and that determine how and why individuals “connect the dots” being alert to particular options.

Krueger (2003) came forward with a systematic work on the cognitive psychology of entrepreneurship unifying what is already known in the field about the modelling of intentions, decision-making, perception, and other processes of the human mind cognitive science is preoccupied with. Although largely focused on affective and conative aspects of mental activity (Hilgard 1980), Krueger’s works on entrepreneurial cognition have become increasingly valid over the last two decades. Researchers often ask, “How do people think entrepreneurially?” (Neck and Greene 2011), while an alternative question, “How do people feel entrepreneurially?” might not be less relevant to subsequent behaviour and even more relevant for unlocking or moulding the entrepreneurial personality.

During the last decade, the linear analytical approaches were challenged by the power of creativity, imagination, irrationality, emotions, intuition and non-linear logics, which appear more suitable for entrepreneurship characterised by uncertainty and ambiguity (ibid 2011; Kirby 2004). Even before the cognition world grew in popularity, Sexton and Upton (1987) suggested that education should also engage students in similar conditions to develop their ability to manage mental processes (including coming up with original thoughts and making sustainable decisions) under the reality constraint (Solomon et al. 1994). A more dynamic approach to learning has become particularly relevant with the recognition of the importance of the mind and its irrational processes; hence, teaching methods that invoke both thinking and doing, such as simulations, scripting, teamwork and opportunity identification come into play (Neck and Greene 2011). Within the pattern recognition perspective, for instance, Baron (2006) suggested entrepreneurship students should be exposed to studying pertinent factors related to technology, markets, demographics, and other related fields to track changes in trends, dynamics, facts and figures, and to derive new senses by learning to see connections that are not obvious. Information is the key, coupled with exposure to a broad range of experiences, like prototyping, studying exemplars, and other forms of doing, according to Baron (2006).

The cognition world presumably developed in response to the traits approach failure and to the doubts in the universality of the linear process world. Advances

in scientific knowledge about (successful) entrepreneurs revealed that they indeed think and work differently than other people (ibid 2000; Baron 1998). Entrepreneurs are often forced to work in new and unpredictable conditions, under severe time constraints; they are committed to their own ventures to an extreme degree, and therefore, are emotionally attached. This makes them rely mostly on heuristics as well as being likely to be more susceptible to various psychological biases, such as over-confidence and over-optimism in judgements either about themselves or the external environment (Baron 1998). Gradually, education has been given more credit and power to influence people choosing the entrepreneurship as a career path, to equip them with the required competences, and to develop from novices into experts (Krueger 2003).

The world of method

The world of entrepreneurship as method fully embraced the possibility of teaching the discipline to all students from lower to higher levels of the educational system, because it asserts that anyone can become a successful entrepreneur. Sarasvathy and Venkataraman (2011) positioned entrepreneurship as a scientific method of the XXI century as a large social force, similar to democracy in the XVIII and Bacon's scientific method in the XVII centuries (similar proposition can be found in Fiet 2000a). The world of method is an antidote to the linear process in the sense that the latter assumes known inputs and known outputs, it is predictable, consists of sequential steps, whereas entrepreneurship is unpredictable, full of contingencies, with a lot of things shaping up "on the go" (Neck and Greene 2011). Teaching entrepreneurship as a method requires equipping students with skills and tools to think and tackle any problems entrepreneurially, or effectually (Sarasvathy 2001). Effectuation is considered to be a dominant logic in the method world as an alternative to experimentation in scientific method. Contrary to causation, where means are given and goals predetermined, effectual decision-making relies only on some means, where the individual-level means, such as own tastes, abilities, knowledge corridors, are primary to achieving the imagined ends (ibid 2001). An effectuator does not know where the path leads, since the result cannot be predetermined; in other words, the future is uncertain (ibid 2001). Embodying mechanisms of the entrepreneurship method are a portfolio of techniques to encourage creation; for example, starting business as part of coursework, contingency-based business planning, games and simulations, reflections, and strategies to manage uncertain and ambiguous processes, to control an unpredictable future (e.g. affordable loss, bricolage, stakeholder involvement,

continuous iterations) (Neck and Greene 2011; Baker and Nelson 2005; Honig 2004; Sarasvathy 2001).

Pedagogical frameworks for entrepreneurship

Exploring the worlds of entrepreneur, process, cognition, and method underpinned the theoretical side of teaching entrepreneurship and a few pedagogical aspects of entrepreneurship theory. While most of the underlying theories were indeed borrowed from other disciplines and integrated into entrepreneurship reality within the known facets of it, empirically approved theoretical bases upon which to build pedagogical models and methods are lacking (Fayolle 2013; Kuratko 2005). As it has been for a long time with the parent field, there is yet no unifying theory of EE. Béchar and Grégoire (2005a) examined the main educational preoccupations of EE research from 1984 to 2001 based on 112 papers, and found that at that time over 60% were focused on the teaching content with a link to economics and business administration. Only a few explored the psycho-cognitive processes of individuals including prior knowledge, experience, learning abilities, and their socio-cognitive counterpart such as the development and implementation of authentic learning environments (ibid 2005a). The works of Honig (2004) and Löbner (2006) are among exemplary contributions in this arena. Nowadays, more young scholars are working in the niche (e.g. Lackéus, Moberg, Hägg). One stark and clear way of improving the theoretical completeness of EE is to strengthen its pedagogical foundations.

A solid contribution to developing the pedagogical side of entrepreneurship can be attributed to Béchar and Grégoire (2007; 2005b), who proposed an analytical framework of three archetypical teaching models – the supply, demand, and competence models – in applications to EE. As discussed in the next chapter, these models are backed up by mainstream learning paradigms – behaviourism, cognitivism, and constructivism/social constructivism (Kyrö 2005) – and coincide with the three basic modes of EE – education *about*, *through* and *for* entrepreneurship – often used to categorise educational interventions (Mwasalwiba 2010; OECD 2009; Hytti et al. 2004). This division is widely accepted in EE research with some variations (Hannula and Pajari-Stylman 2008; Gibb 2005; Hytti et al. 2004). The supply model (related to education *about* entrepreneurship) focuses on transmission of information. The demand model (related to education *through* entrepreneurship) focuses on developing entrepreneurial personalities. The competences model (related to education *for* entrepreneurship) focuses on training entrepreneurs.

Béchar and Grégoire's (2005b) framework is one of the four prominent contributions to entrepreneurship pedagogy along with the models by Fayolle and Gailly (2008), Kyrö (2008), and Alberti et al. (2004). However, applicable activities that develop one's mind to become entrepreneurial in line with the existing frameworks is a topic for further exploration. In this light, Béchar and Grégoire's teaching models are more detailed and prescriptive because they come with a set of compatible aims and outcomes, methods of teaching and assessment along with an ontological setup. The framework is especially useful for classifying pedagogical innovations or interventions and in considering contextual factors at the levels of institutions and education system (Béchar and Grégoire 2007). In spite of its soundness and research advantages, this framework has not been widely recognised and applied by other EE scholars. In as much as it makes the theory base less fragmented and backs up empirical research, this is quite surprising.

Fayolle and Gailly's (2008) framework is somewhat similar to Béchar and Grégoire's in distinguishing between ontological and educational level dimensions corresponding to the key questions – why? (objectives), what? (contents), how? (methods), for whom? (target audiences), for which results? (evaluation), what does EE mean, what does education mean in the context of entrepreneurship, and what are the roles of educators and students? While there is “*no universal pedagogical recipe for how to teach entrepreneurship*”, the choice of EE methods should rely upon its adequacy for objectives, audiences, content and context (Fayolle and Gailly 2008: 580). Likewise, the model by Alberti et al. (2004) comprises six key inter-related components: pedagogies, goals, contents, assessment, educators and audiences.

The theoretical framework for teaching and learning entrepreneurship introduced into EE by Kyrö (2008) is based on three parts of the human mind (Hilgard 1980) and Ruohotie and Koironen's (2000) taxonomy of individual difference constructs. The framework suggests three domains emerging in the process of interaction between personality and intelligence – affection (temperament and emotions, including attitudes), conation (volition and motivation, including self-efficacy) and cognition (declarative and procedural knowledge, where the first refers to the memorable knowledge of facts, concepts, figures and the way learners link them together, but the second denotes their abilities to apply the knowledge acquired, i.e. skills).

The theoretical and pedagogical bases of EE are still in the process of development, and it is often in the hands of educators to choose how to teach and engage students, and what theories to apply. Pedagogy is also changing based on the growing demand for EE. From the theoretical perspective, the extensive focus

of EE research on the content taught is nowadays becoming better balanced with pedagogical preoccupations to which the evaluation of the impact of EE belongs. Béchard and Grégoire (2007:281) advise that the greatest challenge for entrepreneurship educators is “*less one of legitimacy, and more and more one of quality*” of the outcomes of EE. Understanding the educational impact informs the technology of education (e.g. instructional design, systemic approach to teaching); it also relates to the psycho-cognitive and socio-cognitive counterparts of learning (Béchard and Grégoire 2005a). How can entrepreneurship programmes be designed, delivered and evaluated to improve and maintain the quality of interventions? What is the impact of prior competences on entrepreneurial learning? What is the influence of interactions with educators or other EE stakeholders on student learning? How can we measure the contribution that EE taught at university level offers our society and economy? These are some of the questions Béchard and Grégoire (2005a) inspired EE scholars to address.

1.3 Research gaps

As a curricular, and increasingly often compulsory, discipline, entrepreneurship faces distinct generic and specific challenges.

“*The more we study, the more we know. The more we know, the more we forget. The more we forget, the less we know. So, why study?*” This ironic quote by an anonymous author unveils *two general layers of discussions* concerning the relationship between students and the education system: 1) *to what extent does education enable them with competences benefiting and required in working life;* 2) *what teaching approach should be pursued so as to ensure effective learning relevant for one’s professional life.* Though applicable to all disciplines, these questions do have special allure in EE research. On the one hand, EE secures policy and financial support in many European countries (e.g. Finland, United Kingdom, Estonia, Netherlands, Sweden, and Denmark); multiple educational and human resources are being channelled towards implementing EE-related pedagogical innovations. On the other hand, pay-offs from these educational initiatives remain opaque. The higher the rigour of studies devoted to measuring the EE impact, the less evident it is that EE produces the desired outcomes (Rideout and Gray 2013) and the more evident that the positive impact is overestimated (Martin et al. 2013).

The first generic layer of discussion leads to the selection of entrepreneurship-specific metrics for evaluating the outcomes of EE. According to Blenker et al. (2014), considering the major bets policy makers, educators and managers of HEIs place on supporting and expanding EE, it comes as no surprise that the

measurement of the returns, in other words, the impact or outcomes of EE, is the largest category of studies in EE research at present. The stakeholders, including the students and their parents, collectively invest in entrepreneurship-related human capital development with expectations of future returns. *The second layer of discussion* calls for explicit comparisons between different forms of interventions in entrepreneurship such as traditional and experiential in order to find a coherent combination of didactic, pedagogical and environmental/contextual choices. How to teach, to whom, what goals to target and what resources to employ is an integral task for educators and researchers to solve when designing EE interventions. More detailed problematisation of these discussion lines follows.

At present, two broad groups of measures dominate the EE impact research: 1) subjective measures; for example, self-efficacy and attitudes, skills and knowledge, formed in the education domain and referred to as perceived “learning outcomes” or “competences”, and 2) objective measures; for example, nascent entrepreneurial behaviour, number of established enterprises, as well as the related performance indicators traceable in the entrepreneurship domain. In line with human capital theory, individuals with higher levels of learning outcomes should achieve better outcomes in professional life than those with lower levels (Becker 1975). While this is a generally accepted standpoint behind investments into EE in general and into experiential EE in particular, most studies focus on either the first or the second group of measures (Martin et al. 2013; Rideout and Gray 2013). Moreover, objective outcomes are less frequently examined and often limited to the aforementioned measures, omitting such crucial objective expressions of entrepreneurial behaviour as intrapreneurship and employability. The relationship between the two broad groups of measures in a wider sense also tends to be underexplored. How individual-level competences acquired through EE relate to employability, intrapreneurship and private entrepreneurial activity among graduates remains a hot question. The dependence of objective outcomes on learning outcomes rests at the level of theoretical assertions in the mainstream literature, alongside the superiority of the outcomes associated with experiential EE interventions.

“Entrepreneurship is neither a science nor an art. It’s a practice.” Drucker contended back in 1985 (p. 30). In view of the discipline’s applied nature and along with a shift in the dominant learning paradigm towards social constructivism (Kyrö 2005), a learner-centred experiential approach to teaching entrepreneurship has gained major recognition among renowned scholars (e.g. Krueger 2007; Löbler 2006; Fiet 2000b). The uncertainty and ambiguity, action and dynamism inherent in the essence of the discipline make experience-based pedagogy that is supposed

to engender the flux of action, reflection and creation among learners, imperative for EE (Dewey 1998/1938; Kolb 1984). In turn, a teacher-centred traditional approach equivalent to education *about* entrepreneurship as opposed to education *through* and *for* entrepreneurship (Gibb 2005; Hytti et al. 2004) is considered less suitable for developing the discipline-specific competences. An implicit standpoint behind the growing popularity of experiential EE is its expected potential to generate superior outcomes, either subjective or objective, in comparison to traditional EE. However, the outcomes of different forms of EE such as traditional and experiential have not been widely addressed in recent research. The existing studies devoted to assessing the impact of EE tend to focus on the outcomes of entrepreneurship and non-entrepreneurship students and/or to pursue longitudinal designs irrespective of the form of intervention (e.g. Fayolle and Gailly 2013; Graevenitz et al. 2010; Charney and Libecap 2000). Despite widespread recognition of the experiential approach to teaching entrepreneurship as more appropriate and fertile than the traditional approach, this assertion is not supported by sufficient empirical evidence.

Working on these major gaps, links directly to Béchard and Grégoire's (2005a) questions on the quality of EE outcomes. To acquire new knowledge and skills as a result of EE courses might not be enough to generate the expected outcomes in the domain of entrepreneurship. The factors of the quality of the entrepreneurial competences acquired and their transfer into real life come into play. The objective outcomes are exemplary in this discussion because they indicate whether business schools and universities indeed affect the job market significantly; that is, whether they fulfil their ultimate goals by educating knowledgeable and entrepreneurial individuals as well as entrepreneurs.

In light of the on-going discussion about how entrepreneurship should be taught, Fiet (2000b), Löbler (2006), Krueger (2007) and other prominent scholars affirm that students should be engaged, committed to the learning progress, and practice and reflect on their practices a lot. This suggests the demand and competence models, education *through* and *for* entrepreneurship, are the most appropriate. Yet, can students appreciate and benefit from the world of entrepreneurship as method, if they do not have already developed analytical and linear thinking skills? Is experiential learning universally the best for all types of audiences and conditions?

As Blenker et al. (2014:706) point out, the apparent dominance of empirical material from Anglo-Saxon countries in EE research may have led to an "*unwarranted generalization of findings from these contexts*". To provide a counterweight to this geographical research gap, it might be useful to focus on

countries with a different socio-cultural background and economic history. In this light, the countries that underwent transition from a planned to market economy provide an interesting context in which to analyse EE.

The present monograph seeks to narrow the identified research gaps by investigating the relationships between different groups of EE outcomes – subjective and objective – and by assessing the outcomes of different forms of EE, namely, traditional and experiential. In doing so, it proposes and applies the novel integrative framework that conceptually leans on Bloom’s taxonomy of educational objectives (Krathwohl 2002; Kraiger et al. 1993; Bloom et al. 1964), human capital theory (Becker 1975), and teaching models in entrepreneurship for higher education (Béchar and Grégoire 2007, 2005b).

1.4 Research objectives

Located at the crossroads of education, labour economics and entrepreneurship, this research venture sets forth the following objectives:

- to examine patterns in associations between:
 - the learning and objective outcomes of EE,
 - experiential and traditional forms of EE and the two types of outcomes at bachelor level in Estonia and Latvia (post-transition Baltic countries);
- based on the obtained findings, to work out recommendations for the design and delivery of EE to facilitate enhanced entrepreneurial learning among bachelor students and graduate entrepreneurship in the researched context.

The monograph strives to contribute to contemporary debates and challenges in EE research with theoretical, methodological, and empirical novelties by revisiting the topic of the evaluation of the outcomes of EE that already has several hundreds of studies in stock. Nevertheless, significant gaps remain to be bridged.

Developing the integrative theoretical framework for evaluating the outcomes of EE can offer a fruitful way towards a systemic understanding of the operational specifics of various interventions in entrepreneurship and the outcomes associated with them (Béchar and Grégoire 2005a,b). In a university or business school setting, the whole system of dimensions entailing the interaction of didactics (e.g. teaching aims, content, target groups), pedagogy (e.g. teaching methods and tools), and context (environment, infrastructure) makes up an educational intervention (Blenker et al. 2008; Fayolle and Gailly 2008; Béchar and Grégoire 2005b). By empirically analysing the system’s components in detail, this work adds to the empirical evidence on how different characteristics and the interaction of the dimensions converge into the main teaching archetypes in EE: supply, demand and

competence models (ibid 2007). The analysis also provides new insights into “*the adequacy between methods used and audience specificities, methods and contents, methods and institutional constraints*” (Fayolle 2013:5). The monograph will particularly focus on how the specifics of EE design and delivery that determine the prevailing form of intervention relate to the educational and entrepreneurship-level outcomes. EE design refers to curricular decisions including teaching aims, content, and composition of study groups; EE delivery refers to teaching and assessment methods, and the learning environment.

This research endeavour is one of the first to explicitly compare the outcomes associated with experiential and traditional EE. There certainly are multiple ways to implement experiential EE given the diversity of the branches of experience-based pedagogy; for example, work, project, practice or problem-based learning (Hynes et al. 2011; Lee et al. 2010; Nab et al. 2010). Prior to delving deeper into the effects of different sub-types of experiential learning, this work argues it is essential to tackle the identified gap at the level of dichotomy first. It conceptualises experiential EE through the prism of demand and competence teaching models, where traditional EE is viewed as an analogue of a supply model (Béchar and Grégoire 2005b). By gaining empirical insights into these impacts within the integrative framework, the research addresses the aforementioned questions posed by Béchar and Grégoire (2005a) to fellow EE scholars.

In addition, the study responds to the call for empirical evidence on “*who entrepreneurship educators are and what they really do in their interventions*” (Fayolle 2013:4). Do the educators have to possess experience in entrepreneurship to ensure the acquisition of transferrable competences among students, and do they have it (ibid 2013; Béchar and Grégoire 2005a). Increasing attention has been paid to developing the competences of entrepreneurship educators in the European community since 2011, when “The Budapest Agenda: Enabling Teachers for Entrepreneurship Education” was adopted. Several lifelong training initiatives for educators were commenced (e.g. CONEEECT, CB Entreint), with the aim of refocusing their entrepreneurship teaching practices towards a more experiential approach, facilitation and new forms of assessment; to grow an entrepreneurial educator (EC 2011; Heder et al. 2011). However, in spite of these initiatives, rather limited evidence can be found either in the scientific literature or the latest pan-European studies about current practices among entrepreneurship educators.

In developing the integrative framework, the monograph draws special attention to the education-level outcomes of EE. Approaches to assessing the learning outcomes vary but most studies rely on cognitive psychology theories such as the theory of planned behaviour or social cognitive theory, and related subjective

measures widely applied in previous research: entrepreneurial attitudes, self-efficacy and intentions (e.g. Boyd and Vozikis 1994; Krueger and Dickson 1994). Rather than using measures that already saturate the EE impact research, this study employs the tripartite competence framework of learning outcomes, which originates in the science of education (Krathwohl 2002; Kraiger et al. 1993) and was brought into the EE context by Fisher et al. (2008). The key advantage of this framework is its holistic consideration of the principal learning domains, namely, cognitive, skill-based and affective, and the respective outcomes (Krathwohl 2002; Bloom et al. 1964). The study sheds novel light on the learning outcomes by refining Fisher et al.'s (2008) measures and revalidating the tripartite framework using structural equation modelling.

Besides the triad of the learning outcomes, the novel integrative framework puts forward the triumvirate of the objective outcomes constituting employability, nascent intrapreneurship and the private early-stage entrepreneurial activity (EA) of graduates. Thereby, the study attempts to compensate for disproportionately fewer top-notch papers researching objective outcomes than subjective outcomes to its immediate importance for economic and societal growth. This is what typically interests policy makers in the first place and objectively differentiates the field from other disciplines in higher education. Building upon the basic premise of human capital theory, the dissertation is among the first to test associations between the entrepreneurial competences formed in the domain of education and the objective expressions of entrepreneurial behaviour in the domain of entrepreneurship. The rich primary data underlying the analysis is expected to serve as a useful basis for the thought-provoking discussion on the linkages between EE and entrepreneurship in its broad contemporary meaning.

This study lends itself to two neighbouring, small and open, post-transition economies located in the Central Baltic region: Estonia and Latvia. Comparing the outcomes of traditional and experiential teaching is becoming more challenging over time mainly due to the on-going shift towards experiential EE in Europe triggered at the policy level (EC 2013). Although changes do not happen immediately, especially in research-dominated European universities, post-transition economies like Estonia and Latvia can serve as a reliable albeit contextual source of data with more distinct variation between the two forms of intervention. In 2013, total early-stage entrepreneurial activity (TEA, including nascent entrepreneurs and new businesses less than 3.5 years old) was the highest in Europe in these countries amounting to 13% (Krumina and Paalzow 2014). Knowing that the share of young people in TEA accounted for 30–40% and that local entrepreneurs were more likely to have received training in entrepreneurship

than non-entrepreneurs (Martinez et al. 2010), one could reasonably assert that entrepreneurial activity can be at least to some extent attributable to EE in these post-transition countries. At the same time, the Estonian and Latvian HEIs did not have a ready infrastructure for EE, including equipped pre-incubators, prototyping factories, regular access to student start-up funding, and so on, as is the case in the established international hubs for experiential EE like Twente, Chalmers or Aalto, for instance. The post-transition context therefore made it possible to assess the outcomes of experiential learning under the conditions of the lack of a specialised institutional support framework for EE. This made the chosen empirical setting even more topical to research.

As far as the choice of level and type of education in the study is concerned, EE is a more pronounced and regular activity that is easier to capture empirically in formal higher education – business schools and management faculties of universities – than informal educational initiatives such as homeschooling, self-teaching, and courses for lifelong learners or occasional boot camps. Higher education in general, and not only EE, is a core investment young applicants and/or their parents make. The bachelor level in this light is crucial since it marks the beginning of one's path in higher education. Graduating with a bachelor's diploma from an HEI is an important milestone in most cases equal to obtaining permission to enter working life. Quality EE should increase the odds of young graduates to become early-stage entrepreneurs either in paid or self-employment, and boost one's entrepreneurialism in any life setting. Therefore, the results of this study may be of interest not only to entrepreneurship educators, researchers, and policy makers, but also to future students as the main customers of higher education.

Beyond the contribution to academic debates and methodological challenges, this monograph aims to generate practical recommendations and derive possible implications that would benefit a number of EE stakeholders. First and foremost, for the educators and study programme directors in charge of designing and delivering interventions, since the work touches upon the effectiveness and efficiency of EE, analyses what worked, what did not and why. Secondly, for policy makers as the findings can also suggest what kind of support is most beneficial for EE development and for enhancing its efficiency. Thirdly, the results can help students, who have strong prior aspirations towards entrepreneurship as a career path, make more informed choices about their future alma maters. Finally, for EE scholars to move the research frontiers forward by addressing the identified gaps in other contexts and ways, and by overcoming the limitations of this study.

1.5 Design of the study

The present monograph raises the following research questions revolving around evaluation of the impact of EE as the main focus of this study:

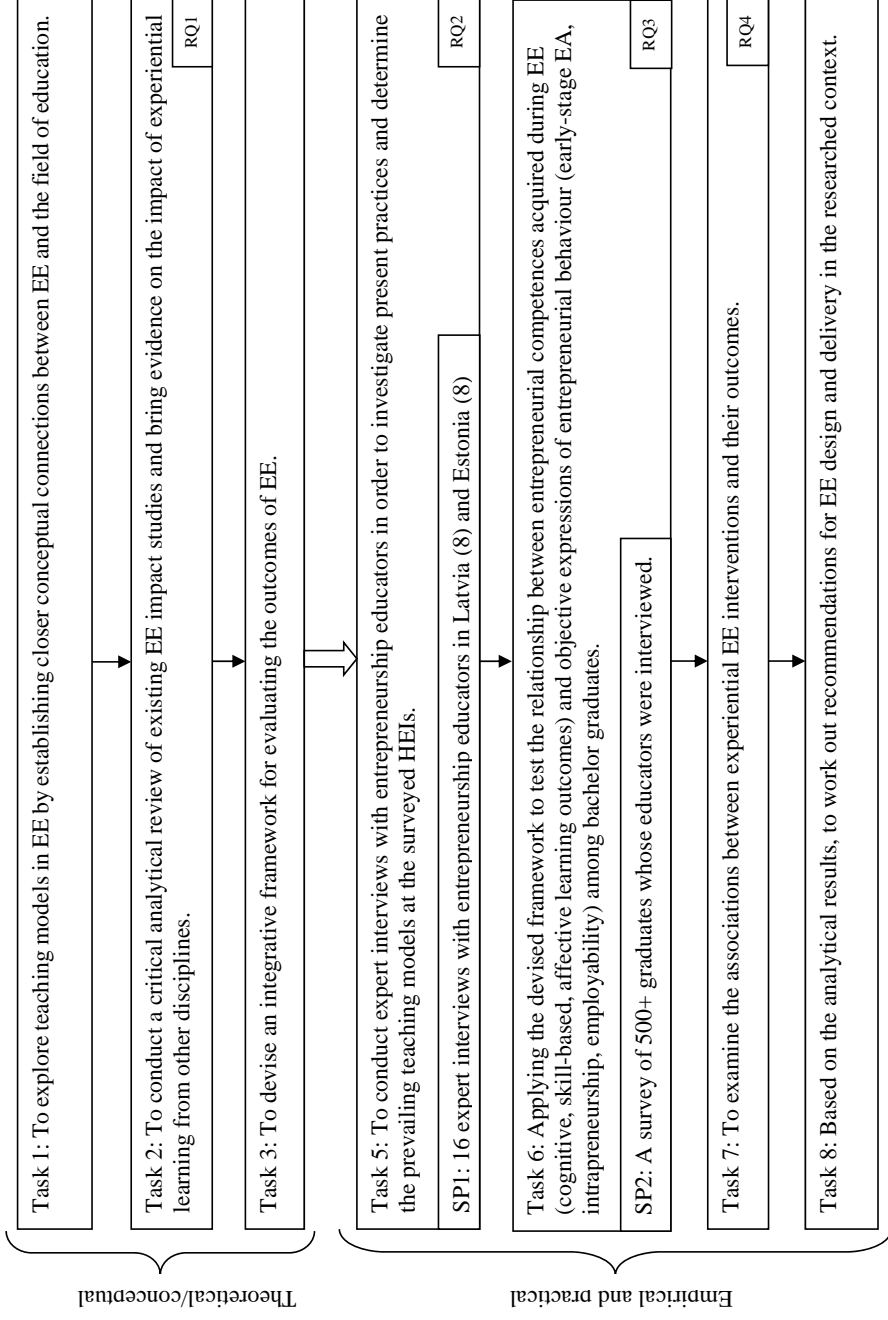
1. What is already known and yet unknown about the outcomes of experiential EE from previous studies? How does the evidence of the impact of experiential learning from other disciplines inform our knowledge? What challenges for educators and researchers does this unveil?
2. What are the present practices among entrepreneurship educators (aims, methods of teaching and assessment, environment, etc.) in formal EE at the bachelor level in Estonia and Latvia?
3. What is the relationship between the entrepreneurial competences acquired as a result of EE (cognitive, skill-based and affective outcomes) and the objective expressions of entrepreneurial behaviour (employability, nascent intrapreneurship, private early-stage EA)?
4. How do the teaching practices of educators in the competence and demand-competence models (i.e. experiential EE) relate to the outcomes of bachelor graduates if contrasted with the supply model (i.e. traditional EE)?

These questions are accompanied by a number of research tasks and two study projects as Table 1 below illustrates.

There are two principal lines of testable propositions: a) experiential EE is associated with higher levels of the learning and objective outcomes of graduates than traditional EE; b) the objective outcomes of EE are positively dependent on the learning outcomes.

The analysis applies a mixed methods embedded design by combining multiple case study, cross-sectional and comparative designs. Data were collected from 16 entrepreneurship educators and from 559 final year bachelor students participating in business-related programmes, and recent graduates from these programmes taught at 8 local HEIs (4 per country). A purposive expert and homogeneous sampling were employed, respectively, at the qualitative and quantitative data collection stages that involved face-to-face semi-structured interviews and an online survey. The survey data was used to test the hypotheses. It was ascertained that a non-response does not interfere with the results. Respondents' admittance to a certain HEI was not directly linked to purposefully selecting into either traditional or experiential EE that was a compulsory part of the bachelor programmes.

Table 1. The tasks, research questions (RQ) and study projects (SP) in the monograph



The key measures were extracted from EE literature on the tripartite competence framework (e.g. Lackéus 2013; Fisher et al. 2008) and from various sources on entrepreneurship outcomes (e.g. Urbano and Turro 2013; Bosma et al. 2012). The respondents retrospectively assessed perceived changes in the levels of knowledge and skills attributable to EE using a range of items, and indicated their level of agreement with statements related to affective outcomes. Intrapreneurship was measured as nascent involvement in new venture or product creation for an employer. Private early-stage EA was expressed through nascent and new enterprise ownership as well as other forms of self-employment. The measure of employability was an 8-item index specifically constructed for this study.

Content analysis by means of data coding was used to process the qualitative data and diagnose the prevailing type of EE intervention at each HEI. Structural equation modelling was used to estimate the cognitive, skill-based and affective outcomes, and analysis of co-variance to determine if significant differences exist between the predominantly traditional and experiential teaching and their educational outcomes. In addition, various regression models were run to estimate the association of the learning and objective outcomes of EE.

1.6 Structure

The monograph is organised as follows. Besides the current introduction and the resulting conclusions and discussion, it comprises two parts. The first part is devoted to the theoretical background of the study and consists of Chapters 2, 3 and 4. The second part is devoted to the practical part and includes Chapters 5, 6 and 7. Every chapter intends to add new theoretical, empirical or methodological insights in line with the research objectives, questions and tasks outlined above.

Chapter 2 summarises dominant paradigms and theories drawn from the psychology of learning and education that back up the archetypical teaching models in EE. It presents an adapted version of Bécharde and Grégoire's (2007, 2005b) framework for teaching entrepreneurship in higher education, and proposes the working definition of experiential EE for the purposes of this research project.

Chapter 3 presents a critical review of the academic literature on the EE impact studies with a special emphasis on experiential interventions. It starts by elaborating on the debates that concern "the teachability dilemma" of entrepreneurship. The overview of the main findings from the top-notch quantitative and qualitative research follows. Then, insights on the impact of activity-based learning from other disciplines are discussed. In light of this

research, the chapter points out specific knowledge gaps and challenges for entrepreneurship educators and researchers.

Chapter 4 is a culmination of the theoretical part of the monograph. It synthesises and develops principal standpoints from the previous chapters in devising the integrative framework for evaluating the outcomes of EE, and formulating the study hypotheses.

Chapter 5 presents the research methodology explaining and justifying the choice of the research strategy, types of design and sampling, operationalisation of variables, methods and tools of data analysis.

Chapters 6 and 7 are fully devoted to the empirical findings of the study. Chapter 6 presents, summarises and compares expert interview insights of how entrepreneurship is taught in the Estonian and Latvian HEIs. Chapter 7 quantitatively estimates the outcomes of EE, tests the hypothesized linkages in the two countries and draws respective inferences.

Chapter 8 concludes on the obtained results, critically discusses and attempts to explain the outputs of the study. It emphasises the empirical, theoretical and methodological contributions to EE research as well as providing a critical account of the study's limitations. Further, this chapter generates practical recommendations for EE design and delivery for entrepreneurship educators and decision-makers at HEIs in the post-transition context. It discusses possible practical implications for policy makers, prospective students as well as outlines potential directions of further research for EE scholars.

PART I:
THEORY

2 TEACHING AND LEARNING ENTREPRENEURSHIP

The evolution of the scientific understanding of teaching and learning processes finds comparable reflections in the science of education, the psychology of learning as well as philosophy. Having undergone a number of paradigm shifts, this understanding now impacts EE and shapes contemporary teaching practices at universities and business schools (Kyrö 2005). The aim of this chapter is to explore the EE teaching models of Béchard and Grégoire (2007; 2005b) by establishing closer conceptual connections between EE and the field of education. The dimensions of the models presented here feed into the integrative framework that guides the research project. This background is logically crucial for the analysis and interpretation of the empirical material from SP1. The chapter initially identifies the difference between teaching and learning in a wider sense, and looks at the theories that form the current prevailing learning paradigms. Secondly, it explores the established teaching models in EE consistent with the learning paradigms and their application to teaching entrepreneurship, and defines experiential EE. Thirdly, it elaborates on the experiential nature of entrepreneurial learning and the teaching model considered the most appropriate for EE in mainstream literature.

2.1 Learning theories in education and psychology

Teaching and learning are inherent processes in our lives that bring the achievements and failures shaping our personalities. Humans are being taught and start learning in early childhood through guidance from their elders and their own experiences alike. Learning is a complex lifelong process of acquiring new or reinforcing existing knowledge, skills, attitudes, behaviours, values or preferences (Hoy et al. 2013; Schacter et al. 2009). Teaching, in turn, is an intentional activity aimed at bringing about learning by imparting those competences, behaviours, values, etc. from a teacher to a learner. It can take the form of standard instruction, training, coaching or consultancy, facilitation or mentoring depending on the epistemological position implicitly or explicitly accepted as a basis (Müller and Dienesberg 2011; Kyrö 2005; Hirst 1971).

Training is a service that addresses personality, character, and related personal competences, above standard teaching or lecturing that aims to impart information. Coaching is a highly individualised service, which in addition to training also provides selected guidance and advice, for instance, when starting new companies – about resources, decision-making, problem solving, goal achievement and performance enhancement. Consultancy is a process that above all addresses the material and decisional aspects of an activity (e.g. starting up a company) (Müller and Diensberg 2011). Facilitation is used to help groups of learners develop processes that are effective in order to accomplish desired outcomes. Mentoring is an informal one-to-one style or form of teaching based on rapport, whereby mentors act as senior co-participants and hold personal interest in the learning process (Wild et al. 1999).

Education (either formal or informal) in that system of notions represents a unifying process encompassing both teaching and learning as well as studying that mediates the two (Pitkäniemi 2009; Uljens 1997). While learning may occur with or without teaching, the latter becomes meaningful only if it ties into the former as far as the nature of the relationship between the two phenomena is concerned (Pitkäniemi 2009). For this reason, dissertations or research papers touching upon education quite often deal with learning theories primarily and then discuss teaching approaches consistent with them (e.g. Hoy et al. 2013; Mueller 2012; Izquierdo 2008; Sackney and Mergel 2007). Depending on the teaching approach pursued and the degree of self-regulation of learning that students are capable of, the relationship between teaching and learning can be either congruent or incongruent, constructive or destructive (Vermunt and Verloop 1999).

There are three main perspectives on learning, or paradigms, that are commonly distinguished in the literature – behaviourism, cognitivism, and constructivism (at a later stage, social constructivism) – encompassing various minor theories developed from the beginning of industrialisation in the XVIII century to the post-modern period in the XX century (see, for example, Kyrö 2005). Theories are a systematic body of knowledge that make it possible to explain and predict processes or phenomena. Models are simplified representations of reality. A framework is a broader concept entailing theories, models, concepts and methods. A paradigm is a fundamental aggregation of trusted frameworks, accepted patterns in scientific knowledge as well as agreed philosophical bases (Sackney and Mergel 2007; Kyrö 2006, based on Kuhn 1996; Choi 1993). They form as a result of the development of scientific understanding, intensive discourse into the dynamics of the phenomenon, and the appearance of differing and justified theories that precede this formation. Each paradigm constitutes certain kinds of ontological, axiological

and epistemological positions; that is, ideas of how reality is constructed, what is considered valuable in this reality, and how knowledge about it can be acquired (Kyrö 2008). While each paradigm is unique and different from others, they are at the same time complementary reflecting the evolution of scientific thought, where the more novel attempts to bridge gaps in its predecessor.

Behaviourism maintains that learning occurs as a result of a change in behaviour achieved through repetition, where “good” or correct actions are praised and “bad” or erroneous actions are discouraged (Woolfolk and Hoy 2013). This paradigm emphasises Aristotelian and Darwinist truth, accepting that any behaviour can be observed, measured, and changed (Kyrö 2005). Behaviourists believe that responses to environmental stimuli shape behaviours; hence, internal cognitive processes are of little or no concern (Woolfolk and Hoy 2013; Sackney and Mergel 2007).

Cognitivism stands on the power of human cognition and rationalism, positing that behaviour is a consequence of the thought process (ibid 2007; Kyrö 2005). Therefore, unlike behaviourists, followers of this paradigm view learning as a process dependent on rules and algorithms of mental function. This process is located inside a person and consists of a constant relation of new information to previously acquired (Woolfolk and Hoy 2013). “*Cogito ergo sum*” – the famous philosophical expression of Descartes – accords well with the standpoints of this paradigm.

Constructivism is a relatively modern learning paradigm based on the premise that individuals construct their own reality, deriving sense and meaning from events and activities through individual experience (ibid 2013; Sackney and Mergel 2007). Learning is a process, where individuals always have to be active and take responsibility for their own development and progress. To a large extent, this process is shaped by prior knowledge, mental structures and the beliefs of the learners (Woolfolk and Hoy 2013). *Social constructivism* is a logical continuation of the constructivist paradigm applied in social settings, where knowledge is constructed by groups of learners for one another, and learning comes as a result of the interaction of an individual with groups. It stands on the centrality of social and cultural contexts in learning (Hoy et al. 2013).

The philosophy of education, in its turn, concentrates on two basic approaches – objectivist and constructivist – to thinking and learning as well as to instructional design (Cronjé 2006; Jonassen 1991). Objectivism supposedly matches the behaviourist and part of the cognitivist paradigm. It asserts that reality exists objectively and independently of individuals perceiving it, knowing and learning are processes for representing and mirroring reality (Jonassen 1991). Hence, logical

reasoning is a way to understand this reality; objective knowledge and truth are possible (Carson 2005). Constructivism, on the other hand, matches the constructivist and social constructivist as well as, partly, the cognitivist paradigm and assumes that knowing and learning are processes for interpreting and constructing individual knowledge representations (Carson 2005; Jonassen 1991). Therefore, logical reasoning is not the only means of understanding reality – musical, spiritual, spatial, inter-/intra-personal and other ways of knowing also play their part; knowledge and truth are subjective and relative to an individual or community (Carson 2005; Cronjé 2006; Jonassen 1991). For the purposes of this dissertation, the author is not delving deeper into such branches of educational philosophy as idealism, realism, scholasticism, and others, rather sticking to the two basic approaches rooted in the consecutively formed philosophies.

Table 2. Paradigms and approaches to learning in education, psychology, and philosophy

<i>Philosophy of education</i>	<i>Psychology of learning</i>	<i>Paradigms of learning</i>
Objectivist approach	Behaviourism	Behaviourist paradigm
Constructivist approach - Cognitive focus - Cultural/social focus	Cognitivism	Cognitivist paradigm
	Self-regulated learning	Constructivist paradigm
		Social constructivist paradigm

The psychology of learning as a theoretical science maintains three basic approaches consistent with the objectivist and constructivist approaches in philosophy – behaviourism, cognitivism, and self-regulated learning. Behaviourism encompasses theories of operant conditioning, classical conditioning and neo-behaviourism. Cognitivism entails gestalt theory, social learning theory and cognitive development theory (Skinner 1953). Self-regulated learning is based on the premise of control and responsibility over one's own learning, comprising activity theory, praxeology and humanism, among others (Skinner 1953; Mueller 2012). Therefore, it falls under the constructivist approach in the philosophy of education as well as constructivist and social constructivist learning paradigms. De facto, the learning theories that transformed into these paradigms originated from psychology (though can be traced back to Greek philosophers), and reflect a major shift in explaining learning from the behavioural towards the cognitive angle, where cognition is a keystone of both cognitivism and constructivism (Jonassen 1991). To avoid a confusion of terms from psychology, education and philosophy,

the approaches, traditions, and paradigms in question are mapped relative to one another in Table 2.

Having briefly described what key learning paradigms exist and how they are reflected in/coincide with the approaches dominant in the philosophy of education and psychology of learning, the sub-chapter proceeds with a more detailed overview of the key theories upon which the three paradigms are built so as to discuss their application and implications for teaching entrepreneurship. Table 3 based on Woolfolk and Hoy (2013), Mueller (2012), Kyrö (2008), Sackney and Mergel (2007), and Kyrö (2005) serves as the guiding map.

2.1.1 Behaviourist learning

Stimulus-response principles are at the core of the behaviourist learning paradigm grounded in empiricism, an epistemological position stating that knowledge and truth are deducted from experience, observation, and experiment (Kyrö 2005). The origins of the paradigm can be traced back to Aristotle (384–322 B.C.E.) and the concept of the mind as a “tabula rasa” filled with experiences that the British empiricists (e.g. John Locke, David Hume) adapted (Mueller 2012; Sackney and Mergel 2007). Spanning the beginning of industrialisation in the XVIII century, the modern formation of the paradigm started with Charles Darwin’s theory of evolution that triggered the observation of and research into overt animal behaviour (Bouton 2007; Kyrö 2005).

The theory of classical conditioning (or stimulus substitution) pioneered by the Russian physiologist Ivan Pavlov, whose name might “ring a bell” not only for dog owners, laid the foundations for traditional learning theory, whereby behaviour is considered as a reflex to stimuli and hence can be conditioned, observed, measured, and changed (Mueller 2012; Sackney and Mergel 2007; Pavlov 1927). The famous experiment involved Pavlov conditioning the salivation of a dog (a reflex), whenever a bell (a neutral stimulus) rung, by associating the sound of the bell with food (Pavlov 1927). Watson (1913) performed a similar experiment with a boy, Arthur, and a white rat, conditioning a feeling of fear of the rat in the boy using a sudden loud noise, where the boy was initially unafraid of the rat. Although Watson’s approach looks rather questionable today, his work made a known contribution to the role of conditioning in the formation of emotional responses to stimuli (Mueller 2012; Sackney and Mergel 2007; Watson 1913). Thorndike (1932), like Pavlov, started his research with animals, but studied the learning of cats, prior to researching humans. In either case, people do not differ from animals in behaviourist terms. Thorndike came up with connectionist theory that stipulated

learning is the formation of a connection between a stimulus and a response, where for the connection to become stronger it has to be practiced, or reinforced (Sackney and Mergel 2007, Thorndike 1932). He also suggested that learning was an outcome of trial and error, and emphasised the opportunity to benefit the learning process using positive behavioural reinforcements (Mueller 2012). Thorndike's research is sometimes classified under operant conditioning.

The theory of operant conditioning developed by Skinner (1950) differs from classical conditioning in focusing on voluntary behaviours operating upon the environment, where a learner receives a reward. One deals with respondent behaviour, the other deals with operant behaviour. As a result, a bond between an operation (behaviour) and the reward stimulus is established (Sackney and Mergel 2007). The associated experiment involved Skinner teaching pigeons to play a form of ping-pong by rewarding (with food) successive steps of the subjects in moving a lever (ibid 2007; Skinner 1953). The food represented both a consequence and reinforcer of a pigeon's behaviour. Similar to Thorndike, Skinner considered reinforcements most crucial for the learning process.

Around the 1920s, researchers started to understand the limitations of behaviourism in explaining learning processes (Sackney and Mergel 2007). Behaviourists could not explain certain expressions of social behaviour, for instance, why children do not copy all behaviour that was reinforced, or why sometimes behavioural imitations occur a long time after an initial observation and without any reinforcement. In response, Tolman (1922) surmised that other, unobservable, events or mechanisms exist that explain behaviour. He suggested that learning is not only the reaction of an organism to certain stimuli, and learning theory should also take due account of the inner motivation as well as emotions, desires or instincts of an individual (Mueller 2012; Tolman 1922). Tolman attempted to understand learning as a problem-solving process and stated that any learning starts with a problem, which the individual wants or has to solve (ibid 1922). With Tolman's input a wave of neo-behaviourism was born that eventually led to the formulation of the social cognitive and gestalt theories, and the cognitivist learning paradigm (Bandura 1986).

Table 3. Major paradigms of learning and its features

<i>Paradigms of learning/ features</i>	Behaviourism	Cognitivism	Constructivism and social constructivism
Historical period	Beginning of industrialisation, XVIII century, modern era	XX century, end of modern era	Post-modern transition, 1970s
Key theories and scholar(s)	<i>Classical conditioning</i> – Pavlov (1927), Watson (1913), Thorndike (1932) <i>Operant conditioning</i> – Skinner (1950) <i>Neo-behaviourism</i> – Tolman (1922), Bandura (1977)	<i>Social learning theory</i> – Bandura (1986) <i>Cognitive development theory</i> – Piaget (1929), Vygotsky (1978) <i>Gestalt theory</i> – Wertheimer (1922)	<i>Cognitive development theory</i> <i>Activity theory</i> – Vygotsky (1978) <i>Humanistic theory</i> – Rogers (1969) <i>Andragogy</i> – Knowles (1985) + <i>Praxeology</i> – von Mises (1949) and <i>Pragmatism</i> – Dewey (1933; 1938)
Standpoints - Epistemological - Ontological - Axiological	-Knowledge and truth are grounded in empirics, deducted from experience, observation or experiment. Learning is a change in behaviour, sum of reactions. -Human being is a product of her upbringing and evolution; reward of “good” and discouragement of “bad” habits. -Any behaviours can be measured, trained and changed; trial and error.	-True knowledge can be acquired through rational reasoning, observation and internalisation of knowledge. Human is an isolated thinker. Learning is inside the person, intrinsic motivation. -Rules and algorithms of mental function; cognition determines behaviour. -Initial truth exists “a priori”. The world can be changed through order and technology.	-Individual constructs information/knowledge based on previous experiences, interaction with other learners. The learning process is situational. -Construction of reality fully depends on individuals. -Senses and values are made and assigned by the learners; knowledge is dynamic; confusion, cognitive conflict and novel situations condition deep learning.

2.1.2 Cognitivist learning

If in the behaviourist paradigm mental processes were identified in terms of behaviours to which they lead, these processes including thinking, decision-making, problem solving are at the core of the cognitivist paradigm (Hoy et al. 2013). Technological progress in the XX century influenced the idea of human learning. In the world of order and technology, the human brain had been synonymous to a computer programme regarded as part of a larger system (Kyrö 2005). Cognitivism is epistemologically grounded in rationalism, which defines learning as information processing that is beyond the stimulus-response principle and excludes sensory perception as a source of knowledge (Mueller 2012; Kyrö 2005). Learners are isolated rational thinkers producing changes in the information structure. This epistemological position considers that knowledge exists “a priori”, and that it can be discovered through rational reasoning or intellectual intuition (Kyrö 2005).

The first cognitivist theory that emerged from neo-behaviourism is Albert Bandura’s social learning theory focusing on observational learning, imitation and modelling; in other words, how people learn from one another. The theory views learning as a social and self-directed process, which is also dependent on the socio-cultural context and personality disposition (Bandura 2001). By observing the social or role models of parents, teachers, doctors or politicians, learners internalise knowledge, values or principles transmitted and make it an internal standard of self-praise or self-criticism in the self-regulation process (Bandura 1977). More experienced learners become more self-regulated and less influenced by social models. The key concept introduced by Bandura is the concept of self-efficacy defined as the learners’ belief in an individual ability to perform a particular task (ibid 1977). Higher self-efficacy is associated with higher results, tolerance to failure, and the ability to deal with challenges (Bandura 1997). Social learning theory bridges behaviourism and cognitivism by encompassing attention, memory, and motivation.

A Swiss developmental psychologist Jean Piaget posited that learning is a process of adapting to the environment, where adaptation occurs through the interplay of assimilation and accommodation. While cognitivist learning is about the acquisition and reorganisation of cognitive structures (Sackney and Mergel 2007), assimilation is the incorporation of new information into existing structures without their modification, but accommodation is the incorporation of the new information that is different or conflicting, and hence, requires the modification of the cognitive structures of a learner (Piaget 1929). The theory is called the theory

of cognitive development also referred to as cognitive stage theory, because Piaget identified certain stages of the development of the cognitive structures in relation to a learner's age spanning from birth to around 20 years old. The key criticism of the theory lies in the fact that it relates mental processes with biological age, but disregards the connection between the learners and the external world. Vygotsky (1978), Russian developmental psychologist, argued that consciousness and cognition are formed in the process of socialisation; therefore, social interaction always precedes cognitive development – a view consonant with Bandura's social learning. Furthermore, as noticed by one of the followers of Piaget, the cognitive structures of humans continue developing also in (late) adulthood (Erikson 1959).

Gestalt theory founded by Austro-Hungarian psychologist Wertheimer (along with Köhler and Koffka) posits that the human mind organises and structures knowledge by adding something to the learning experience to create a “meaningful whole”, or “gestalt”, which represents a learner's natural quest for holism (Wertheimer 1922). Köhler's famous quote “the whole is other than the sum of its parts” reflects the basic idea of gestalt psychology. The nature of the human mind, according to gestaltists, demands each component of learning to be considered as part of a holistic system of dynamic relationships (ibid 1922). Learning is always needs-based and happens in relation to the existing context. Similar to Tolman (neo-behaviourist views), gestalt educators would confront learners with an ambiguous problem to trigger their curiosity and initiate the problem-solving process (Mueller 2012).

2.1.3 Constructivist learning

The construction of one's own reality and knowledge based on previous experiences, cognitive structures, and beliefs as opposed to internalising knowledge from the external environment is a hallmark of the constructivist learning paradigm (Sackney and Mergel 2007). Hence, ontologically, learning fully depends on an individual. This paradigm started to rise in the 1970s, during the post-modern transition. The information society brought a new change to the idea of the human being as a unique social actor with its own feelings, character and experiences.

Two forms of constructivism can be distinguished – one with a cognitive focus and the other with a socio-cultural focus (Hoy et al. 2013). The first is derived from Piaget, engaging learners in sense-making activities that are shaped by prior knowledge (Piaget 1976). It is also referred to as radical constructivism because it still understands a human as a functionally closed cognitive system developing

internal structures without external input (Mueller 2012). The latter acknowledges the centrality of social and cultural contexts in learning concerning diversity, multi-cultural, and interdisciplinary education, social justice, and is often called social constructivism because it posits cognitive structures that are created socially (Hoy et al. 2013). If Descartes' famous expression "I think, therefore I am" still applies to the cognitive form of constructivism, "I communicate, therefore I am" fits social constructivism emphasising the novel aspect of learning (Mueller 2012).

There are three major theories that can be elicited to form the constructivist and social constructivist paradigms – Lev Vygotsky's activity theory, Carl Rogers' humanism, and Malcolm Knowles' andragogy, as well as two adjacent movements that are classified as part of constructivism – praxeology (Ludvig von Mises) and pragmatism (e.g. John Dewey).

Activity theory was developed in the 1920s and 1930s by representatives of the Russian school of psychology, Leontyev and Rubinshtein, based on the work of Vygotsky devoted to human development (Bedny and Meister 1997). In line with the theory, human activity determines consciousness, not vice versa. This activity starts with subjects (participants of a social system), who act upon objects (representing goals that the subjects pursue), using mediating tools (technologies, processes or authority) to achieve the desired goals or valuable outcomes (Park et al. 2013; Vygotsky 1978). The learning that occurs during the activity is called internalisation, while the end result or outcome, is externalisation (or artefact creation) (Sackney and Mergel 2007). Therefore, learning happens through purposeful behaviour and is tools-mediated spanning beyond reflexology. Furthermore, this process always features the assistance of a more experienced and knowledgeable individual; transference of knowledge can take place only when connected to prior knowledge (ibid 2007). In a way, for the learning to progress according to activity theory both behavioural and cognitive processes have to combine in a constructivist setting, since it is always dynamic and socially situated, involving change and development.

Praxeology, the study of human action founded by the Austrian economist von Mises (1949), is conceptually close to activity theory. Human action is defined as purposeful behaviour that is perceived as part of a mental structure. Praxis is also an ego's meaningful response to stimuli from an external environment – with an aim to reach a goal or satisfy desires (Lackéus 2013). Praxeology, however, is not concerned with motivations for actions and the meanings of one's choices.

Another philosophical tradition consonant with the principles of constructivism is pragmatism, which began in the US in the late 19th century. One of the prominent names associated with the movement is John Dewey (1933; 1938), a philosopher,

psychologist and educator who stood at the forefront of the progressive educational thought that gradually developed into experiential learning theory (Kolb 1984) and a range of related branches such as action-based learning (Rasmussen and Sørheim 2006), problem and project-based learning, practice and work-based learning (Hynes et al. 2011; Lee et al. 2010; Park et al. 2013), authentic competence-based learning (Nab et al. 2010) and others. For that matter, Dewey is also sometimes associated with the “learning-by-doing” concept in education, though, according to Lackéus (2013), this widespread labelling was applied by later interpreters of Dewey’s work. In the early 20th century, pragmatism challenged educational practices that were widely accepted at the time; that is, neo-behaviourism and cognitivism, in pre-supposing that education should mirror the complexities of life and be linked to personal experiences, thereby being not a preparation for life, but life itself (Sackney and Mergel 2007).

The humanist theory of learning developed by psychologists Carl Rogers and Abraham Maslow defines learning as a process of self-actualisation and personal growth meaningful for learners (Mueller 2012; Rogers 1969). Humanist pedagogy educates autonomous learners assuming that people are proactive, determined and responsible beings. This idea goes together well with the theory of adult learning – andragogy, the development of which is credited to Knowles (1985). The theory views learning as an entirely self-directed process happening in the social context, where all responsibility for the outcomes rests with the learners. Andragogy and humanism are both based on the idea that adults learn differently from children (Hoy et al. 2013). More specifically, this idea builds on one of the epistemological standpoints of constructivism that individual learning depends on intrinsic motivation. Therefore, the degree of student maturity theoretically conditions their learning in a constructivist pedagogy setting.

2.2 Teaching models in entrepreneurship for higher education

The archetypical *supply*, *demand* and *competence* teaching models in entrepreneurship for higher education entered active discourse in the 2000s (Béchar and Grégoire 2005b). The framework put forward operational and ontological levels of teaching. The operational dimensions include teaching objectives, knowledge emphasised, pedagogical methods and means as well as forms of assessment. Philosophical paradigms, theoretical bases, educators’ conceptions about teaching, themselves, students, and about the knowledge taught are the dimensions situated at the ontological level in the initial version of the

framework. Different characteristics of the operational and ontological dimensions represent didactical and pedagogical choices and actions of educators, which converge into three teaching model archetypes that, in turn, find an expression in EE (ibid 2005b). These archetypes were for the first time mentioned in Reboul's (1999/1980) work on the philosophy of education.

Béchar and Grégoire (2005b) conceived that the methods used to deliver entrepreneurship content in higher education are the principal but not the only criterion that allows drawing distinctions between different teaching models. In a university or business school setting, the whole system of dimensions entailing the interaction of didactics (e.g. teaching aims, content, target groups), pedagogy (e.g. teaching methods and tools) and context (environment, infrastructure) should be examined at the operational level (Blenker et al. 2008; Fayolle and Gailly 2008; Béchar and Grégoire 2007). The practical interplay of methods with other dimensions has not been researched extensively yet. Béchar and Grégoire (2007) were the first to empirically illustrate the importing of the framework into EE by exploring pedagogical innovations in four HEIs in North America and Europe. Overall, in previous literature, *“little evidence is provided regarding the adequacy between methods used and audience specificities, methods and contents, methods and institutional constraints”* as fairly noticed by Fayolle (2013:5). However, as we know from educational science, learning is likely to become a result of teaching, when methods, plans, content, and other components of a study programme are selected appropriately (Biggs 1999; Prosser and Trigwell 1999). Respective teaching approaches become appropriate under certain starting conditions pertaining to the study matter, aims, type of audience and expected outcomes.

Didactics concern educational design and are embedded in the curriculum delivered, where teaching aims should be aligned with the outcomes expected, content and type of knowledge emphasised (abstract or contextualised to a person, situation or actions), and the composition of student groups (based on age, gender, background discipline/specialisation or other criteria) exposed to a teaching process. Didactics subsequently form the rationale for the delivery of study programmes: implementing particular pedagogical methods and means, using certain tools and technologies, and choosing the type of educational intervention given the resources and options available. Depending on how well developed the local EE ecosystem is, students can experience business model and prototype testing, joint projects with companies, and other forms of outside classroom learning. The teaching aims and the methods used to reach them demand the evaluation of the attainment of the aims set or outcomes achieved. Methods of assessment may vary from formal end-of-course examinations to feedback

provision through mentoring, assessment of student performance in authentic situations and reflections meant to serve the learning purpose. Didactics and pedagogy clearly belong to the operational level of teaching (Béchar and Grégoire 2005b).

Contextual anchoring of pedagogical interventions embodied in the support infrastructure comprises two related foci, according to Béchar and Grégoire (2007): arrangements that support an intervention at the institutional and education system levels. These include the degree of academic autonomy and the mission of an HEI, the coordination mechanisms and practices of allocating resources, on the one hand; and degree of autonomy from governments and of centralisation of the higher education system and national policies towards innovation and entrepreneurship, on the other hand. In this vein, the newer version of the teaching models framework as of 2007 accounted for external influencers on pedagogical innovations in EE not directly dependent upon educators. In terms of the EE design and delivery articulated in this thesis, state or internal regulations and financing, including education policy support, institutionalised support of student entrepreneurship established within a particular school, the level of university-industry cooperation and the EE infrastructure development, the educators' recruitment criteria can play a significant role in pedagogical choices and condition the creation of the respective learning environment (Fayolle 2013; Blenker et al. 2008). The learning environment itself features both physical and social aspects, for instance, the classroom's equipment, prototyping spaces, incubation facilities, and attitude to learning, pro-activity and engagement of students, respectively.

The ontological level of teaching is known to manifest itself at the operational level (Béchar and Grégoire 2005b). Hence, in order to draw conclusions about the ontological preoccupations of educators, it is justifiable to focus primarily on the operational dimensions and then extrapolate the obtained results to the higher order ontological perspective. The operational level is also more viable to study empirically as it directly concerns the everyday problems and needs of educators. Yet, in terms of the ontological dimensions, the philosophical paradigm as stipulated in the initial version of the teaching models framework as of 2005 can be replaced with the learning paradigm. The learning paradigm acts as a mediator between philosophical bases for teaching/learning (ontology, epistemology and axiology) and actual methods and theories (Kyrö 2005). This accordingly presupposes basic theories of learning that correspond to the teaching models. In addition to the other ontological dimensions proposed originally, the general approach to teaching, either content or process-driven, could be specified.

Consideration of these dimensions is useful for the sake of building closer connections between EE and the field of education.

The combined and adapted version of Béchard and Grégoire's (2007, 2005b) teaching models framework for EE pursued in this research project comprises six operational dimensions: curriculum, methodology, assessment, environment, regulations and financing. 'Curriculum' include teaching aims, group formation and teaching content. 'Methodology' refers to methodological focus, methods and means. 'Assessment' focuses on methods of assessment and measurement of EE outcomes. 'Regulations' cover EE policy, support structures, and training of educators. 'Financing' deals with budget allocations and EE-related income generation. 'Environment' includes the social and physical settings and EE ecosystem development. Therefore, the underpinnings of teaching and learning are taken in combination with contextual anchoring as operational specificities and the external dimensions more directed towards *EE* in comparison to the original framework (ibid 2007). Then, the ontological level features another six dimensions: dominant learning paradigm (behaviourism, cognitivism or constructivism) and educational theory as a base (a set of respective learning theories), approach (content or process-driven), and the educator's and student's conceptual roles in the educational process. Please see Table 4, which describes every dimension according to the teaching model.

How do the different characteristics and interaction of the dimensions express the teaching models, and how does this link to the dominant learning paradigms? What implications does this suggest for teaching entrepreneurship?

2.2.1 Supply model

The supply model can be related to the education "about" entrepreneurship teaching mode, or, in Braun's (2011) terms, represents the "container knowledge" approach to EE, combining elements of *the behaviourist and cognitivist learning paradigms*. It suggests a theoretical study of entrepreneurship rather than entrepreneurial training, and is entirely teaching-centred; therefore, often boring for students (Fiet 2000b). The teaching process aims to explore the nature of entrepreneurship for students, to provide them with best practice examples, to develop their critical thinking based on a theoretical understanding of the phenomenon.

Table 4. Dimensions of teaching models in EE

<i>Dimension/ model</i>	<i>Supply model: 'about' mode (learning to understand e-ship)</i>	<i>Demand model: 'through' mode (learning to become entrepreneurial)</i>	<i>Competence model: 'for' mode (learning to become an entrepreneur)</i>
<i>Curriculum:</i> general teaching aims/outcomes, content, group formation	To explore the nature of entrepreneurship. To remember and apply theoretical material in simple tasks. ->Knowledgeable personality. Homogenous groups of students. Content defined by scholarly research.	To give meaning, organise knowledge about theory and practice of entrepreneurship, understand and analyse. To inspire and motivate students to become entrepreneurs. To develop individual entrepreneurialism and provide opportunities for practice. ->Entrepreneurial personality. Content defined by students' needs.	To evaluate and create or reorganise existing knowledge for actions. Knowing, thinking, doing and reflecting – integrated into the experiential learning context. ->Entrepreneur. Interdisciplinarity is embedded. Content defined by real-life problems to be solved.
<i>Methodology:</i> focus; methods, means	Knowledge transmission and reproduction, developing critical thinking, theoretical.	Strengthening by imparting knowledge, emphasising exploration, experimentation (e.g. application of old theories in new ways). Supporting achievement of self-congruent goals and/or self-development in a team and relation of external and internal environment. Creation of special learning environment. Experience-based pedagogy: work, project, problem-based learning...	Developing know-how; emphasising communication, networking and production.
<i>Assessment</i>	Lectures, seminars; reading textbooks, solving exercises, case studies, in-class group work, discussions, business planning, watching and listening audio-visuals, etc. Exams, tests; summative. Outcomes measurement may not exist.	Lectures, seminars, field trips, simulations, animations, case studies, thematic debates, elevator pitches, business planning, internships, learning diaries, etc. Should be developed before instruction based on students' characteristics. Summative and formative (e.g. through mentoring). Some form of outcomes measurement exists (e.g. course feedback survey).	Real-life projects with companies, innovation teams, entrepreneurship labs and competitions, incubation, 24-h camps, virtual or real mini-companies, business modelling, mentorship, etc. Performance in authentic situations. Self and peer assessment. Long-term tracking of graduates. EE outcomes measurement system.
<i>Environment:</i> physical, social, ecosystem	Standard classrooms and lecture theatres. Formality and standards prevail. Underdeveloped local EE ecosystem.	Interactive classes/training sessions in standard or out-of-classroom settings, living labs, entrepreneurship camps, etc. Authenticity, ease of educator-student communication, advancement. EE ecosystem support (cooperation with entrepreneurs and industry, incubators, science parks, design factories, alumni networks, etc.).	

Operational level

<i>Regulations:</i>	EE is not a priority of the education policy or an HEI. No specialist training programmes for educators, experience in e-ship is not a prerequisite.	EE is one of the education system's priorities. Specialist advisory services or support structures for students. Pedagogical training of educators; experience in the field and pedagogy is one of the recruitment criteria.	EE is one of the top education policy priorities. Systematic support and advisory; divisions, chairs, centres. Regular training programmes for educators. Recruitment of educators experienced in the field and pedagogy.
<i>Financing:</i>	EE is not a priority in the allocation of resources and is not considered a means of income generation.	Internal support for EE development – systematic stimulation of entrepreneurial “life world”, dedication of resources ensuring scalability and sustainability. Income generation through EE: knowledge and technology transfers, spin-offs and -outs, academic entrepreneurship.	systematic stimulation of entrepreneurial “life world”, dedication of resources ensuring scalability and sustainability. Income generation through EE: knowledge and -outs, academic entrepreneurship.
<i>Dominant learning paradigm(s)</i>	Behaviourism and cognitivism	Cognitivism and constructivism	Social constructivism
<i>Education theory base</i>	Classical conditioning Operant conditioning Neo-behaviourism Social cognitive theory Cognitive development theory	Social cognitive theory Cognitive development theory, gestalt Humanism Praxeology Experiential learning theory	Activity theory Praxeology Pragmatism, experiential learning theory Humanism Andragogy
<i>Approach</i>	Content-driven. To explain entrepreneurship as a classical economic phenomenon. Teacher-centred.	Content and process-driven. To help students go through the process of self-discovery and -appropriation for possible entrepreneurial path. Learner-centred.	Process-driven. To develop expertise of students in a situational context by experiencing entrepreneurship as a process. Team-centred.
<i>Educator's role</i>	Presenter and instructor may not have practical experience in entrepreneurship.	Instructor and trainer; “cheerleader”, experienced in pedagogy and entrepreneurship.	Facilitator, mentor, consultant, coach, fellow learner, having extensive experience in entrepreneurship.
<i>Student's role</i>	Passive, receptive; rather limited.	Active, generative; wide.	Participative, co-creation of knowledge; independent and responsible.

Ontological level

Source: adapted from Béchard and Grégoire (2005b); partly used in Kozlinska et al. (2013)

The methodological focus is put on knowledge transmission, appraisal and reproduction (Braun 2011; Löbler 2006). The methods applied are mainly lectures and seminars, where students solve exercises and use knowledge about entrepreneurship to solve case study problems. The model features summative assessment – through exams and tests – comparing results with some standard benchmark (Bécharde and Grégoire 2005b). The system of measuring factual outcomes after graduation does not exist.

The supply model can often be traced in traditional universities. It features no considerable financial or regulatory support from management or targeted EE policy. Teaching takes place in a standard classroom or lecture amphitheatre and in a homogeneous group of students; for example, all doing a bachelor's degree in "International Business". The educators usually do not possess experience in entrepreneurship. They may act as presenters and ordinary instructors. They tend to be dominant (but necessarily have to) and determine or decide what and how to learn. The role of students changes from passive and perceptive to analytical and critical. They mostly listen, read, process large amounts of information, memorise, and correct mistakes based upon formal assessments. The course content is pre-defined by scholarly research and existing theory, but the ontological approach to teaching is content-driven.

The behaviourist paradigm in the supply model is visible in formal instruction and purposeful conditioning of a certain way of thinking and understanding the reality. In Skinnerian consequences-based behaviour, teachers obligatorily set the objectives of the desirable behaviour to be achieved and reinforced by learners. Thorndike's idea of the external stimuli that determine behaviour implies that learning can be manipulated through the positive control meaning, where satisfying behaviour strengthens learning and should be reinforced, while unsatisfying behaviour including mistakes should be avoided (Mueller 2012). Punishments in the form of lowered grades, if this takes place, condition failure-avoidance reflexes. The behaviourist features of the supply model are compatible with the strategic adaptation perspective in *the world of the entrepreneur* where right or wrong individual decisions lead to successes or failures. However, it does not fit well with entrepreneurial reality for obvious reasons.

Some features of classical conditioning are always present in the learning process, either in a positive or negative manner. For instance, if an educator is particularly keen on her subject and inspires students to learn, whenever they encounter the subject in the future, they will associate it with the feeling of enthusiasm and inspiration, and sense those feelings. If a teacher, on the contrary, is authoritarian and relies mainly on the punishment-reward principles, students

might associate the subject with a sense of rigidity and obligation. Therefore, one who teaches entrepreneurship is expected to be passionate about the subject to attain better outcomes for learners other conditions being equal. In a similar vein, from the cognitivist perspective, social models are more likely to become sources of learning, when the learners associate certain status, power, competence or other distinctive features with them (meaningful effects) (Sackney and Mergel 2007). Therefore, an entrepreneurship educator can act as a role model in entrepreneurial learning. This is even more important to consider in the demand model.

Cognitivism in the supply model questions what happens inside learners' heads. It shifts the focus from the stimulus-response principle, which does not always result in learning, to a surface or deeper cognitive understanding of the subject matter that gets stored in the short- or long-term memory (Mueller 2012; Sackney and Mergel 2007). The most common applications of the cognitivist theories teach students how to remember, organise and process information, elaborate upon as well as apply it (Hoy et al. 2013). The level of entrepreneurial knowledge resulting from EE obviously depends on how respective teaching methods are enacted. For instance, business planning can be a formal assignment where students familiarise themselves with the notions of the vision and mission of an organisation, cash flow, balance sheet, etc. and submit individual plans based on that. Alternatively, it can be a group work based on a particular case or a new idea that stimulates more discussion and thought processes making it compatible with *the world of cognition*, its linear phase specifically. Within this teaching model, the practical application of theory is, however, limited to in-class settings.

All in all, the supply model that features elements of behaviourism and cognitivism can be useful for learning to understand entrepreneurship followed by further levels – learning to become entrepreneurial and learning to become an entrepreneur (Hytti et al. 2004; Gorman et al. 1997).

2.2.2 Demand model

The demand model stands on the principles of *late cognitivism and constructivism*. Students are in the centre of this model as prospective or acting founders/team members of a company within their biography and social setting (Müller and Diensberg 2011). The model embraces *the worlds of (non-linear) cognition and process*, and runs in the education *through* entrepreneurship mode. Educators make and let students experience elements of the entrepreneurial process both inside and outside the classroom. Teaching is conceived in terms of developing and supporting the environment that enables the appropriation of knowledge, while the

curricular focus rests with entrepreneurial personality development, facilitation of self-discovery and self-appropriation in students. The approach to teaching is both content and process-driven.

Teaching within the model aims to increase motivation in choosing entrepreneurship as a possible career path, to develop the sense of initiative and entrepreneurial attitude, knowledge, and the skills of students applicable in various settings (Béchar and Grégoire 2005b). It strives to make the learning experience meaningful by organising knowledge about theory and the practice of entrepreneurship, letting students understand, analyse and reflect upon their own learning, forming a holistic picture (or an entrepreneurial gestalt) (Fiet 2000b; Piaget 1929; Wertheimer 1922). It focuses on individual and group behaviour, life plans, and value creation calling for active knowledge construction combining the elements of the theory of cognitive development and gestalt (late cognitivism), praxeology, humanism and experiential learning theory (constructivism). Respectively, methods applied within this model are meant to encourage exploration, discussion and experimentation: field trips, simulations, thematic debates at roundtables, elevator pitches, role plays, internships, reflections, to mention a few. Business planning and case studies are also applicable as long as they are delivered in a constructivist spirit. Teaching in the demand model takes the form of training and facilitation. Assessment is not only summative, but also formative. Formative assessment is feedback-driven and aims to help students realise their own strengths and weaknesses, provide personalised solutions to the learning challenges. Concept maps, reflections and any work submitted for intermediary feedback are the examples of formative assessment methods.

Authentically, learning content and methods should be selected beforehand based on student demands to ensure accommodation of new information into the cognitive structures of the learners in this teaching model (Sackney and Mergel 2007; Béchar and Grégoire 2005b). The theory calls for the adaptation of teaching materials to the developmental stage of the learners in order for them to accommodate the new information thereby supporting the transfer and interference effects (Sackney and Mergel 2007). Piaget's theory coupled with gestaltists' views underlines the idea of cognitivism that the cognitive processes are, in principle, controlled by the learners. The modification of the cognitive structures and the organisation of knowledge into a gestalt also means that learning involves the active construction of knowledge (Mueller 2012; Piaget 1929; Wertheimer 1922). However, knowledge construction is conceived as an individual task although often enacted in group settings as the respective teaching methods foresee.

Within this model, higher demands are set for educators. They are expected to possess practical experience in entrepreneurship and its pedagogy to bring real-life examples into the classroom and share their expertise, to have a professional network of entrepreneurs to involve in EE. The educators are not only instructors as in the supply model, but mainly trainers and facilitators. The demand model is a step forward towards the wide, active and generative role of students, where they are acting, thinking, knowing and reflecting on their learning experience.

In terms of the external dimensions, EE programmes and courses that fall under the demand model are well-integrated into the entrepreneurship support systems within HEIs; for example, specialist advisory services, clubs and societies, as well as within the EE ecosystem (e.g. alumni networks, cooperation with industry and entrepreneurs). The school management dedicates resources for EE development systematically that also secures regulatory support at the government level. EE is one of the education system's priorities. Entrepreneurship educators have opportunities to build on their expertise by attending specialist pedagogical training.

2.2.3 Competence model

Finally, *the competence model* is concerned with developing entrepreneurial competences for venture creation and is concordant with *the social constructivist paradigm*. The education for entrepreneurship teaching mode and *the world of method* come into play here. Teaching takes the forms of coaching, training and mentoring (Müller and Diensberg 2011; Löbler 2006), ensuring self-directed and experiential learning for students with the aim of making them apply knowledge that is given when needed, and change or create new knowledge (Heinonen and Poikkijoki 2006) that is socially or team-embedded. Knowledge acquired by the learners, based on situational needs during this process, is much more valuable than that readily prepared and transmitted during standard lectures because it is applied instantly and stays in the long-term memory (Mueller 2012).

Within the interactive and authentic learning environment, the model foresees experiencing the entrepreneurial process, interdisciplinary teamwork and university-industry cooperation, including novel platforms such as innovation factories, venture and living labs, science and technology parks among others (Löbler 2006). Given that deep and meaningful learning usually occurs during periods of confusion, through reflection upon and resolution of cognitive conflict, either the created environment or the tasks and projects learners complete are supposed to confront them with a novel situation pushing them out of comfort

zones thereby extending the boundaries (Sackney and Mergel 2007). Constructivist learning involves a great amount of teamwork, encourages questioning, experimentation, reflection, process-based feedback, and revolves around solving real-life problems (Park et al. 2013). Some of the typical teaching methods in this model are the creation of student enterprises, 24hr entrepreneurship camps, and real-live projects with companies, mentorship, and others. Unlike in the supply model, the students are allowed to make mistakes and are encouraged to celebrate them as the reality is always uncertainty-led, and mistakes are to be learnt from (Löbner 2006). Activities exploring and being based on contradictions, change, and dynamism are often called entrepreneurial, but they also make up the axiological standpoints of the constructivist paradigm (Murphy et al. 2006; Kyrö 2005).

Assessment practices in this model emphasise performance in authentic situations. Self and peer assessment is used commonly, and the long-term tracking of student results is habitual. That said, as opposed to the supply model which entitles teachers to exercise full control over student learning, in constructivism teachers cannot access the learners' minds, and therefore, the outcomes are essentially subjective. Yet, social constructivism still accounts for the value of the written or verbal reflections of the learners (Mueller 2012). This adds the flavour of subtleness to the evaluation of the outcomes in the competence model as well as the demand model, to an extent.

Along with the demand model, it is characterised by the ease of communication between educators and students, internal managerial support for EE development and systematic stimulation of entrepreneurial "life world" (Gibb 2005). HEIs dedicate resources to EE development to ensure income generation through entrepreneurial activity – knowledge and technology transfers, spin-out companies and/or academic entrepreneurship. The model is driven by the process perspective of entrepreneurship, and the programme content is defined by real-life problems and needs. Educators see themselves as facilitators, coaches, mentors and/or fellow learners. They are supposed to establish an atmosphere of mutual trust and respect, become equally accepted members among self-directed learners who take on a participative role in the co-creation of knowledge (Rogers 1969).

The implementation of the competence model features strong regulatory and ecosystem support. Similar to the demand model, here EE is prioritised in the state education policy. Within an HEI, EE is institutionalised in the respective chairs, divisions and support centres. Effective implementation of teaching methods outside the classroom logically depends on the strength of the university-industry cooperation. The availability of EE infrastructure (e.g. design factories, science

parks, incubators) through which educators can leverage experiential learning methods, is another characteristic of the model.

It should be fairly acknowledged that hybrid models that feature elements of adjacent models are more likely to be encountered in practice, namely, the supply-demand and demand-competence models alongside learning paradigms overlapping each other. What is more, in the existing diversity of EE programmes, a supply-competence hybrid is also possible as Béchard and Grégoire (2007) demonstrate. The distinction between “hybrid” and “pure” models is sometimes a matter of expository convenience (ibid 2005b), but, to a varying degree, all three models and paradigms can be present in entrepreneurship teaching practice. A simple illustration of the presence of the behaviourist paradigm in the competence model is the application of operant conditioning, whereby a positive attitude to failure is reinforced through allowing students to fail multiple times successfully thus conditioning the will to learn from and through challenging situations.

Alignment of dimensional characteristics to comply with a particular model is considered crucial for effective interventions, as education research suggests (Ramsden 2003, in Béchard and Grégoire 2005b; Biggs 1999). Béchard and Grégoire (2007) demonstrate that pedagogical innovations tend to gravitate towards discrete configurations of these characteristics by identifying the dominant teaching models used in four programmes in North America and Europe. Drawing upon this work, the authors distinguish several types of coherence: between the ontological and operational elements (within the model), between the arrangements at the institutional and education system levels, and between the teaching model and the two types of arrangements that support it. However, if the notion of multi-level coherence translates into the quality of intervention as measured by student outcomes, it is still open to empirical tests of whether coherence or even incoherence could ultimately work better and what types. To take a step further in applying Béchard and Grégoire’s framework, this research evaluates the outcomes associated with traditional and experiential EE.

Owing to the solid educational basis, the teaching models framework can be a fruitful way of classifying EE programmes and courses. Despite its usefulness for designing and evaluating educational interventions, it has been somewhat neglected in the EE literature. In the meantime, the framework is a reliable basis for mapping EE interventions in different countries and regions, and for empirically validating hypotheses about the outcomes associated with different forms of EE. Taking the dichotomy of experiential and traditional EE that is essentially easier to work with, it has straightforward parallels with the teaching models. Experiential EE as such denotes the application of experience-based pedagogy, which is an

umbrella term that encompasses the existing and evolving variety of branches: work, project, practice, problem-based and other forms of experiential learning (Hynes et al. 2011; Lee et al. 2010; Nab et al. 2010); methods modelling entrepreneurship and working life, participative methods streamed from these branches (Akola and Heinonen 2008). On the continuum of theoretically and practically-oriented courses (e.g. Piperopoulos and Dimov 2014), the supply model strives towards a traditional end, the demand and competence teaching models strive towards an experiential end. Therefore, experiential EE can be defined *as a process of equipping students with entrepreneurial competences in line with demand, demand-competence or competence teaching models* (Béchar and Grégoire 2005b; QAA 2012). Traditional EE, in turn, falls under supply and supply-demand models. This working definition is followed throughout the thesis.

Pursuit of a certain approach, teaching model or hybrid that dominates in one's practice is empirically diagnosable. The pedagogical choices of educators made either consciously or by chance are expected to be associated with factual outcomes for learners. As has been pointed out, experiential learning approach is advocated to be the most appropriate for EE. The main reason is quite obvious and pragmatic – deriving better or higher level outcomes – entrepreneurial competences that are required for setting up a new private venture or for identifying/creating and exploiting opportunities in other contexts (e.g. employment, private life). Demand-competence models accord well with the nature of entrepreneurial learning in the world of entrepreneurship as a method, but is it universally applicable? This question is elaborated upon in the following sub-chapter.

2.3 Experiential nature of entrepreneurial learning

“Entrepreneurship is neither a science nor an art. It's a practice.” The quote by Drucker (1985:30) does a good job in pointing out that entrepreneurship differs from other social disciplines. This is not to claim that scientific method is irrelevant for the field, but to underline that entrepreneurship primarily favours applied research and is experience-driven. Drawing upon Fisher (2012), Sarasvathy and Venkataraman (2011), Heinonen et al. (2011), Fillis and Rentschler (2010), Bennis and O'Toole (2005), Bhavé (1994), and Ronstadt (1987), general entrepreneurship practice is always process-related and can be characterised by the following features:

- creation of new values and/or needs;
- strong personality and human factors;

- complexity and non-linearity of decisions;
- randomness, uncertainty and ambiguity embedded in the wider social and business contexts, high risk-factor;
- heuristics and dynamism, environment with changing conditions and “rules of the game”;
- unexpected changes of perceptions and priorities of individuals;
- high dependence on personal networks;
- on-going competition or collaboration for customers/market share;
- feedback-driven and iterative;
- suits motivated and determined individuals.

In a similar fashion, one can hardly grasp how to confront these features constructively from a theoretical viewpoint, having not experienced them or having not worked under the respective conditions. Tackling the heuristic environment with no evident and logically deductible solutions obviously requires special competences, idiosyncratic cognition and behaviour (Holcomb et al. 2009; Baron 2004; Baron 2000). Due to the limited understanding of how to teach entrepreneurship, scholars often turn to acting entrepreneurs in search of patterns of learning (e.g. Cope 2011; Man 2006; Cope and Watts 2000). That is why “entrepreneurial learning” carries a double meaning: how entrepreneurs learn outside the education system and how students learn entrepreneurship at any educational level (Lack us 2013). Nevertheless, the mainstream EE literature sees entrepreneurial learning as a social learning process based on experience (e.g. Holcomb et al. 2009; Krueger 2007; Rae 2006; Minniti and Bygrave 2001). This conditions and challenges best pedagogical practices to match known cognitive phenomena and beyond (Krueger 2007).

New theories (at the time) that formed the world of entrepreneurship as method, including effectuation and bricolage (e.g. Fisher 2012; Baker and Nelson 2005), entered entrepreneurship research because they provided better qualitative explanations of the cognition and behaviour of entrepreneurs. Entrepreneurship is socio-constructivist by definition, hence, the traditional causation-only approach to education can be regarded as either insufficient or unsuitable (Bruyat and Julien 2000). Until now, the dominant advocacy of experiential learning in EE research comes as no surprise. Simultaneously, experience-based learning is relevant for psychology, law, linguistics and other social sciences equally well, not to mention some exact sciences, such as medicine or chemistry. However, the share of experiential learning in the exact sciences is likely to be considerably smaller due to the vast amount of theory one has to acquire. That being said, learning for potential entrepreneurs still differs insofar as it demands practice in the absence of

fundamental theory or ready prescriptions of success because every experience is unique and non-replicable, including failures.

It is recognised that entrepreneurs think and act differently than other people (Baron 2000; Baron 1998). At the dawn of the growth in the field, Gartner (1988) established that behaviour is the key – instead of looking at personality traits (i.e. trying to answer who an entrepreneur is), researchers should ask how entrepreneurs behave and what they do. This created a major shift in the literature from the world of the entrepreneur to the worlds of process and cognition. While some differences in personality traits may well hold – the need for achievement, risk- and responsibility-acceptance, and tolerance of ambiguity (Rotter 1966; McClelland 1961) – the main cognitive, affective, and consequently, behavioural differences come from entrepreneurs acting in an uncertain, penurious and demanding environment (Baron 2008; Krueger 2007; Baron 2004). Entrepreneurs are more likely to be exposed to a range of psychological biases, including over-confidence, counterfactual thinking, planning fallacies, illusions of control and self-justifications (Baron 2004; Baron 1998). However, they might also be more resistant to them (Baron 2000). Only by realising these biases and learning to deal with them as part of daily life, and to derive useful senses, can novices progress into experts (Krueger 2007; Cope and Watts 2000). Only through learning-by-doing or direct observations can one understand how to become entrepreneurial (Minniti and Bygrave 2001). During critical developmental experiences analogous to those that acting entrepreneurs confront, can learners in education “*resolve discrepancies and contradictions in their constructed knowledge base*” (Krueger 2007:125) and transform and grow into entrepreneurial individuals (Minniti and Bygrave 2001). This way, they understand the changes that are happening during the learning process and the changes required to become more expert.

One can study business modelling or planning and the principles of pitching business ideas, listen for success stories from acting entrepreneurs, read and critically discuss iconic academic papers in entrepreneurship, and so on. Yet, in line with the dominant logic, activities of this kind (i.e. falling under the “about” teaching mode, supply and supply-demand teaching models) trigger only surface learning, the direct outcomes of which get forgotten easily like higher maths unless practiced regularly. The demand-competence and competence models, on the contrary, ensure learning environments that mirror reality by breaking down borders between educational, social and professional life, and therefore, conditioning a deeper level of learning, which stays in the long-term memory. Naturally, the more one practices, the more expert one becomes, as in any applied discipline. However, meaningful evolution and transference of entrepreneurial

competences, including cognitive structures and deep beliefs, which determine behaviour, is rendered possible in a constructivist setting that is quite challenging to provide within the formal education system, presumably, not least of all due to the influence of external dimensions, such as state education policy and funding for EE.

2.3.1 Reflection on the best-fit teaching model

In light of the experiential nature of entrepreneurial learning, the appropriateness of the demand, demand-competence and competence models for EE is almost straightforward. At the same time, there seem to be no evident theoretical reasons to disregard other models as excessive under certain conditions. The main discussion point of the prevailing contemporary interpretation and positioning of the (socio-) constructivist principles as the one and only in EE is a somewhat insufficient consideration of the premises embedded in the underlying theories and the preparedness of learners for certain forms of intervention.

As follows from the discussed theories and paradigms drawn from the psychology of learning and education, the constructivist and social constructivist paradigms are implicitly focused on experienced individuals, not complete novices in any study field (Hoy et al. 2013). In order to be able to take responsibility for one's own learning, become a self-directed learner in EE, one should be motivated and determined, predisposed towards entrepreneurship, and have prior competences to capitalise upon. Alternatively, one should be prepared for this type of learning as part of the educational process. Therefore, the competence model alone might not be universally efficient and effective for different socio-demographic groups of learners and conditions. Its appropriateness can be particularly questionable in the case of undergraduate students or secondary school pupils, especially if they were not exposed to experiential learning before and/or are not familiar with the subject matter. The principles of self-directedness, new knowledge construction based on previous experiences, cognitive structures, and beliefs link back to the theories of adult learning. Hence, regardless of its compatibility with the nature of entrepreneurial learning, following the demand-competence or competence model as the one and only might not yield the expected results. Expressing this idea figuratively, to master thinking outside the box, it is necessary to be able to think inside the box. A similar concern was conveyed by Fayolle and Gailly (2008:579), who noticed that learning-by-doing is often praised by entrepreneurship educators, but caution is urged in configuring EE interventions

because active methods might be “*well suited to some pedagogical situations*” and “*particularly inappropriate in the others*”.

The entrepreneurial learning architecture from scratch is complex, comprising experiential, vicarious as well as theoretical learning (Holcomb et al. 2009). Such factors as the intervention volume, available resources, and educational level and background of learners (e.g. entrepreneurship-related or not), should influence educators’ choice of teaching model or the right balance of traditional and experiential methods. The less one knows and the further one’s background is from entrepreneurship, the more of the supply-demand and demand model interventions s/he might need, which would develop declarative knowledge and evoke a positive attitude towards entrepreneurship. Mature and experienced learners with prior knowledge about the subject should benefit more from demand-competence and competence model interventions that put stronger emphasis on developing entrepreneurial skills, or procedural knowledge. Although the intervention volume imposes known limitations on novices, and they are very likely to forget the material learnt within the traditional approach, subtle outcomes are attained (Vermunt 1996). This allows the learners entering the further developmental process to engage in more meaningful experiential learning. A direct analogue would be an outcome from a higher education degree in a specialist field, where one does not work. Most of the learning material is forgotten, but a subtle value that benefited the personality is produced, not counting the diploma as a tangible output. Above all, traditional learning targets general intellectual development. Learning within the cognitivist paradigm is also diverse and can be either surface or deep. It can unfold one’s creativity, wittiness, develop thinking skills to deduct, induct, and create one’s own intellectual realities... “*What matters is never a technique per se but rather the spirit in which the technique is used*” (Frankl 1988:29).

This chapter established closer conceptual connections between the teaching models in entrepreneurship for higher education with the dominant learning paradigms thus strengthening the pedagogical side of EE. It introduced the adapted version of Béchar and Grégoire’s framework and presented the dimensional characteristics of each model. This directly informs the wider integrative framework for evaluating the outcomes of EE (Chapter 4) and serves as a guide for classifying the EE courses analysed empirically in the thesis (Chapter 6). The operational and ontological dimensions of the teaching models, types of coherence within the models and between the dimensions ground the discussion about educators’ practices and learners’ outcomes associated with traditional and experiential EE (Chapter 8).

3 OVERVIEW OF ENTREPRENEURSHIP EDUCATION IMPACT STUDIES

The importance of evaluating educational outcomes is, on the one hand, generic and applies to every discipline from physics to arts. A responsible and curious educator finds out whether her educational practice impacts students as planned and desired. Study programme leaders make the relevant adjustments in curricula and methodology. Admission offices often rely on impact figures when marketing programmes. On the other hand, the assessment of the outcomes of EE has become increasingly important since entrepreneurship as a discipline in business schools and universities started spreading at an exponential rate in mid-1990s (Katz 2003; Solomon 2007; Wilson 2008). In Europe, entrepreneurship and education are among the fundamental elements of the long-term regional development strategy for inclusive growth (EC 2010a). Education is the primary pillar in the “Entrepreneurship 2020 Action Plan” for reigniting entrepreneurial spirit. In view of this growth, the evaluation of the outcomes of EE is both topical and practical.

To date, a multitude of studies on the impact or outcomes of EE exist. The terms “impact” and “outcomes” tend to be used interchangeably in the literature as well as in this work although they may have different connotations; for example, not every outcome is an impact. The very first approaches to evaluation in EE were somewhat formal and driven by accepted quality standards; for example, ranking study programmes based on certain criteria, such as leadership (administrator commitment), strategic and operational planning (how programmes set development directions and planning requirements), as well as school performance and student focus, among others (Vesper and Gartner 1997). As the field of entrepreneurship was starting to gain legitimacy in 1990s, psychology-driven models of EE outcomes or impact measurement entered the literature. Such measures as entrepreneurial self-efficacy, attitudes and intentions became very common (e.g. Bandura 1994; Boyd and Vozikis 1994). Later, a competence-based approach derived from educational sciences appeared, putting forward entrepreneurial knowledge, skills and attitudes as the main measures (e.g. Fisher et al. 2008; Kraiger et al. 1993). In the meantime, the number of start-ups or self-employed individuals served as a universally accepted measure (Mwasalwiba 2010). Concurrently, discussions about “*the teachability dilemma of*

entrepreneurship” (Haase and Lautenschlager 2011:175) continued, ranging from research in quantitative genetics to studies among active entrepreneurs (e.g. Teigland et al. 2011; Wadhwa et al. 2009). Despite the fact that this research niche is already rather crowded, the results of the studies on EE outcomes vary. Furthermore, there are still several gaps this doctoral thesis aims to bridge.

This chapter is organised along the following lines. First, it elaborates upon the teachability of entrepreneurship as a discipline. Then, it critically reviews selected studies on the impact of EE and their findings to build a discussion background. The selection covers mainstream groups of measures in EE research, and is geared towards experiential interventions, and includes qualitative studies. The discussion extends to insights into the outcomes of activity-based learning from other disciplines. Finally, the chapter emphasises the key gaps and challenges in the evaluation of outcomes for entrepreneurship educators and researchers.

3.1 “The teachability dilemma” of entrepreneurship

The question “Is entrepreneurship teachable?” was admitted obsolete over a decade ago (Kuratko 2005). Nevertheless, researchers, educators, students and other stakeholders continue to debate whether entrepreneurs are born or made and whether it is nature or nurture that determines one’s ability to build a (successful) career in entrepreneurship (e.g. Haase and Lautenschlager 2011; Henry et al. 2005; Jack and Anderson 1999). The very first influence that nature has on humans is the fact of birth from a certain pair of parents. With this, an individual receives a combination of genes and the conditions under which he or she is raised. Therefore, studies that explore the association of genetic factors with entrepreneurial behaviour are indicative. Further, education and work history for acting and/or well-established entrepreneurs and self-employed individuals and their career paths can be informative and can shed more light on “the born or made dilemma”.

Studies in the field of quantitative genetics have arguably reached the forefront of entrepreneurship research rather quickly with the ambitious aim of discovering the entrepreneurship gene (Nicolaou et al. 2011; Van der Loos et al. 2011). While scientists in the related newly established branch of quantitative genetics called “gentrepreneurics” are still working on this task, genetic influence on self-employment has already been detected. Nicolaou et al. (2008) compared the entrepreneurial activity of 870 pairs of monozygotic (identical, share 100% of their genes) and 857 pairs of same-sex dizygotic (each shared 50% with the other) twins from the UK, who grew up in similar environments. The study examined the most

common operationalisations of entrepreneurship, such as self-employment, starting a new business, being an owner-operator of a company and engaging in the start-up process. No significant differences between the two groups of twins on the measures were found, but the self-employment prediction showed that genetic factors explain 48% of the variance in the propensity to become self-employed (i.e. this tendency is heritable). Fifty-two per cent (52%) were explained by non-shared environmental factors (for instance, education and practical experience), suggesting that family environment or upbringing has no significant influence (Nicolaou et al. 2008).

A subsequent study by Nicolaou et al. (2011) analysed the association between five dopamine receptor genes (linked to novelty/sensation seeking) and four attention deficit hyperactivity disorder genes with the tendency to be an entrepreneur among 1,335 individuals from the UK (the same used in the earlier twins study). The analysis resulted in the very first evidence of a specific gene, namely, a single nucleotide polymorphism of the dopamine receptor D3 gene, significantly associated with entrepreneurship. However, a replication study urged for by the authors questioned the finding profoundly. An attempt by van der Loos et al. (2011) to replicate the significant association between a genetic variant in the dopamine receptor D3 gene and the tendency to engage into entrepreneurial activity in a much larger sample of Dutch individuals from three cohorts of the Rotterdam Study (N₁=5374, N₂=2066, N₃=1925) failed. The group of scientists thus suspected that Nicolaou's et al. (2011) reported association is a false positive.

The non-shared environmental factors that significantly contribute to explaining the propensity to become self-employed or engage in entrepreneurial activities detected by Nicolaou et al. (2008) is certainly a piece of good news for entrepreneurship educators. Even if an entrepreneurship gene is finally found, it does not make teaching the discipline to those not biologically "born" as entrepreneurs irrelevant, but will open opportunities for more targeted pedagogical interventions. Although genetic factors partly explain the tendency to become an entrepreneur, they cannot be regarded as the unique determinant. Although "innate hard writing" takes place, learning is the only way to become an expert (Krueger 2007). Furthermore, in fewer cases study programmes aim "to produce entrepreneurs" upon graduation. What remains unclear is whether only those individuals who possess the gene become de facto entrepreneurs and are also able to maintain the status. If you are not genetically predetermined to be self-employed, how does EE benefit you – can you become more entrepreneurial, proactive, confident in your own success, or more successful on the job market?

Some studies have focused on acting entrepreneurs and their life paths to find out indicative information on educational background and career, and to draw respective parallels. Research results published by organisations are informative, albeit in descriptive terms, in this respect. For instance, Wadhwa et al. (2009) from the Kauffman Foundation surveyed 549 successful American entrepreneurs working in a diverse set of industries ranging from aerospace and biotechnology to electronics and healthcare. *Over 75% of them had a significant industry experience as employees before starting their own companies.* The entrepreneurs tended to be on average 40 years old, when starting the first enterprise, and *well-educated – over 95% held bachelor's degrees or higher.* A solid majority ranked their own undergraduate-level performance among the top 30% of their class; 50% of them did not even think about entrepreneurship and had little interest in it while at school; only 25% had entrepreneurial aspirations while at college (Wadhwa et al. 2009). Finally, over a half were the first in families to start an enterprise, while 39% and 7% had an entrepreneurial father and mother (respectively) (ibid 2009). Based on the latter, the authors concluded that entrepreneurship is not hereditary contrary to Nicolaou's et al. (2008) findings.

Another pertinent study was conducted by Ernst & Young Global Limited covering a wider geographical area: Europe, Asia-Pacific, Middle East, and Africa (the US and Canada omitted) (Teigland et al. 2011). At first, 685 entrepreneurs from over 30 countries were surveyed. This time the focus was on large companies that have over USD 10 million in annual revenues (e.g. Stifel Financial Corp. (brokerage and investment banking), International SOS (healthcare), Starbucks (coffee houses), DCS Europe (health and beauty brands), V. Hukkanen OY (fish delicacies)) (ibid 2011). The second part of this research consisted of in-depth expert interviews with nine leading entrepreneurs, winners of the Ernst & Young annual award. Although many leaders started at a young age (20–29), *45% of the surveyed entrepreneurs did not set up a company until they turned 30 years old; around 60% chose entrepreneurship as a career path having transitioned from employment; 30% of the respondents credited higher education for key career learning, 33% – previous employment, 26% – mentors, and 21% – family.* The authors concluded that entrepreneurial leaders are made, not born, supporting the “nurture over nature” stance.

Descriptive statistics are certainly not as convincing as statistical inferences drawn from the application of quantitative methods. Two papers by Block et al. (2011) and Robinson and Sexton (1994) counter-balance this deficiency in the life-path group of studies discussed, and communicate a similar message about the significance of education. To overcome a common problem of endogeneity that

occurs when attempting to establish the effect of education, Block et al. (2011) employed an instrumental variables (IV) approach in the analysis of 10,397 observations of either paid- or self-employed respondents from 27 European countries and the US. Comparison of the results obtained using a standard probit and a IV probit regression model revealed that *education has a highly significant positive effect on a decision to become self-employed* in both models. However, this effect is underestimated in the standard probit regression ($\beta=0.014$ vs. $\beta=0.137$). According to Block et al. (2011), this econometric detail explains why van der Sluis et al. (2008) found *no significant impact of formal education on selection into entrepreneurship*, using ordinary least squares regressions in their meta-analysis of almost a hundred studies. Interestingly enough that the latter study also suggests that the effect of education on earnings is smaller for entrepreneurs than for employees in Europe, but larger in the US.

Robinson and Sexton (1994), in turn, examined the effect of education on the probability to become self-employed and the related performance (measured as profit/earnings). Drawing upon a sample of 21,352 self-employed individuals and 159,804 individuals in paid employment from the US census data (1979), the authors used the multiple linear and probit regressions and concluded that *one additional year of education increases the likelihood of becoming self-employed by approximately 1% ($\beta=0.008$)*. It is also expected to result in a USD 1,207.63 and USD 825.99 increase in self-employment earnings and paid employment earnings, respectively. Therefore, the study confirmed the significant positive influence of general education on both groups of subjects. Furthermore, it confirmed a strong positive relationship between work experience after graduation and self-employment, which is consonant with Teigland et al. (2011) and Wadhwa et al. (2009). Irrespective of the fact that the estimated parameters in this study can be biased due to omitted variables, reverse causality or other measurement imperfections (Block et al. 2011), it also supports the overall conclusions reached in the aforementioned papers published by Kauffman Foundation and Ernst & Young.

To sum up, clear evidence can be found that *education in general is a significant predictor of one's choice to pursue a career in entrepreneurship; the higher the level of education the greater the likelihood of becoming self-employed*. Although *genetic factors explain almost half the variance in the propensity to become self-employed*, even individuals genetically predetermined for self-employment are likely to need education including in entrepreneurship (not counting those, who are able to pave their paths without formal education, which should be rather regarded as an exception). These findings, however, do not provide a compelling answer on

whether entrepreneurship is teachable. While they hint in certain terms that entrepreneurship can be nurtured through education, this brings the discussion forward by *questioning whether education in entrepreneurship specifically affects individuals to become entrepreneurs or entrepreneurial and how.*

3.2 A selection and critical review of EE impact studies

Papers for this critical overview were selected using Harzing's Publish or Perish software. The software is fully based on Google Scholar and provides wider and faster coverage of academic sources than ISI Web of Knowledge when it comes to the social sciences (Harzing 2007). The software itself facilitates the selection process by accompanying search results with key metrics and data about papers, such as the number of citations, journal (or other source), publication database, year and author(s) in a compact table.

Figure 2 below outlines the five steps of the search, screening and selection of papers for this overview. The process started with two queries (A and B) containing the phrases "impact of entrepreneurship education" and "impact of experiential entrepreneurship education" (this yielded much more results including but not limited to those returned with the term "outcomes"). A total of 2,000 papers, 1,000 per query, from diverse sources spanned over 24 and 39-year periods and featured 10,922 and 30,045 citations, respectively. By excluding papers with less than ten citations, published prior to 1990 and from journals not listed in the Academic Journal Quality Guide (Harvey et al. 2010), 156 and 350 papers were initially selected. Following the first screening procedure based on titles and abstracts, 31 and 6 papers met the requirements of being focused on the student population and measuring the outcomes of EE in higher education. The second screening based on the introduction and methodology sections returned 14 and 2 papers matching the following criteria:

- a) empirical papers, quantitative or qualitative;
- b) systematic literature reviews and meta-analyses;
- c) quantitative studies should demonstrate statistical rigour, solidness of research design (pre- and post-test measurements, experimental and quasi-experimental or post-tests with controls);
- d) the studies should include comparative aspects, e.g. entrepreneurship and non-entrepreneurship, business and non-business students; experiential and traditional interventions;
- e) full-texts should be available (i.e. exclusion of IngentaConnect, InderScience and similar databases).

As a result, 16 papers were selected. The list was added to with five references of references. The studies published in the Edward Elgar books are also acknowledged, but not included in the overview due to either small samples or duplication of messages conveyed in the journal papers by the same authors. Therefore, the total number of papers reached 21. Table 5a presents a list of the selected studies consisting of quantitative and qualitative papers as well as systematic and meta-analytical reviews. Quantitative papers can be further divided into three major groups by the type of measures employed: 1) subjective measures, which are psychology- and education-driven, such as self-reported knowledge, skills, attitudes, self-efficacy, and intentions; 2) objective measures expressing more tangible outcomes, such as nascent entrepreneurial behaviour, start-ups founded, employment and income generated; 3) mixed, where both subjective and objective measures are used. Table 5b summarises the ensuing overview. It provides details about subjects, sample sizes, methods, instruments, educational interventions, and the results of the assorted studies. Table 6b does not display the details of the systematic and meta-analytical reviews, although they make a valuable contribution to the discussion.

3.2.1 Quantitative studies

Subjective measures: entrepreneurial self-efficacy, intentions, competences

In a wide variety of studies devoted to measuring the outcomes or impact of EE, those relying on subjective measures are the most widely encountered. This might be the case due to the relative ease of using this type of outcome, including access to and speed of collecting data. The existence of well-established theoretical foundations for both intentionality (e.g. Bandura 1994; Boyd and Vozikis 1994; Krueger and Brazeal 1994) and competence models (e.g. Heder et al. 2011; Kennedy et al. 2006; Kraiger et al. 1993) is another advantage of these measures. The former, however, is more popular, though it focuses on the affective and conative aspects of evaluation (Hilgard 1980), where self-efficacy, attitudes, and intentions act as antecedents of behaviour (Krueger et al. 2000; Boyd and Vozikis 1994). According to Ajzen (1987), attitudes explain around 50% of variance in intentions, but intentions explain around 30% of the variance in any planned behaviour (see also Armitage and Conner 2001). In addition, Zhao et al. (2005) showed that self-efficacy fully mediates the perceived learning effect from EE on entrepreneurial intentions. Yet, even if a positive effect is reported, it does not necessarily lead to subjects becoming entrepreneurs de facto or, what is more,

successful entrepreneurs. Vice versa, if the negative effect is reported, it does not mean that one fails to become an entrepreneur in the future.

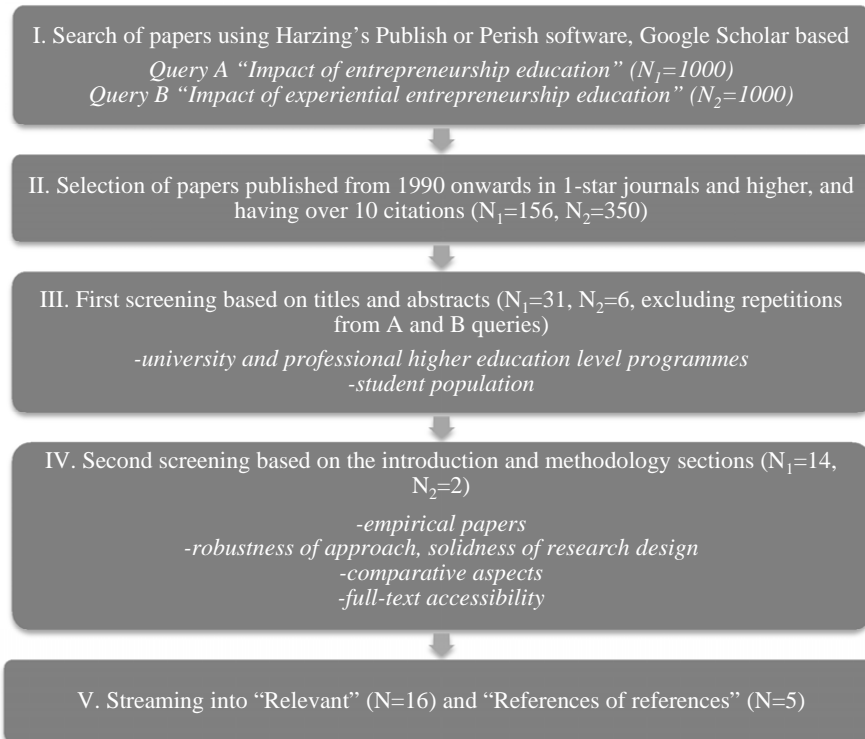


Figure 2. Flow chart of search, selection, and screening journal papers for the review

The study by Oosterbeek et al. (2010) featuring a quasi-experimental design is one of the two most frequently cited and robust examples of an educational intervention that did not bring a desired effect on students. The students were involved in the creation of mini-companies within the Junior Achievement Young Enterprise programme aimed at the general population; that is, participants did not self-select into either EE or experiential EE. The programme objective was to teach putting entrepreneurship theory into practice, to develop self-confidence, motivation, creativity and proactiveness in students. Two groups of students attending the “Business and Accountancy”, “Management and Law”, “Human Resource Management”, and “Small Business and Retail Management” study programmes at AVANS Hogeschool at different geographical locations in the Netherlands were compared. The students in one group (N=104) created mini-

companies (on a compulsory basis), while the students in the other (N=146) did not. Having conducted pre- and post-surveys in both groups, by employing the IV approach in a difference-in-differences framework, Oosterbeek et al. (2010) found that the effect on entrepreneurial intentions had been significantly negative, while the effect of the programme on entrepreneurial skills (e.g. market awareness, creativity, flexibility) and traits (e.g. self-efficacy, need for achievement, autonomy, power, etc.) was insignificant. Yet, the study did not control for prior entrepreneurial attitudes in the respondents.

Table 5a. Selected EE impact studies

Type of study	Author, year
<i>Quantitative (N=12)</i>	Piperopoulos and Dimov (2014), Rauch and Hulsink (2014), Fayolle and Gailly (2013), Lange et al. (2011), Sanchez (2011), Graevenitz et al. (2010), Oosterbeek et al. (2010), Souitaris et al. (2007), Kolvereid and Moen (1997), Brown (1990), Clouse (1990), Charney and Libecap (2000)
<i>Qualitative (N=4)</i>	Günzel-Jensen and Robinson (2014), Lackéus (2014), Mason and Arshed (2013), Matlay (2008)
<i>Systematic and meta-analytical reviews (N=5)</i>	Rideout and Gray (2013), Martin et al. (2013), Pittaway and Cope (2007), Dickson et al. (2008), Henry et al. (2005)

Graevenitz et al. (2010) came up with similar results after a compulsory business planning course at the Munich School of Management (Ludwig-Maximilians-Universität) using pre- and post-intervention measurements and multiple regression analysis. The course aimed at developing knowledge and skills for crafting a business plan, increasing awareness of entrepreneurship as a career option, and exposing students to the practical experience of interacting with acting entrepreneurs. Eventually, the entrepreneurial intentions of students declined, but the effect on self-assessed start-up skills and general confidence was significantly positive. The survey design also made it possible to conclude that the students' self-evaluation was not a result of the poor quality of the course, given the overall positive feedback. Unlike Oosterbeek et al. (2010), this study did not include a control group.

Sanchez (2011) reported a major improvement in entrepreneurial competences expressed as self-efficacy, proactiveness, risk-taking and intentions towards self-employment among 403 treatment group students. The intervention was an elective programme that comprised entrepreneurship-related courses (e.g. marketing, finance), a course on personality traits and attitudes, business planning and a practice component (talks from practitioners and networking events). The study

was based on a quasi-experimental design and employed regression analysis, one-way ANOVA, and General Linear Modelling. The sample totalled 863 mixed social sciences background (business science and economics, humanities, law, health, education, etc.) students from Spain (Castilla and León community). The non-matched control group of 460 students showed no change in pre-post responses, while there was a significant relationship between the treatment versus control groups and differences in the pre-post scores for all variables. These results would have been more convincing if supported with the following information: details about the sample, such as non-response rates of both before and after measurements for each group (not only overall 95%), the differences in pre-intervention scores showing that no self-selection bias was involved (especially relevant with the free elective intervention), and more descriptive and comparative data for the sub-group make-up (with respect to the variety of educational backgrounds).

Rauch and Hulsink (2014) performed a pre-test ($N_1=96$, $N_2=57$), post-test ($N_1=88$, $N_2=54$) and follow-up ($N_1=62$, $N_2=12$) comparison of attitudes, perceived behavioural control (self-efficacy), intentions as well as behaviour (active steps related to starting up a new enterprise) between entrepreneurship and supply chain management (logistics) master-level students at the Rotterdam School of Management (Erasmus University). The entrepreneurship programme was aimed at preparing students to establish their own businesses and built upon the principles of effectuation and experimentation. Participants took part in field projects, studied careers of famous entrepreneurs, analysed case studies and trained entrepreneurial decision-making in relation to particular firms, analysed existing ventures, and so on. The logistics programme, on the contrary, was more theoretical, causation and planning logic based. Measurements were performed at the start of the programme, then on week nine (after the theoretical part), and eighteen months after the programmes. As a result, entrepreneurship students showed significantly higher attitudes and perceived behavioural control, higher intentions and behaviour scores than their counterparts. This can also be deemed natural – just like if a student specialises in maths, she supposedly knows maths in more depth than one who specialises in chemistry, for example. A similar effect, but in favour of the supply chain management students, could be reached if logistics competences were assessed and compared in both groups. Therefore, the study does show the link between EE and the TBP informed measures of the outcomes, but is not revealing enough with respect to the effect of experiential EE regardless of the social constructivist nature of the intervention.

One more study featuring a similar design though without a control group, was performed by Fayolle and Gailly (2013) among 158 French management students at master level. An intense 3-day long educational intervention was the awareness-raising programme with learning-by-doing workshops. This showed a significant positive impact on attitudes and perceived behavioural control in the follow-up measurement (6 months after the course) but not immediately after the programme. An even more revealing finding pertained to the influence of prior exposure to entrepreneurship and belongingness in a family of entrepreneurs, which appeared to result in a counter-effect in the students. The impact on intentions negatively correlated with its initial level measured before the programme started. It turns out to be crucial to consider the prior competences of EE participants, when measuring the impact, as well as, supposedly, their age, since these factors can partly explain why in some cases intentions decline as a result (Oosterbeek et al. 2010; Graevenitz et al. 2010). One and the same programme can affect different students in various ways.

The study by Souitaris et al. (2007) is the only albeit quite robust study in the selection that was conducted among non-business, namely, science and engineering, students. Two groups were surveyed – participants of similar “best practice” entrepreneurship programmes (N=124) and those students, who did not participate in the programmes (N=126), at two major European universities (London and Grenoble). The educational interventions of interest were focused around four components – formal teaching, business planning, interaction with practice, university support – and lasted 5–6 months. Variables examined included subjective norms (what important people in the respondents’ life think about certain behaviour), perceived behavioural control (self-efficacy), attitudes towards self-employment – put another way, predictors of intentions in line with Ajzen’s theory. A quasi-experimental design was employed. Its strength was supported with the confirmed absence of a non-response bias, controlling for elective or mandatory participation in the programmes, prior attitudes and intentions, and other variables. Results showed that subjective norms and self-employment intentions increased in the treatment group significantly. It was also found that inspiration but not learning per se or resource utilisation served as the key driver for this increase. At the same time, intentions were unrelated to nascent entrepreneurial behaviour expressed in terms of business planning, financing the new firm and interaction with the external environment (e.g. registration, licensing). Some limitations could still be noticed such as significant differences between elective and compulsory attainment pertaining to perceived behavioural control, and the construction of the sample from two different locations.

Piperopoulos and Dimov (2014) compared the entrepreneurial self-efficacy and intentions of students following two traditionally and two practically-oriented elective entrepreneurship courses at a major British university. The practically-oriented courses were focused around creating and running a real-life business with an emphasis on self-directed learning. Supported by mentors and consultants, students acquired all the key topics of the entrepreneurship process, including idea generation, creativity, innovation, team building, pitching to real investors, and selling in practice. The theoretically-oriented courses run in a “stand-and-deliver” mode were aimed at developing the analytical skills of students focused around the managerial and organisational aspects of entrepreneurship. The ordinary least squares regression estimation of entrepreneurial intentions controlling for basic demographics, entrepreneurial background of family, and work experience revealed *a positive relationship between self-efficacy and intentions in the practically-oriented courses and a negative relationship in the theoretically-oriented courses*. The total number of respondents amounted to 114, of which 93 were undergraduates and 21 postgraduates. However, the exact number of students taking the theoretically- and practically-oriented courses was not specified in the study. This may well be a confounding aspect given the 12 independent variables in the regression models and relatively small sample. Moreover, the respondents from the practically-oriented courses had significantly higher self-efficacy, enthusiasm for entrepreneurship and perceived business skills but lower grades than their counterparts already prior to the courses. This source of self-selection bias was explicitly controlled for by the authors along with the undergraduate or postgraduate level of respondents. The courses were equivalent in focus and content, but no precise information about their length was provided. It might only follow from the general description of the method that they lasted for 1 academic year. Finally, the study does not focus on the direct effect of the type of the course, but on its moderation effect on the relationship between self-efficacy and intentions.

Objective measures: nascency and start-ups

The following three studies by Brown (1990), Clouse (1990), and Charney and Libecap (2000) measure more tangible outcomes, such as start-ups, nascent entrepreneurial behaviour, performance, and slightly offset over-reliance on the subjective measures. All of them report positive effects from EE. Irrespective of the fact that the studies were conducted a number of years ago unlike other papers in the selection, the rhetoric and concerns about the impact of EE are similar.

Brown (1990) assessed the impact of the Graduate Enterprise Programme (GEP) over a 3-year period (1985–1987), which was the UK government programme aimed at responding to the declining college graduate interest in self-employment over accountancy or other managerial disciplines and increasing unemployment in the 1980s. Distinctive features of the programme were purposeful casting of participants. Purposeful casting of participants was the distinctive feature of the training programme. The casting process was performed by reviewing mini-business plan applications, ideas and the prior educational background of the applicants. Out of 2,000 students who applied in 1987, 125 got GEP places. Most of these students had up to 10 years of work experience having left school at the age of 14 or earlier and were largely pre-motivated to create their own businesses at some point in their lives. The training programme followed an “*entrepreneurial-directed alternative to traditional teaching*” (p.73) and comprised 5 individual training weeks plus 11 weeks outside classrooms at market research, sales exhibitions, etc. The final result was pitched to a panel of bankers. Hence, the principles of the programme were very similar to the ones applied at Garage48 and Brainstorm hackathons, Big Pitch/Small Pitch contests and other extracurricular business planning competitions. The survey of the GEP participants showed that the training accelerated intentions and actual start-ups of the trainees. More than half of them started up straight after the programme. At the same time, the start-up intentions of those who were not selected for GEP, were implemented among only one third of the applicants. Historically, the surviving companies from GEP 1985 created 4.3 full-time jobs on average (82 in total), and 2.8 part-time jobs; each firm from GEP 1986 created 3.6 jobs after 2.5 years, and from GEP 1987, 3.3 jobs after 1.5 years. Although this study stands out from others in terms of the data analysis method (i.e. simple statistical frequencies due to the lack of prior observations and follow-up data), which reduces the inferential value, it remains relevant for drawing out final conclusions, specifically relating to the importance of the selection procedure and the prior motivation of the students.

Clouse (1990) contributed to proving the effectiveness of EE by analysing student start-up decisions during a simulated venture creation exercise run as part of the entrepreneurship course at a Midwestern University (US). The assignment entitled the New Venture Start-Up Decision Making Exercise was pre-validated by entrepreneurs and professors. The participating students were majoring in business and previously completed a set of co-curricular management courses. The exercise was introduced in two rounds. During the first round, the students commonly worked in teams on business plan development for new ventures. During the second round, the simulation exercise, the students were given hypothetical

situations, and had to make decisions on market potential, long-term profitability and short-term cash-flow, resource availability, competitive pressures, and team management – 6 key areas of business formation, 36 different scenarios in total. A combined regression model with indicator variables representing both rounds of the exercise was formed for each student; differences between the administration rounds were tested. The results showed that the intervention had a statistically significant impact on the majority of students who simulated the new venture decision behaviour, since most of them changed their behaviour on one and more key decision criteria. Yet, the sample Clouse (1990) relies on is unrepresentative (N=47), a single exercise with no control group is evaluated, the evaluation is embedded in the students' grades, which makes the subjects personally interested in the outcome.

Charney and Libecap (2000) compared self-employment, start-up, and general employment dynamics of the 3-semester long Berger Entrepreneurship Programme graduates (N=105) and non-Berger graduates (N=406) from the University of Arizona, Eller College of Business and Public Administration. The Berger programme is well known for its experiential focus and exposing students to entrepreneurial life with core courses in competitive advantage, venture finance, market research, and business plan development. The measurement covered students graduated in 1985–1998 utilising a cross-sectional design with a control group, where the alumni were comparable via a set of demographic characteristics (age, gender, ethnicity, level of education, socio-economic status). Entrepreneurship graduates were 25% (3 times) more likely to be involved into new enterprises, 11% more likely to be self-employed than other graduates; they had higher income, were 13% and 9% more likely to work for high-tech firms and to be involved in new product development. Concurrently, non-Berger graduates were twice more likely to be employed in the public sector and non-profit organisations than Berger graduates. Despite the matched control group and random sampling, the sample is a bit unbalanced (a prevalence of non-Berger alumni) and includes both business and public administration majors. The reader is left uninformed about how many public administration majors are in the control group, how many bachelor students proceeded into the MBA and whether there were no differences between bachelor and master students taking the programme. In regard to the impact of the experiential intervention, the results still do not contribute to the practically non-existent evidence that would support the conventional wisdom.

Mixed measures

The two remaining examples of quantitative studies in the selection, Lange et al. (2011) and Kolvereid and Moen (1997), use mixed measures of EE outcomes: entrepreneurial intentions and start-ups.

Lange et al. (2011) drew upon a representative sample of almost 4,000 respondents from Babson College graduates. It used a binary logistic regression to test hypotheses concerning three groups of graduates: non-entrepreneurs, would-be entrepreneurs and entrepreneurs. An experiential intervention aimed to increase student entrepreneurial self-efficacy. Teaching methods employed targeted the development of four self-efficacy components – role modelling and vicarious experience, enactive mastery, social persuasion, judgements about one's self – and included case studies, visits by entrepreneurs, one-to-one interviewing of entrepreneurs, analysis of the learning process, working on consulting projects, business planning, business management simulations, and starting a company. The researchers compared the entrepreneurial intentions and actual start-up behaviour of students at the time of graduation and of alumni in 5-year intervals controlling for such variables as the number of entrepreneurship courses taken, parents-entrepreneurs, gender, prior proclivity to become an entrepreneur, and others. It appeared that taking two or more courses in entrepreneurship (not one though) strongly affected student and alumni intentions and their becoming entrepreneurs. This dependency was proved to be significant for both variables in the long-term, 10–15 years after graduation. Males were more likely to have entrepreneurial intentions and to become entrepreneurs. Prior intentions to pursue a career in entrepreneurship and founding a business before enrolling in Babson were also highly significant variables. No effect of parents-entrepreneurs was detected, similar to Wadhwa et al. (2009). A total of 913 alumni (24.2%), who founded or co-founded a company, were classified as entrepreneurs. Those businesses on average had annual revenue of USD 5.5 million, 27 employees, and were 5.5 years old. However, it remained unclear whether the latent intentions that the alumni had even 10–15 years after graduation ever transferred into tangible activity. Overall, the study by Lange et al. (2011) is quite convincing, in spite of the post-test design and unbalanced response rates from the groups of graduates.

Table 5b. Overview of EE impact studies by type of research and measures with details

I. Quantitative studies							
Source	Design	Sample	Method	Measures	Instrument	Intervention	Main result(s)
				Subjective measures			
<i>Graevenitz et al. (2010)</i>	Pre-test post-test, controls	196 BA business students, 21-22 y.o. (Germany)	Probit and OLS regressions	Intentions, attitudes, confidence, and skills	Multi-item constructs; validated by academics and students	Compulsory e-ship (business planning) course, 5 months, 3 rd semester of BA	Intentions declined, but positive effect on skills and self-confidence.
<i>Oosterbeek et al. (2010)</i>	Pre-test post-test, treatment and control groups	104 + 146 college business students, 20 y.o. (Netherlands)	Instrumental variable approach, difference-in-differences	Traits, skills and intentions	The Escan test, pre-validated, 114 items loading into 10 factors, plus 1-item intentions	Creation of mini-companies (compulsory), 1 academic year, part-time basis	Insignificant effect of the program on entrepreneurial skills and traits. Significantly negative effect on intentions.
<i>Sanchez (2011)</i>	Pre-test post-test, quasi-experimental	403 + 460 university mixed background students, mostly business; 22-23 y.o. (Spain), mostly BA-level	Regression analysis, one-way ANOVA, General Linear Modelling	Competences and self-employment intentions	Multi-item constructs from earlier studies (De Noble et al. 1999; Rohrmann 1997 etc.)	Entrepreneurship programme with business planning competitions, guest lectures, networking. 8 months (Oct-May, 2h a week) (free elective)	Major improvement in competences (self-efficacy, proactiveness, risk-taking) and intentions.
<i>Rauch and Hulsink (2014)</i>	Quasi-experimental, pre-test- post-test comparison (18-month lag)	Entrepreneurship and Logistics students (MSc) (Netherlands), 23-24 y.o.; T1: 96+57 / T2: 88+54 / T3: 62+12	One-way ANCOVA	Attitudes, perceived behavioural control plus intentions and behaviour	Multi-item constructs from earlier studies and a compilation from sources for behavioural items	Effectuation and experimentation vs. causation. 1 year, compulsory MSc programme	EE students showed significantly higher attitudes and perceived behavioural control, higher intentions and behaviour scores.
<i>Fayolle and Gailly (2013)</i>	Pre-test post-test and 6-month follow-up	158 management students (MA) (France), 25 y.o.	T-test, multivariate regressions	Intentions and antecedents (attitudes, subjective norms, behavioural control)	Ajzen's intention model, 32 Likert-scaled items based on Kolvereid (1996 a, b)	Awareness-raising programme, key concepts and workshops; evaluation of new start-up projects based on business plans; 24 hours of class time over 3 days	Positive impact on attitudes and behavioural control after 6 months, but not in post-test. Counter-effects on students with prior entrep. exposure and having parents-entrepreneurs.

Source	Design	Sample	Method	Measures	Instrument	Intervention	Main result(s)
<i>Soutitaris et al. (2007)</i>	Pre-test post-test quasi-experimental	Science and engineering students (UK and France), 124 taking the programme + 126 control; BA-level	One-way ANOVA, regression	Intentions, attitudes and nascenty	Multi-item constructs from earlier studies (Kolvereid 1996; Alsos and Kolvereid 1998)	Formal teaching, business planning, interaction with practice, university support. 5-6 months (compulsory or elective)	Subjective norm and self-employment intentions increased in the treatment group. Intentions were unrelated to nascenty. Inspiration was the key driver.
<i>Piperopoulos and Dimov (2014)</i>	Post-intervention survey at 4 elective e-ship courses	114 BA (2 nd year) and postgraduate students from one university (UK), 21 y.o.	Ordinary least squares (OLS) regression, probit model of the course choice	Self-efficacy and intentions	Self-efficacy scales from Lucas and Cooper (2004), 1-item intentions	2 practically- and 2 theoretically-oriented courses (self-directed, learning-by-doing vs. stand-and-deliver). 1 academic year (electives)	Positive relationship between self-efficacy and intentions in the practically-oriented courses and negative relationship in the theoretically-oriented.
Objective measures							
<i>Brown (1990)</i>	Pre-test post-test, controls, 3 years historical	214 e-ship BA, 75(19) control (UK)	Analysis of frequencies	Start-ups	Market research questionnaire during selection workshops and quarterly audit	Graduate Enterprise Programme (GEP) – entrepreneurial-directed alternative to traditional teaching, 4 months	GEP accelerated business start-ups, firms associated with 4-year operation of the programme generated relatively high sales and turnover.
<i>Clouse (1990)</i>	Pre-test post-test	47 venture creation course business students (US)	General Linear Modelling	New venture decision making behaviour	Literature review based, course feedback concerning the individual decision models	New Venture Start-Up Decision Making Exercise, simulated venture creation, practice-based, 2 times during 1-semester long course	The course had a statistically significant impact on the majority of students.
<i>Charmey and Libecap (2000)</i>	Post-test, control group	511 University of Arizona alumni: 105 (Berger) + 406 (non-Berger), BA (4 th year) and MA-level (2 nd year) (US)	Probit, OLS regressions	Start-ups, self-employment, income, performance	Newly developed for the study	Berger Entrepreneurship Programme; elective major; 3 semesters long	E-ship graduates are 25% more likely to be involved in start-ups and 11% more likely to own a business; their average income is 27% higher.

Source	Design	Sample	Method	Measures	Instrument	Intervention	Main result(s)
<i>Lange et al. (2011)</i>	Longitudinal study, post-test comparison at the time of graduation and long time after	3755 Babson College BA and MBA alumni, graduated 1985-2009 (US)	Binary logistic regression analysis	Mixed measures Intentions, full-time start-ups at graduation and afterwards	55-question survey (details from the authors)	Case studies, entrepreneurs' visits, consulting projects, business planning, field studies, mentoring, etc. 1 semester – 1 year	Taking 2 or > e-ship courses strongly affected graduates' decisions to pursue start-ups. EE is significant for both intentions and start-ups in the long-term. No effect of parents-entrepreneurs. Males more likely to intend and become entrepreneurs.
<i>Kohverid and Moen (1997)</i>	Post-test, control	105 business graduates with entrepreneurship major and 265 management majors (Norway), 28-29 y.o.	Multiple logistic regression, OLS regression	Start-ups and intentions	Intentions index based on 3 measures adopted from other studies (Brenner et al. 1999; Ajzen and Fishbein 1980), 1 question on start-ups	New business formation, innovation and strategy – key components. Focus on increasing awareness and small business development. 1 year	Entrepreneurship majors were more likely to start-up and have stronger entrepreneurial intentions.
II. Qualitative studies (only subjective measures)							
<i>Matlay (2008)</i>	Longitudinal, 10-year period, from 1997 to 2006	64 graduating students from 8 HEIs in the UK, 3 rd year BA, now acting entrepreneurs	Semi-structured in-depth telephone interviews conducted annually	Knowledge, skills	Self-evaluation questionnaire to assess knowledge and skills before and after EE, 8 topics (per course), 1-10 scale	A mixture of theoretical and practical courses, incl. business strategy, risk, marketing, marketing research, finance, HR, business planning, idea development	Positive impact on knowledge and skills required to embark on an entrepreneurial career. Speedy progression from self-employment into micro- and small business ownership.
<i>Mason and Arshed (2013)</i>	Post-intervention	Groups of 3, 4 or 5 BA students at the University of Strathclyde (UK) (N1=51, N2=71 groups)	Case study of an experiential learning assignment; thematic analysis	Intentions, motivations, capabilities	Students' reflections with no constraints (40% of the mark) + course evaluation	An experiential learning assignment on the 1 st year of entrepreneurship course – Value Challenge	Positive impact on intentions and personal development skills.

<i>Source</i>	<i>Design</i>	<i>Sample</i>	<i>Method</i>	<i>Measures</i>	<i>Instrument</i>	<i>Intervention</i>	<i>Main result(s)</i>
<i>Lackéus (2014)</i>	Longitudinal, in-depth exploratory – 9 months	3 MA engineering students, Chalmers School of Entrepreneurship (Sweden), non-random sampling	Case study: mobile app survey; semi-structured, interviews, content analysis	Competences, particularly attitudinal learning outcomes	Survey: 1-7 Likert, self-assessment of feelings and emotions to register + or – events. Interviews: 5 themes including emotions and competences.	Targeted tech-based venture creation programme, highly experiential, teachers with experience in pedagogy and entrepreneurship	Numerous links between emotional events and developed entrepreneurial competences. Interaction with outside world, uncertainty and ambiguity, teamwork experience as sources of emotions exhibited primary impact on the attitudinal outcomes.
<i>Giinzel-Jensen and Robinson (2014)</i>	Process-based	142 BA students, 29 groups; 3 rd semester (Denmark)	Single in-depth case study; open and thematic coding	Degree of progression, application and understanding of effectuation	Assignment on progression, reflection on the process of innovation	Organisational Innovation course, fully designed upon the effectuation process; lecture, group work, discussion, de-briefing; teachers experienced in both entrepreneurship and pedagogy; 10 ECTS	Four main barriers identified: 1) noviceness (as students, persons, entrepreneurs, team players); 2) school project vs. real-life project; 3) lack of trust; 4) perception of teachers.

Kolvereid and Moen's (1997) post-test comparison of entrepreneurial intentions and start-ups between entrepreneurship (N=105) and management (N=256) majors at master level proved that students majoring in entrepreneurship tend to have stronger entrepreneurial intentions and are more likely to start-up. The survey was conducted among Norwegian students graduating in 1987–1994 from the Bodø Graduate School of Business. The educational intervention was focused on entrepreneurship awareness building and small business development, not venture creation specifically. The logistic regression model of venture formation demonstrated that in a row of five variables related to education and experience (e.g. work experience prior to first degree, work experience between the first and second degree, additional formal education), majoring in entrepreneurship and years since graduation were the significant predictors. The results are convincing enough, because the authors addressed potential selection problems and controlled for a range of confounding variables. It was clearly shown that the sample is a representative of the alumni based on gender and the business school cohort (the number of graduates from each year was compared with the number of respondents from each class). Career history, annual income, work motivation, industry sector, gender and family status were controlled for, amongst other factors. That being said, previous research has shown the significance of prior positive attitudes and proclivity to become entrepreneurs before enrolling in a university while Kolvereid and Moen (1997) did not control for these factors. The quality dimension of the businesses established also remained uncovered.

3.2.2 Qualitative studies

Qualitative papers assessing the impact of EE are evidently fewer and newer as they started to gain momentum quite recently. From the methodological viewpoint, these papers open a different perspective on the evaluation of EE outcomes, often serving as an exploratory antidote to the quantitative studies with less stringent sampling procedures. Nonetheless, qualitative studies (e.g. Matlay 2008; Mason and Arshed 2013; Lackéus 2014), also tend to report positive results that support the effectiveness of EE in general and experiential EE in particular. More critical papers (e.g. Günzel-Jensen and Robinson 2014) are in the minority.

Matlay (2008) explored the impact of EE on entrepreneurial knowledge, skills and, to some extent, attitudes among 64 final year bachelor students from 8 HEIs in the UK. The study pursued a multiple case study design selecting two students from business, arts, engineering and computing faculties in each HEI. All the subjects were interested in becoming entrepreneurs and had prior commitment to

starting up after graduation; in other words, very positive previously established attitudes towards entrepreneurship that was their deliberate career choice. Fifty-nine (59) out of 64 were influenced by family members and other individuals in starting to prepare for entrepreneurial careers before their formal studies. Therefore, the selection procedure itself brings the purity of the findings in favour of EE into question regardless of the longitudinal design. The subjects were interviewed over a 10-year period before and after the EE intervention that was a mixture of theoretical and practical courses, including business strategy, marketing research, business planning and idea development, among others. Evaluation of the progression from graduation to entrepreneurship based on the respondents' answers showed the positive impact on knowledge and skills required to embark on an entrepreneurial career after the intervention. Before the intervention, most of these respondents possessed average knowledge and very low specific entrepreneurial skills. The assessment of the impact upon the entrepreneurial career showed speedy progression from self-employment (i.e. sole trader) one year after graduation into micro- and small business ownership five and ten years after. Although the study results attribute the progression outcomes to EE, the connection is not clear-cut, especially in relation to the long-term progression.

Lackéus (2014) investigated the link between emotions and attitudinal learning outcomes in the highly experiential EE programme at the Chalmers University of Technology specifically targeted at tech-based venture creation. The sample included engineering students of heterogeneous background (industrial management, electrical engineering, biotechnology), who had no previous experience of starting and running a business or even EE. The study employed a non-random qualitative sampling strategy. Again, the selection was based on the subjects' interest in participating as well as gender, and attitudinal and trait-based values. By employing a longitudinal research design that combined a mobile app survey of five students and semi-structured interviews with three students, the study concluded that such sources of emotions as interaction with an outside world, uncertainty and ambiguity in learning environment, and team work experience are particularly linked to increased attitudinal learning outcomes, to a greater extent including: self-efficacy, self-insight, ambiguity tolerance, entrepreneurial identity development and passion. While the findings of this qualitative study indicate a positive connection between experiential EE and perceived attitudinal outcomes, it does not differentiate between the influence of experiential and traditional EE. Notably, it is also limited to affective measures, relies on a relatively small and slightly biased sample.

Similar to Lackéus (2014), the papers by Mason and Arshed (2013) and Günzel-Jensen and Robinson (2014) analyse experiential interventions as in-depth case studies. The former discusses the results of a special assignment for first year bachelor students entitled Value Challenge. The latter, unlike other studies, attempts to explain why students pre-motivated to become effectual struggled to apply, understand, and deeply reflect on the effectuation principles.

The Value Challenge is a compulsory assignment in the first year entrepreneurship class at the University of Strathclyde (UK) adapted from the Jim Morgan Institute at the University of Florida. The assignment requires bachelor students working in groups of 3, 4 or 5 given little initial investment per team (GBP 20) to create an entrepreneurial activity that would generate financial value. The total sample analysed included 122 groups from two consecutive academic years, who were asked to reflect upon a guiding question “What have you learnt?” both individually and in groups. The thematic analysis of the reflections by the researchers showed a positive impact on intentions and personal development skills, better understanding of concepts put into practice immediately after lectures, insights regarding entrepreneurship fundamentals, and the ability to deal with failures. Irrespective of the positive results reported, there are a number of concerns related to the study design. Taking into consideration the challenging nature of the exercise and novice quality of the study subjects, the absence of negative results (e.g. decreased entrepreneurial intentions or learning difficulties that could not be overcome) might be an alarming sign, hinting at a compromised assessment for the following reasons. The group reports and learning reflections were graded. Hence, the students could be overly positivistic about their experiences to please the educators. Although it is not specified directly, it seems that the researchers were also educators in charge of the entrepreneurship course, meaning they might have held a personal interest in the positivity of the outcomes. A much greater variability in the students’ perceptions of learning would be expected.

Günzel-Jensen and Robinson’s (2014) qualitative analysis is a purposeful exploration of the reasons why, despite effectuation being highly consistent with experiential learning, its application might not bring the intended results. The starting point for the critique of effectuation as the dominant student-centred logic of EE was an observation by educators that undergraduate students fail to benefit from effectuation principles in an entrepreneurial innovation process. The intervention made students, who worked in randomly assigned groups of four or five people, to proceed from a field of interest to a business idea. The course was run by four educators experienced in both entrepreneurship and pedagogy but they did not interfere when insecurities and difficulties in learning arose, acting as

independent observers of the students' reactions. The analysis relied on one voluntary and two mandatory assessments of the students, evaluations by the students, and teacher observations. As a result, four main reasons why the learners struggled to apply effectuation were highlighted: 1) they were novices, as students, individuals, entrepreneurs, team players; 2) they kept perceiving the course as a school project rather than a real-life project and found it mentally hard to switch from causal to effectual logic; 3) lack of trust in teams, teachers and the learning process, which increased the feeling of frustration and insecurity; 4) perception of teachers – when they altered the course processes and content on the go, based on the students' weekly reflections, this served as a sign of the teachers' weakness for the students. Even though the paper did not provide detailed information on the intervention content, the barriers identified serve as a timely caution for applying effectuation among undergraduates. They represent qualitative factors that educators should pay closer attention to when designing experiential interventions. In that sense, the work of Günzel-Jensen and Robinson indeed stands out from the other studies because its findings question the dominant rhetoric.

3.2.3 Systematic reviews and meta-analyses

The selected systematic literature reviews and meta-analyses contribute a critical view of the broader scope of EE impact studies than this chapter has covered so far. Noticeably, they either reiterate that reported outcomes are positive (e.g. Pittaway and Cope 2007; Dickson et al. 2008), or question the trustworthiness of previous findings by appealing to methodological flaws (e.g. Rideout and Gray 2013; Henry et al. 2005; as well as Martin et al. 2013).

Pittaway and Cope (2007) present the results of a multi-stage systematic literature review process, including selection and analysis of citation indexes of 61 journals dated from 1980 to 2004 performed with thematic coding in NVivo. The authors found that EE has an impact on student entrepreneurial propensity and intentionality, but the extent to which it influences the level of graduate entrepreneurship or helps graduates becoming more successful entrepreneurs remains unclear. The analysis suggests that graduate entrepreneurship can be promoted, for example, through experiential learning (e.g. e-mentoring, student projects with small firms, internships and placements), early-stage financing and access to mentoring, yet the degree of its influence is unknown. The paper can be considered exceptional not only because it was cited almost four hundred times, but mainly because it also brings up the importance of the external and internal dimensions discussed in the previous chapter holistically; in other words, including

the general EE policy context (government initiatives), the university enterprise context (institutional culture and entrepreneurial environment), and the programme context (how EE is delivered) for attaining the outcomes targeted.

Dickson et al. (2008) conducted an analysis of 49 peer-reviewed research papers published in various journals and proceedings between 1995 and 2006. The two-fold aim included the investigation of the link between both general and entrepreneurship education with venture creation and success. Evidence was found supporting the relationship between levels of general education and entrepreneurial success measures (profitability, growth, innovation), consonant with Robinson and Sexton (1994). However, the connection between general education and the choice of becoming an entrepreneur was less clear and somewhat diverges from the more recent findings of Block et al. (2011) as well as Robinson and Sexton (1994). Fifteen papers on EE analysed, including the previously discussed studies by Charney and Libecap (2000) and Kolvareid and Moen (1997), suggested a positive link between EE and venture founding. By the same token, EE proves to positively impact intentions, self-efficacy, opportunity recognition, knowledge as well as the psychological traits of participants. In spite of the fact that these findings echo the quantitative studies discussed earlier in the chapter, it should be noted that the links emphasised do not necessarily imply causation. A similar argument applies to the next study.

A comprehensive meta-analytical review by Martin et al. (2013) combined 42 independent samples (N=16657). The study compared the relationship of EE with entrepreneurship-related human capital assets and entrepreneurship outcomes, where the former were expressed as knowledge, skills, perceptions (i.e. attitudes) and intentions, but the latter as entrepreneurial behaviours (nascent and start-up) and business performance (financial performance, personal income of owners, duration of success). EE was found to be positively associated with both types of outcomes. Furthermore, the association of academic-focused EE interventions with entrepreneurship outcomes was significantly stronger than that of training-focused interventions. The association of training-focused EE with entrepreneurship-related human capital assets was not substantially more positive than in the case of academic-focused EE, contrary to one of the study's hypotheses. All the associations were correlation-based. However, the distinction that the authors make between the two forms of interventions is anchored in the intervention volume – either a short training course focusing on core knowledge and skills related to starting up a company or a full academic course providing a broader theoretical and conceptual understanding of entrepreneurship topics (e.g. identification of opportunities, causation and effectuation). Therefore, some interventions that could

be classified as experiential (e.g. Oosterbeek et al. 2010), were labelled as academic-focused. Apart from yet another confirmation of the positive trends in the reported EE impact, Martin et al. (2013) come up with the conclusion that less rigorous studies, which happen to be in the majority, usually overestimate this impact. Post-test measurements only or the absence of control groups reduce the accuracy of the positive claims.

A discussion paper on the teachability and effectiveness of EE by Henry et al. (2005) also points out basic the methodological deficiencies of the impact measurement. Apart from self-selection biases or special admission criteria in some programmes, unmatched control groups, difficulties with determining causality and sample representativeness, the authors underline the drawbacks of subjective assessments. Notwithstanding the fact that self-reports are the most popular, respondents may exaggerate their answers. The personal characteristics of the respondents are usually not accounted for in these studies. In addition, as follows from the review by Martin et al. (2013) and also from Rideout and Gray (2013), the most evident drawback in impact measurement studies at present is the absence of longitudinal research using a classical experimental design, which is hard to implement for known reasons. What is debatable in the discussion paper, however, is the statement that comparisons with non-participation in EE serve as the only true indication of impact. This would arguably depend on the research aim, and what needs to be captured. Numerous studies demonstrate (e.g. Rauch and Hulsink 2014; Oosterbeek et al. 2010; Charney and Libecap 2000) a comparison of participants in EE with non-participants does not yield much evidence on the impact of experiential EE. Moreover, as the authors notice, the evaluation is often performed separately from the programme objectives, content, and structure, let alone the entrepreneurship pedagogy employed, whilst these dimensions are inextricably connected. With respect to teachability, the answer is not definitive in light of the methodological concerns. At least some aspects associated with entrepreneurship can be taught and learnt or developed systematically through education. Nevertheless, educators might not be able to “*create entrepreneurs any more than they can produce step-by-step recipes for entrepreneurial success*” (p.164).

Consonant with the more critical perspective, Rideout and Gray (2013) undermine the widespread confidence that EE really works; that is, produces entrepreneurship. In the comprehensive review and methodological critique of 12 robust empirical studies on the impact of university-based EE published from 1997 to 2011, the authors discuss inferential weaknesses in the research designs. The robustness implied quasi-experimental studies or those that used “*minimal*

counterfactual comparison including pre-test post-test or comparison group design” were included in the systematic review (p. 344). The selection of studies also comprises the papers of Kolvereid and Moen (1997), Charney and Libecap (2000), Brown (1990), Sanchez (2011), and Souitaris et al. (2007). In general, the methodological deficiencies brought up by the authors mirror those already discussed in Henry et al.’s paper (2005) as well as in conjunction with other studies, yet, interpretations of the findings and conclusions are more critical. Rideout and Gray (2013) examine the selected papers with respect to psychosocial and objective outcomes, 5 and 7 studies, respectively. They find modest support in favour of an increase in self-efficacy, and weak support for intentions expressing concerns about inferentially weak pre-test post-test designs. Even if EE affects internal psychological processes, it is not only what policy makers expect of it, while “*none of the studies used the kind of robust statistical methodology (e.g. SEM) that might help clear up the linkage EE interventions - psychosocial mediators - objective outcomes*” (p. 345). The latter are still consistently positive, suggesting that EE can be an effective vehicle for promoting economic development goals. However, the value of these findings is negated by post-test only comparison group design that undermined the confidence in cause-effect relationships and through flaws spotted in the matching process. All the critical arguments taken together lead to the conclusion that we do not really know for certain whether it is EE that causes the positive effects.

Does experiential EE work?

A number of quantitative papers demonstrate that students with an entrepreneurship-related background (e.g. business, management, logistics) who study entrepreneurship tend to be better off in terms of subjective measures of EE (e.g. Rauch and Hulsink 2014; Sanchez 2011) or even objective measures (e.g. Charney and Libecap 2000; Brown 1990; Clouse 1990) than those who do not study entrepreneurship. The same finding applies to non-business students as well as business students studying or majoring in entrepreneurship (in comparison to other majors) (e.g. Souitaris et al. 2007; Kolvereid and Moen 1997). However, these studies do not especially take into consideration the form of EE intervention. Positive results in the overviewed quasi-experimental, longitudinal or comparative studies appear to be rather obvious for the design reasons discussed earlier, and say almost nothing about the effectiveness of experiential EE compared to traditional.

The overview conducted tends to include studies that draw upon (predominantly) experiential EE interventions: Rauch and Hulsink (2014), Lange et al. (2011), Oosterbeek et al. (2010), Charney and Libecap (2000), Brown (1990),

Piperopoulos and Dimov (2014), among others. However, the research design of the aforementioned studies (except for the latter) do not delineate experiential EE from traditional. Therefore, the positive effects can be attributable to the form of intervention only hypothetically. The robust study by Oosterbeek et al. (2010) suggests that the outcomes can also be rather unexpected. Consonant with this, Martin et al. (2013) conclude that less rigorous papers tend to overestimate the impact of EE. Distinguishing between the effects of traditional and experiential interventions is crucial, since the question of educational outcomes is inseparable from the form of EE predicated upon the teaching aims, methods, audiences and other dimensions (e.g. Fayolle and Gailly 2008; Béchard and Grégoire 2005b; Henry et al. 2005).

Despite the overwhelming recognition of the experiential approach as the most appropriate and fertile, EE researchers still know little about the quantifiable impact of experiential compared to traditional learning in EE. Whilst it is often taken for granted that highly experiential EE governed by the social constructivist learning paradigm produces superior outcomes or better impact, this assertion is not supported by sufficient empirical evidence.

3.3 Impact of activity-based learning in other disciplines

In view of the paucity of evidence on the impact or outcomes of experiential EE, comparable research of similar problems in other disciplines could prove useful. Five extra studies found using Google Scholar were subject to a brief overview: Freeman et al. (2014), Deslauriers et al. (2011), Pugsley and Clayton (2003), Specht and Sandlin (1991) and Dubin and Taveggia (1968). The described interventions were all performed in classroom settings and employed interactive, problem-based or active learning methods. The communicated results also rely on post-test measurements, relatively simple statistical tests (e.g. t-test, ANOVA) or descriptive statistics except for the most recent study that used the random effects model.

Freeman et al. (2014) meta-analysed 225 studies that compared the performance of undergraduate students in STEM (science, technology, engineering and math) courses delivered through traditional lecturing and active learning methods. Active learning was defined as “*engaging students in the process of learning through activities and/or discussion in class as opposed to passively listening to an expert*” (p. 8413). Traditional lecturing was defined as “*continuous exposition by a teacher*” limiting the students to taking notes and asking occasional questions (p. 8413). The results showed the large and consistent impact of active learning.

The overall mean effect size for performance on identical or equivalent examinations, understanding and the use of scientific concepts was a standardised difference of 0.47. This meant that student performance increased by nearly a half of a standard deviation in the case of active learning (equivalent to an increase of 0.3 in a final grade, or an increase from B to B+ in the letter system). The ratio for failures was 1.95 under traditional lecturing, meaning that students in traditional lecture courses were 1.5 times more likely to fail. The analysis also concluded that the results were not subject to a publication bias. Moreover, there was no indication that the effectiveness of different teaching methods is instructor-dependent.

Deslauriers et al. (2011) compared two groups of undergraduate students in physics ($N_1 = 267$ and $N_2 = 271$). Knowledge of a specific set of topics was assessed by means of a voluntary test positioned as useful exam practice. Both groups already had 11-weeks of traditional physics classes. On the 12th week, one of the groups underwent a 3-hour instruction by a trained but inexperienced teacher whose practice was grounded in deliberate research-based activities, namely, problem solving, discussion and group work. The second group had a traditional 3-hour long lecture by an experienced and well-known instructor. The researchers registered higher student attendance, engagement, and more than twice higher learning scores in the first group. The study also triggers a discussion on whether experienced instructors should be recruited to deliver activity-based teaching.

Pugsley and Clayton (2003) found that perceptions and attitudes towards nursing research were significantly higher in a group of nursing students taught using more interactive methods ($N=25$); that is, hands-on problem solving, research projects, critique homework, classroom discussions, than in a group taught through traditional lectures ($N=19$). The intervention in both cases was 2 ECTS worth. Apart from small samples and a simple T-test employed to compare results, the sampling strategy was undermined by the fact that the treatment group consisted of junior-level students, but the control group of senior-level students. Over 90% of the respondents were females, which can be deemed natural for the field of nursing.

On the other side of the scale, Specht and Sandlin (1991) reported no significant differences in knowledge between 46 undergraduate accounting students taught traditionally and using problem-based learning immediately after the intervention. Six weeks after the intervention, however, a significant decrease in the scores of the first group ($N=24$) and no change in the treatment group ($N=22$) were registered. The results were measured using compulsory quizzes aiming to test short- and long-term memory retention of general and specific accounting concepts, and were administered to both groups. The clash of expectations is even more pronounced once the intervention is inspected in more detail. The course

content in both cases was focused around the identification and use of financial ratios for lending decisions. The treatment group students were exposed to a theoretical lecture, problem solving, case studies and group discussions with an instructor, while the control group only had lectures and the case analysis presented in lecture format. One would expect higher results from the treatment group in the described learning settings.

The research by Dubin and Taveggia (1968) communicated the most intriguing and thought-provoking results, given the scope. Although it is a rather old study, the findings question our present assumptions. The authors systematically reanalysed data from nearly 100 comparative studies of different college teaching methods in the US. The range of teaching methods was quite narrow; that is, lectures, in-class discussions, and supervised and unsupervised independent study, but the conclusion reached was surprising enough: “*no shred of evidence was found to indicate any basis for preferring one teaching method over another as measured by the performance of the students in course examinations*”.

In the context of teaching models, the findings of the five studies from other disciplines suggest that even in-class active learning methods may bring about different outcomes among undergraduate level students. Notably, based on the details of the interventions observed here in accounting, nursing and STEM disciplines, the essence of experiential learning was narrowed down to activity-based learning; that is, active engagement versus passive listening. Nevertheless, similar disparities might be present in EE once more empirical evidence is collected. The existence of varying results is quite natural, however – some programmes are more effective, others less. The turning point is to identify critical success or failure factors to turn less effective interventions into successful ones.

3.4 Is the target anything an intervention happens to hit?

EE is often viewed as an effective way of facilitating the transition of students from education to business life. The underlying premise is that university EE “*can positively influence graduate attitudes towards entrepreneurship and equip nascent entrepreneurs with the necessary knowledge and skills to start up, manage and develop economically viable businesses*” (Matlay 2006:711). The baseline discussion on teachability suggests entrepreneurship can be nurtured through education and at least some of its aspects can be learnt.

In spite of the vastly positive evidence, this is not enough to convince critical minds that EE causes the desired effects. *The tendency to report only positive effects* is one of the five major observations the conducted literature review yielded,

the second and third being *over-reliance on subjective measures* (mainly intentions) and *the lack of matching between the outcomes measured and objectives of the EE interventions or those of educators*. Then, the evidence of superior outcomes of *experiential EE compared to traditional EE is clearly lacking*. Last, but not least, we still question *how objective outcomes of EE are linked to various entrepreneurship-related human capital assets*; for example, whether and to what extent entrepreneurial competences acquired during EE determine the behaviour of graduates in both private and corporate settings. The link between intentions and behaviour is already a rather crowded theme in EE research.

Out of 21 studies viewed, including meta-analyses, only 2 albeit well-designed studies reported diminishing effects pertaining to entrepreneurial intentions (Graevenitz et al. 2010; Oosterbeek et al. 2010). The qualitative papers that used subjective measures resonate with the quantitative papers in reporting positive findings. It might well occur that researchers tend to report confirmatory rather than opposing results due to a publication bias. Yet, dependent on the study programme specificities, audiences and teaching methods, a negative impact (e.g. declined self-efficacy and intentions) can be a feasible outcome when it comes to entrepreneurial learning. Even meta-analytical studies covering large samples, such as the work by Martin et al. (2013), confirming a positive association between EE and both entrepreneurship-related human capital assets and entrepreneurship outcomes, deserve some critical comments because they combine datasets built with different aims and conceptual backgrounds. Other reasons for the prevailingly positive findings might relate to the lack of control groups, the lack of longitudinal and experimental designs as well as of the objective measures.

An absolute majority of the studies used entrepreneurial intentions as the key measure of EE outcomes or impact. Intentions still maintain the leading position in the impact measurement arena irrespective of the fact that 70% of the variance in subsequent behaviour remains unexplained (Ajzen 1987) and the long-term destiny of intentions is unclear (e.g. Lange et al. 2011). Subjectivity intrinsic to self-reported measures (i.e. perceived levels of intentions, knowledge, skills or attitudes) is sometimes viewed as disadvantageous. Admittedly, subjective measures have become as customary as they are convenient to employ. It is, however, not the subjectivity of these measures that is rendered problematic, but rather the over-reliance on them. Amidst the tendency to overestimate, it is almost intuitive to expect that perceptions of oneself and one's own competences change as a result of educational interventions that move the learner from state A to state B. In this light, to consider the prior aspirations and intentions of learners that prove to influence the results of the impact of EE measurement appears crucial (see, for

example, Fayolle and Gailly 2013, Lange et al. 2011, Piperopoulos and Dimov 2014, and Brown 1990). Consequently, the designs that do not control for prior competences raise legitimate doubts.

Furthermore, a discrepancy between the programme objectives, and the aims of educators, students and researchers may exist, which a single study can hardly capture. Entrepreneurship educators might want to increase awareness about entrepreneurship, generate more start-ups, induce entrepreneurial behaviour or just inspire. Formal curricular aims can match or mismatch those aims, while some students might be just willing to get their grade or pass and “off they go”. As for the researchers, they often face the reality of being unable to embrace the numerous variables to consider in varying settings let alone account for the different aims of the EE stakeholders. In some cases, the researchers may even measure EE effects in an ad hoc manner, when there is an opportunity to write and publish about it. The contention is to take the diversity of EE stakeholder aims into account, when evaluating the outcomes or impact and interpreting the results. At the most basic level, impact researchers should consider the aims entrepreneurship educators set for the interventions studied. Otherwise, the target is anything an intervention happens to hit (Harrison and Leitch 1996, in Henry et al. 2007).

The discussed methodological constraints taken together bring a fair amount of inconclusiveness to the realm of EE impact. Even fine-grained studies face a certain amount of critique. Eventually, it becomes a matter of belief other researchers and educators grant to the projects undertaken by their colleagues and fellows. Because research and teaching support and inform each other, EE researchers and educators alike face a number of challenges. Ideally, they should work together closely to unpack multiple possible influences on learners and figure out the most effective teaching strategies to confront and transform the negative results into positive results.

On the measurement side, it is crucial to shift away from subjective measures towards mixed measures of EE outcomes. This implies the application of longitudinal design and following up graduates at several intervals after EE. It is equally important to profile individual personality orientations and prior individual competences that might be associated with a self-selection bias. Quasi-experimental designs are more realistic but not less challenging to pursue. Other types of design make it harder to establish causality, especially if there is no control group or it is unmatched. As long as the principal determinants are considered, control groups are matched, self-selection and non-response biases are addressed, models function.

On the education side, equally important for the researchers, the evaluation of EE outcomes calls for addressing major research gaps related to experiential EE and the association between the entrepreneurial human capital acquired in the EE process with objective outcomes expressed in the entrepreneurship domain. In particular, the outcomes that go beyond private venture creation such as employability and intrapreneurship are becoming increasingly important. For the educators, it is crucial to understand whether their practice brings about desired outcomes and what reasons are behind potential failures as they try out new experiential learning methods. The common challenge and opportunity is to integrate curricular evaluation approaches that are expected to facilitate constructivist learning (e.g. learning diaries, reflections) into on-going research practice.

4 EVALUATING THE OUTCOMES OF ENTREPRENEURSHIP EDUCATION – THE INTEGRATIVE FRAMEWORK

This chapter is the culmination of the monograph's theoretical part. Principal standpoints from the earlier discussions are synthesised and developed in devising an integrative framework for evaluating the outcomes of EE, and formulating the hypotheses for the study. The framework puts together: 1) learning outcomes of EE; 2) objective outcomes of EE, or expressions of entrepreneurial behaviour; and 3) teaching models in EE. The chapter unleashes novel aspects of the framework pertaining to the subjective and objective measures as well as the forms of EE interventions for further empirical exploration. It refers to the term “outcomes” rather than “impact” following Fisher et al. (2008), Martin et al. (2013) and Rideout and Gray (2013).

Firstly, in contrast to the majority of papers on the impact of EE theoretically grounded in psychology (as in entrepreneurial intentionality models), this dissertation draws upon general education and labour economics theories, namely, Bloom's taxonomy of educational objectives (Bloom et al. 1956), the tripartite competence framework tightly related to it (Heder et al 2011; Kraiger et al. 1993), and human capital theory (Becker 1975). Secondly, as the critical overview in the previous chapter shows, objective measures of EE outcomes are often limited to nascent entrepreneurship, number of established enterprises, and related performance indicators, omitting such important outcomes as intrapreneurship and employability. The integrative framework takes a more holistic view and incorporates these key objective expressions of entrepreneurial behaviour relevant for many entrepreneurship courses and programmes as potential outcomes of EE. It also compensates for the disproportionately fewer top-notch papers relying on objective measures rather than subjective measures relative to its immediate importance for economic and societal growth. Thirdly, the framework conceptually connects the learning outcomes formed in the domain of education to the objective expressions of entrepreneurial behaviour in the domain of entrepreneurship. Last but not least, the framework gives due account to the forms of EE interventions through explicit recognition of the teaching models. It argues in favour of the

necessity to closely consider the dimensional characteristics of EE interventions when evaluating the outcomes.

The integrative framework is primarily devoted to evaluating the outcomes of EE, but also touches upon the effectiveness and efficiency of EE (Kraiger et al. 1993). Evaluation refers to a research system of assessment of whether students achieved certain outcomes. It usually covers questions of measurement and instructional design, and the attainment of the educational objectives. Effectiveness seeks to explain *why* certain outcomes were achieved or not. It considers the effects of organisational, individual and education-related factors on learning and the transfer of learning (ibid 1993). Efficiency gauges the outputs in relation to the inputs – the cost-effectiveness of an intervention. The framework will be employed to assess perceived changes in competences and the aforementioned objective expressions of entrepreneurial behaviour expected to be induced by EE in short and mid-term periods.

4.1 Entrepreneurial competences as learning outcomes of EE

Wennekers and Thurik (1999) present a synthesis of the factors at the individual, firm and macro level which link entrepreneurship to economic growth, whereby individual-level competences are placed among the key critical elements leading to the formation of start-ups, innovation, job creation, and entries into new markets through entrepreneurial actions. Understanding what competences are naturally varies. In this work, entrepreneurial competences acquired during EE are defined as the combination of cognitive, skill-based and affective outcomes following education theory (Krathwohl 2002; Kraiger et al. 1993; Bloom et al. 1956) as well as the European Competence Framework (EU 2006; Heder et al. 2011). EE is expected to mould entrepreneurial individuals and prospective entrepreneurs by developing respective competences, which enable entrepreneurial behaviour in the context of setting up the subject's own or corporate ventures, or in a more generic life context. These are principal bets policy makers, educators and management of higher education institutions (HEIs) place in supporting and expanding EE. The influence of EE on the triad of competences, however, has gained much less attention from researchers than entrepreneurial intentions and self-efficacy among the subjective measures.

Individual behaviour that expresses in the entrepreneurship domain is “*the proximal outcome of the cognitions and emotions of entrepreneurial actors*”, according to Bird and Schjoedt (2009:327). So far, EE literature has extensively

focused on intentions that are based on widely accepted theories imported from psychology: theory of planned behaviour (Ajzen 1991; Ajzen 1987), Shapero's model of entrepreneurial events (Shapero 1982), and the social learning theory of self-regulation (Bandura 1991). Perceived desirability that includes attitudes toward the outcomes of behaviour and social norms, perceived behavioural control or feasibility related to self-efficacy amongst other antecedents of entrepreneurial intentions and subsequent start-up behaviour consistently demonstrate empirically robust results (e.g. Iakovleva et al. 2011; Krueger et al. 2000; Boyd and Vozikis 1994). Yet, intentions, classically defined as "*the cognitive state temporarily and causally prior to action*" (Krueger 2009:51), have notable limitations from the educational angle. Even though being a powerful measure, they still do not cover what students know and are able to do by the end of an educational treatment.

The intentionality models as such tend to be predominantly driven by the affective and conative processes of the human mind that concern emotions, self-efficacy, motivation, the desirability of performing behaviour (Kyrö 2008; Hilgard 1980) corresponding to affective learning (Fisher et al. 2008). Cognitive processes that regulate declarative and procedural knowledge, put another way, knowledge and skills corresponding to cognitive and skill-based learning, remain underexplored. This can be treated as a limitation insofar as the competences developed throughout the educational process jointly enable entrepreneurial behaviour (though are not behaviours themselves) (Bird and Schjoedt 2009). The application of the task-based entrepreneurial self-efficacy (self-confidence in the ability to perform tasks relevant for becoming and being an entrepreneur) closely related to the perceived outcomes of skill-based learning is quite common in the literature (e.g. Lorz 2011; Barakat et al. 2011; De Noble et al. 1999). Nevertheless, one study does not usually capture entrepreneurial competences holistically, considering various types of learning and the outcomes associated with them.

4.1.1 Bloom's taxonomy, types of learning and competences

An alternative approach to assessing the influence of EE is known as the tripartite competence framework rooted in a taxonomy of general educational objectives. Developed by the American psychologist Benjamin Bloom, the taxonomy dealt with three types of learning: cognitive, affective and psycho-motor for developing, accordingly, knowledge or an understanding of the subject matter, positive attitude and willingness to learn and act within that area, subject-related physical or psychological skills. Gagné (1984) came up with similar ideas for categorising the cognition of learners and the need to examine various domains of learning: verbal information, intellectual and motor skills, attitude and cognitive strategy. Teachers

were recommended to construct more holistic lessons by exposing students to the tasks that trigger all types of learning. This diversity was aimed at creating more well-rounded learning experiences, more neural networks and memory pathways in students' minds. The work of Bloom et al. (1956, 1964), and its recent revision (Krathwohl 2002) beyond just classifying the types of learning and their constituents, assumed an ascending order of complexity *within every type* so that each level required mastery at lower levels. For example, cognitive learning started with building up basic knowledge, and the ability to remember material; this then proceeded to understanding and interpreting the learnt information followed by analysis and application of the learnt material in new situations. This has been extensively used for writing learning outcomes in general education (Kennedy et al. 2006; Kraiger et al. 1993), where the priority emphasis rests with the cognitive domain.

In the 1990s, the taxonomy was adapted by Kraiger et al. (1993) for assessing the learning outcomes of training. The conceptual paper advocates a construct-oriented (i.e. multi-item) approach to developing training evaluation measures that would capture the multi-dimensionality of learning. It interprets cognitive outcomes as a class of variables related to declarative knowledge, knowledge organisation/integration (mental models), and cognitive strategies (self-insight and self-regulation). Skill-based outcomes comprise variables related to composition (e.g. generalisation, strengthening), proceduralisation, and automaticity (e.g. attention, tuning). Affective outcomes entail attitudinal (e.g. strength, self-awareness) and motivational / volitional variables (e.g. self-efficacy, goal-setting). The term "learning construct" refers both to a final state and a process of achieving the state, where learning is a function of changes in cognitive, skill-based and affective states (ibid 1993). The proposed adaptation also deals with quite generic components applicable to any discipline, but suggests a slightly different hierarchy of the learning types than in the original taxonomy. Table 6 outlines the composition of Bloom's taxonomy and the adaptation of it by Kraiger et al.

The three types of learning are either conceptually coincidental or causal of the tripartite classification of mental activities into cognition, conation and affection (Hilgard 1980). Knowing, feeling and willing date back to the ancient philosophy of Aristotle, while its modern origins can be found in 18th century German psychology (ibid 1980). Johann Tetens, "the father of psychology", who acknowledged the trilogy of mind, also distinguished experience as the basis for

Table 6. Bloom's taxonomy and its adaptation by Kraiger et al.

Bloom et al. (1956; 1964) / Krathwohl (2002)		Kraiger et al. (1993)	
<i>1. Cognitive learning</i>			
Knowledge	The ability to recall or remember facts without necessarily understanding them.	Declarative knowledge	Information about what: verbally-based, task-relevant knowledge
Comprehension	The ability to understand and interpret learned information.	Mental models	Cognitive maps developed by trainees to organise and integrate received knowledge
Application	The ability to use learned material in new situations	Metacognitive skills, self-insight	Knowledge of one's own cognition: planning, monitoring and revising goal-appropriate behaviour; self-regulation, self-control and self-assessment
Analysis/Synthesis/Creation	The ability to break down information into its components. The ability to put parts together, make an original product.		
Evaluation	The ability to judge the value of material for a given purpose.		
<i>2. Affective learning</i>			
Receiving	A willingness to receive information.	Composition	Mental grouping of steps by linking earlier learned procedures into a more complex production.
Responding	Active participating in own learning.	Proceduralisation	Building discrete behaviour into a routine; procedural knowledge
Valuing	Acceptance and commitment to chosen values.	Automatic processing, tuning	A shift from controlled to automatic processing; enables task accomplishment without verbalisation; improved accuracy, generalised applicability
Organisation	Refers to the process that individuals go through as they bring together different values.		
Characterisation	The individual has a value system in terms of beliefs, ideas and attitudes that control behaviour in a consistent manner.		
<i>3. Psycho-motor learning</i>			
Imitation	Observing the behaviour of another person and copying this behaviour.	Targeted object, attitude strength	Organisational commitment, creative individualism, tolerance of diversity, inner growth, self-awareness, changing values, behavioural modelling
Manipulation	Ability to perform certain actions by following instructions and practicing skills.	Motivational disposition, self-efficacy, goal-setting	Mastery and performance orientation, perception of own capabilities to perform endeavours; motivated behaviour, expertise
Precision	The ability to carry out a task with few errors.		
Articulation	Ability to co-ordinate a series of actions by combining two or more skills.		
Naturalisation	A high level of performance naturally ("without thinking").		

psychological method: “*the modifications of the soul are to be accepted as they become known through inner experience*” (Brett 1921: 328, in Hilgard 1980). Within this trilogy, both cognitive and skill-based learning refer to the cognitive faculty of the mind, and affective learning refers to conative and affective faculties. In the beginning of the 20th century, Allport (1935; in Brännback et al. 2007) demonstrated empirically that this “*troika tended to be inter-correlated strongly*” (p.112), and argued that behaviour occurs only when all three predictors are in place.

The triad of learning outcomes informs contemporary frameworks of competences, which are gradually shifting towards more holistic typologies (Lans et al. 2008). In the European Competence Framework (ECF), for instance, cognitive outcomes stand for knowledge about entrepreneurship, and affective and skill-based outcomes, for entrepreneurial attitude and skills, jointly referred to as competences (Gibcus et al. 2012; Heder et al. 2011). The European Qualifications Framework (EQF) interprets “competences” in a more narrow sense and sets them together with knowledge and skills jointly referred to as “learning outcomes” – what a learner knows, understands and is able to do upon completion of a study process (EU 2008; Grün et al. 2009; Helgoy and Homme 2011). The triad of competences is often referred to in the European policy documents (e.g. Gibcus et al. 2012; McCoshan et al. 2010; EC 2007; EU 2006) and in publications by individual authors (e.g. Lackéus 2014; Mets 2010; Lans et al. 2008; Matlay 2006).

In relation to another tripartite approach that could be used in writing learning outcomes, namely, Kyrö’s (2008) framework for teaching and learning entrepreneurship, the conative outcomes are not explicit in the ECF itself, although Kraiger et al. (1993) and Fisher et al. (2008) emphasise the conative component within the affective outcomes construct. The ECF serves as the “gold standard” for writing learning outcomes in higher education, including EE. However, its functional interpretation has somewhat narrowed down the breadth and depth of the learning outcomes that the sources originating the framework prescribed as necessary to evaluate. Presumably, this has happened due to simplification of the assessment of the learning outcomes in a study process.

The concept of “competences” itself has been surrounded by scholarly debate and ambiguity because it crosses several disciplines (education, psychology, organisational behaviour) and there are many views on its components (e.g. learning outcomes, abilities, capabilities, personal traits). At some point, competences were understood as an underlying individual characteristic (like trait or skill) resulting in superior performance at work (Lans et al. 2008). McClelland’s (1987) views were based on this personal competency approach assuming a single

type of good practitioner (“entrepreneur-hero”). Bird and Schjoedt (2009) define competences as a mixture of abilities, knowledge, skills, traits, and concepts of self such as self-efficacy beliefs, whereas ability is a relatively stable broad characteristic of individuals that underlies maximum performance; skills are abilities to perform specific tasks that can be broadly or narrowly constructed (general or specific); knowledge is information an individual has in specific areas (explicit, tacit, general or specific). What many authors agree about is that competences are more than only skills, only behaviour or only knowledge, i.e. it is an integration of *learnable* components required for effective performance in certain contexts (Lans et al. 2008). Man et al. (2002:133) suggest that “*mere possession of competences does not necessarily make an entrepreneur competent*”, but one’s behaviour and actions can be demonstrated only through competences (see also Bird and Schjoedt 2009).

Fisher et al. (2008) brought the tripartite competence framework to EE in 2000s, by eliciting and categorising the learning outcomes specific to entrepreneurship. The study drew upon over 25 prominent experts in entrepreneurship research to categorise the relevant constituents of the three types of outcomes in business-specific (related to business concepts and actions) and interpersonal (social, psychological) contexts. The works of Brush et al. (2003), Baron (2000), Rae (2000), Jack and Anderson (1999), Garavan and O’Cinneide (1994a, 1994b), Gibb (1993), and others informed the categorisation. As a result, the basics of accounting, technology, marketing, knowledge of personal fit with an entrepreneurship career, understanding risk and other items made up the cognitive outcomes. The construct stood for declarative knowledge about entrepreneurship meaning both factual information and understanding relevant topics and discipline-specific knowledge (Alexander et al. 1991). Recognising and acting upon business opportunities, business planning, obtaining financing, managing people, among others, comprised the skill-based outcomes. The construct represented procedural entrepreneurial knowledge, or entrepreneurship-related skills (Kyrö 2008; Alexander et al. 1991). Finally, entrepreneurial spirit (measuring participants’ entrepreneurial attitudes), entrepreneurial learning (measuring change in attitudes attributed to the entrepreneurial course) and self-esteem among other multi-item constructs represented the affective outcomes. See Table 7 for the full set of entrepreneurship-specific leaning outcomes elicited by Fisher et al. (2008). This categorisation provided well-grounded theoretical support for the application of the tripartite framework in EE, which was also subject to empirical testing. The entrepreneurial competences are closely related to managerial competences in this system (Boyatzis 1982, in Man et al. 2002).

Using post-test surveys of undergraduate entrepreneurship students (N=100), who created companies as part of their training programme (i.e. experiential EE setting), Fisher et al. (2008) revealed a highly significant positive correlation between the cognitive and skill-based learning composites ($r=0.73$, $p<0.01$), and between entrepreneurial spirit (associated with positive affect and excitement to start-up, take risks, be creative, etc.) and skill-based learning composites ($r=0.32$, $p<0.05$). Students' entrepreneurial learning was positively correlated with cognitive ($r=0.36$, $p<0.01$) and skill-based ($r=0.51$, $p<0.01$) learning. Yet, entrepreneurial spirit was insignificantly related to the cognitive learning composites.

Table 7. Fisher et al.'s (2008) theoretical categorisation of EE learning outcomes

	<i>Business-specific content</i>	<i>Interpersonal content</i>
Cognitive outcomes	Basics of accounting, finance, technology, marketing Knowledge of how to get things done without resources Understanding risk	Knowledge of personal fit with entrepreneurship career
Skill-based outcomes	Conducting market research, assessing the marketplace Marketing products and services Recognising and acting on business opportunities Creating a business plan, incl. financials Obtaining financing Developing a strategy Identifying strategic partners Risk management	Persuasion, getting people excited about your ideas Listening Setting priorities and focusing on goals Defining and communicating the vision Leadership, motivating others Active learning Dealing with customers Managing people Resolving conflict Adapting to new situations, coping with uncertainty
Affective outcomes	Entrepreneurial spirit Passion for entrepreneurship Self-efficacy for entrepreneurship Commitment to business venture	Self-confidence, self-esteem Need for achievement, motivation to excel

Taking into consideration cognitive and skill-based learning outcomes, the tripartite framework simultaneously allows for the inclusion of an array of affection- and conation-related measures, such as attitude towards entrepreneurship, perceived entrepreneurial self-efficacy, feasibility and desirability in the affective learning outcomes, thus capturing a wider scope of

outcomes than the entrepreneurial intentionality models alone. Therefore, “Isaac is kept alive” (Brännback et al. 2007). As Fisher et al. (2008:474) put it, the tripartite framework “*balances recognition of multiple types of learning with parsimony*”. Similar to the ECF, the practical adaptation of the framework to EE was slightly simplified in measuring knowledge and skills. Nevertheless, we take the study by Fisher et al. (2008) as the main reference point for replication and methodological advancement.

4.1.2 Human capital theory and competences

From the human capital theory perspective (Becker 1975; Smith 1776), EE intervention is a human capital investment in schooling, which may or may not lead to competence development. There are essentially two types of human capital: general and specific, the differential impact of which is often considered in the literature (e.g. Unger et al. 2011). Age, formal education and work experience are common measures of general human capital present in numerous studies as control variables (Martin et al. 2013; Unger et al. 2011). Specific human capital – related to the entrepreneurship context, such as various venture creation activities, prior start-up experience – is known to be a more proximate predictor of start-up progress and survival (Unger et al. 2011; Davidsson and Honig 2003; Bruderl et al. 1992). For instance, Davidsson and Honig (2003) found that formal education increased the chances of engaging in nascent entrepreneurial activities, but not in determining success in the exploitation process, while previous start-up experience and having taken business classes were predictors of the frequency of gestation activities over time. Unger et al. (2011) found a significantly stronger relationship between task-related human capital (e.g. start-up, industry and management experience, business education) and entrepreneurial performance (in terms of size, growth and profitability) than for general human capital (e.g. level and years of education, work experience).

The theory contends that the greater the human capital the better the performance at a particular task (Becker 1975). EE stakeholders including students and their parents collectively invest in entrepreneurship-related human capital growth with expectations of positive future returns. The entrepreneurial competences, or learning outcomes of EE, therefore, stand for the education-level outcomes of human capital investments, or entrepreneurship-related human capital assets (Martin et al. 2013). These assets can enable and increase the productivity of entrepreneurial behaviour, be it related to launching and managing new ventures or to working in existing organisations (e.g. Bruderl et al. 1992; Becker 1975). The relationship between the *outcomes* of human capital investments

(knowledge/skills, or assets) and performance is known to be stronger than just for human capital (Unger et al. 2011).

Analogous to the corridor principle explaining serial entrepreneurship (Ronstadt 1988), information exposure and practical experience opens up cognitive, conative and affective corridors that make it possible to see more and better opportunities, and a better preparedness to exploit these opportunities (Davidsson and Honig 2003; Kirzner 1997; Hilgard 1980). “*Relevant knowledge can lead to the creation of more potent cognitive maps of the opportunity space*” and to making sounder entrepreneurial decisions (Dimov 2010:1132), the acquisition of financial and physical resources, and the accumulation of new knowledge and skills (Unger et al. 2011; Wennekers and Thurik 1999). Therefore, entrepreneurship-related psychosocial assets allow some individuals to behave more effectively and efficiently in the market place than others (Hindle et al. 2009; Kirzner 1997).

Educational interventions in entrepreneurship strive to develop entrepreneurial competences in students (or at least should do so), which ultimately implies making the learning processes such as acquisition and transfer, assimilation and accommodation or social interaction leading to human capital effects mutually successful for educators and students (Unger et al. 2011; Vygotsky 1978; Piaget 1929). Acquisition aims to transform learning experiences into knowledge, skills and attitudes. Transfer is the application of competences acquired during the educational process in new ways, with new content or in new situations (Schunk 2012; Unger et al. 2011). This is central to our system of education (Schunk 2012). Assimilation, accommodation and social interaction have been discussed in Chapter 2. Similar processes occur among entrepreneurs: active transfer of prior experiences into current practices, active searches for learning opportunities, improving and reflecting upon experiences are some of the distinct behavioural patterns in entrepreneurial learning (Man 2006). Competences developed as a result of EE should lead to self-employment, employment generation, economic self-sufficiency, business survival or growth (Kirby 2004; Wennekers and Thurik 1999). Appealing to task-related competences in evaluating the outcomes of EE for that matter is more sensible and empirically justified than to general competences (Unger et al. 2011).

Where entrepreneurship-related human capital assets acquired as a result of EE interventions transfer into manifestations of entrepreneurship is the stage when the returns on investments are expected by EE stakeholders. How can we measure these returns and when is the transference deemed successful? What is “better performance” in the realm of EE outcomes? Previous literature has largely focused

on entrepreneurial behaviour embodied in establishing new private enterprises and their performance (e.g. first sales, reported profit). Although it is an indicative measure, limiting objective outcomes to new venture creation is ungrounded, unless we deal with a study programme targeted at venture creation (e.g. Master in Technology Entrepreneurship at the Chalmers University of Technology). Nowadays, individuals should be able to rely upon themselves, have a greater sense of enterprise and self-help, where an extra challenge for EE is to develop an entrepreneurial personality going beyond commercial drive and venture creation only (Hytti 2008; Fayolle and Klandt 2006; Kirby 2004). Numerous EE programmes either implicitly or explicitly aim to increase graduate employability or grow entrepreneurial employees and future corporate entrepreneurs in the domain of entrepreneurship (e.g. Bridge et al. 2010; Lee et al. 2010; Mwasalwiba 2010). This position accords well with the European socio-economic goals of EE programmes – to enhance the attractiveness of university graduates for employers, improve their role in society and the economy as well as to encourage innovative business start-ups (Gibcus et al. 2012).

4.2 Objective outcomes of entrepreneurship-related human capital investments

The critical overview in Chapter 3 revealed that the objective measures of EE outcomes traceable in the entrepreneurship domain are less frequently encountered in the literature than the subjective measures related to the domain of education. As follows from human capital theory, investments in entrepreneurship-related human capital development should also determine the formation of objective outcomes. Theoretically, pre-conditioned upon the related human capital assets, entrepreneurship-level outcomes of investments objectively differentiate the field from other disciplines in higher education. Similar to the work by Martin et al. (2013), this conceptual stance broadens the scope of outcomes pursued by Unger et al. (2011) following Becker (1975), who distinguished between “outcomes of human capital investments” (knowledge/skills only) and monetary “returns” (increase in earnings due to greater amount of schooling). The primary interest of “investors” in EE – policy makers, parents of applicants or the applicants themselves – typically rests with pay-offs, returns on their investment; in other words, the outcomes tightly linked to objective expressions of entrepreneurial behaviour in the professional life of university graduates. The top management of universities or business schools as well as educators are not less interested in these

outcomes, even if sometimes regarded as the macro-level effects of entrepreneurship training programmes (Braun 2011).

The present work sets forth a threefold division of the objective outcomes of EE for evaluation purposes: private early-stage entrepreneurial activity (EA), intrapreneurship and employability interchangeably highlighted in international policy documents (e.g. CBI 2012; EACEA 2012; QAA 2012; OECD 2009) and by several scholars (e.g. Martin et al. 2013; Urbano and Turro 2013; Bridge et al. 2010; Lee et al. 2010; Gibb 1996). Not only is the fact of creating a new private or corporate venture and becoming employed upon graduation considered, but also concurrent performance indicators (e.g. job satisfaction, promotion, income) to the extent that the research design allows. Translation of entrepreneurial competences developed in the domain of education into the domain of entrepreneurship can be considered successful when they result in the achievement of the objective outcomes. Private early-stage EA is the most obvious objective outcome often expected from entrepreneurship graduates, whilst intrapreneurship and employability undeservedly lack credit in the EE impact research though are highly relevant and universally applicable to all specialties.

4.2.1 Employability

Employability means being prepared to work for other people, which requires reliable knowledge, skills and attitudes to gain and maintain employment positions, “sell” oneself to employers and make progress over time (Bridge et al. 2010; Yorke 2006; Hillage and Pollard 1998; Gibb 1996). Yorke (2006:8) defines employability as “*skills, understandings and personal attributes that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy*”. Fugate and Kinicki (2008:503) also view it as a trait- or competence-based measure defined as “*a constellation of individual differences that predispose individuals to proactive adaptability specific to work and careers*”.

In the UK policy documents, the concept is positioned as one of the quality assurance hallmarks, to which an enterprise has a high degree of application (QAA 2012). Strong employability focus is one of the distinctive features of EE in the UK, where education in enterprise is said to boost employability apart from and in some cases instead of a more traditional venture creation focus (Moreland 2006). A similar perspective is declared in policy documents of other European countries (e.g. Finland, Estonia, Sweden, Denmark), according to which entrepreneurship should be taught at all levels of the education system, “from ABC to PhD”, and

become interdisciplinary so as to grow and develop entrepreneurial personalities with positive attitude towards self-employment/entrepreneurship in all fields (e.g. Riigi Teataja 2013; Chiu 2012; EACEA 2012; MECF 2009). Entering employment after graduation and growing within it will also remain the most likely scenario for EE disciples.

Although deliberate choice of paid employment over self-employment may be regarded incompatible with freedom-loving and autonomous individuals excited by the prospects of launching their own business ventures, there are numerous reasons why the pursuit of employment is even more sensible for a young graduate. It is a well-known fact that most start-ups (in general, around 90%) fail (Marmer et al. 2012). “Fail faster, succeed sooner”, the motto attributed to the founder of IDEO, David Kelly, accurate not only for innovation designers but also for nascent entrepreneurs is both a strong encouragement and consolation for exits through failure or uncompleted start-ups. In fact, “puff entrepreneurship” peculiar to 20–23 year-old youngsters is not a destructive phenomenon unless it is too costly. By today’s standards, EE should teach and let students experience failure to avoid the harsh lessons of real losses despite being the most memorable (Gibb 2002). Students should also “learn from the mistakes of others, as we cannot possibly live long enough to make them all ourselves” (quoting Sam Levenson). By far, for over 50% of people there is no better place to start “true learning” than an existing organisation: encircle yourself with competent colleagues, collect the necessary start-up capital, build up your own expertise in preparation for an independent journey; think slow, but more accurately, take only well-thought-out risks, build more fundable ventures (Kahneman 2011). Being employed in a small or medium enterprise is even more beneficial for that matter.

Previous research demonstrates that 60%–75% of acting entrepreneurs transited from employment, having gained substantial industry experience in the first place before setting up their own ventures (Teigland et al. 2011; Wadhwa et al. 2009). As it usually takes time to reach “the fruition stage”, whether and when competences acquired during EE materialise in classical entrepreneurship let alone pay-offs from these particular endeavours, young graduates may act entrepreneurially and reap benefits in the labour market. Entering into preferable employment in the world of business venturing, retaining a position, growing within and above, demands a solid stock of entrepreneurship-related human capital assets an individual must possess and apply in real-life settings (Gibb 2002; Becker 1975). Therefore, these assets are expected to find practical application in the professional life of university graduates. The ability to work in a team, a sense of initiative, original thought, self-discipline, self-awareness, opportunity awareness,

decision-making and other competences once expressed in the corporate context can be captured with the employability measure (Bell 2016; CBI 2012; Hillage and Pollard 1998).

In contrast to previous literature, this work argues that the mere possession of entrepreneurial competences does not make one employable. Measuring employability should come in conjunction with employment (i.e. job entry) and encompass several progression indicators. Otherwise, employability is a measure of particular competences that overlaps with the learning outcomes of EE (e.g. Fugate and Kinicki 2008; Yorke 2006) or is limited to measuring employment (e.g. De Cuyper and De Witte 2010). How quickly one can find a job upon graduation, whether she retains the job, is satisfied with it and gets promoted, climbs up the ladder into managerial positions, where more decision-making authority and control over the work processes can be exhibited, are among key specifications of graduate employability as Table 8 suggests (based on Gibcus et al. 2012; Braun 2011; Bridge et al. 2010; Moreland 2006). Some of the constituents are very close to the concept of psychological empowerment that refers to one's feeling of meaningfulness and autonomy at work, which are inherent to growth in one's employment (Spreitzer 1995). The advantages of post-graduation employment subsequently span corporate entrepreneurship. Getting through the routine and technical work provides more space for creative entrepreneurial endeavours.

4.2.2 Intrapreneurship

The concept of intrapreneurship was introduced by Pinchot in 1976 and characterises entrepreneurial employees who are able to identify and exploit lucrative opportunities within a company (OFEM 2008). "Corporate entrepreneurship", "entrepreneurship within existing organisations", "corporate venturing" and "intrapreneurship" refer to one and the same phenomenon concerning either top-down or bottom-up initiatives (Bosma et al. 2012). Its tangible form can be a spin-off, a company's new subsidiary or the launch of a new product or service line, technologies, administration techniques, strategies, competitive tactics – as a result of the implementation by an employee of an entrepreneurial initiative, which is usually innovation-based (OFEM 2008). The concept therefore has a historical lineage going back to Schumpeter (1934) and creative destruction leading to more effective and efficient production processes within existing organisations and the establishment of new ventures (Moreland 2006). Intrapreneurial activities are commonly associated with the generation of new revenues owing to the development of new markets, products and activities,

with the creation of new jobs, the reduction of costs and the improvement of practices and internal processes in an organisation as a whole (OFEM 2008).

Definitions of the concept range from more generic entrepreneurial behaviour and the orientation of an organisation to new business venturing within the organisation (Urbano and Turro 2013). In the context of EE outcomes, intrapreneurial activity is an individual-level phenomenon that stands for furthering the degree of the progression of an already entrepreneurial employee. Therefore, it is the new venture and product/service creation aspect that is of particular interest for evaluation purposes (even though this purposefully narrows the concept). If the employee can afford to occasionally be entrepreneurial, an intrapreneur is an entrepreneur within the organisation, who bears similar responsibilities and risks except that the risks are backed up by the parent company. She does not typically invest her own funds, which is a great hindrance for most aspiring entrepreneurs. Having the limited burden of personal financial risk, nascent intrapreneurs go through the same process of recognising and exploiting new opportunities.

In order to be involved in intrapreneurial activities, one should obviously have established enough authority and credibility in the face of the top management and/or owners beforehand. Schøtt (2011) points out a trend similar to private venture creation that middle-aged employees are more likely to become intrapreneurs. Therefore, when it comes to younger graduates and in the context of small economies, nascent intrapreneurial activity is more reasonable to measure. Compared to private venture creation, it is rarer in the global context. However, with such an investment as EE and given the bets made, graduates equipped with entrepreneurial competences should reveal their tendency to climb the professional ladder faster, come up with entrepreneurial ideas and implement them already in the early stages of their career path.

The Global Entrepreneurship Monitor (GEM) study adopts a similar definitional focus of intrapreneurship, tracking present and past involvement in the development of new activities for employers, such as launching new goods or services, setting up a new business unit, a new establishment or subsidiary (Bosma et al. 2012; Schøtt 2011). These activities are organised into an idea-phase and an implementation phase, where employees can take either leading or supporting roles. Idea development for a new activity includes active information search, brainstorming and submitting ideas to management. The preparation and implementation phases involve promoting an idea, business planning or modelling, marketing the new activity, and financial and human resource management (ibid 2011). Both phases require a reliable stock of entrepreneurship-related human

capital assets on the part of the employees concerned. Table 8 outlines the intrapreneurship specifications suggested for evaluation.

Table 8. Specifications of the objective outcomes of EE

Employability	<ul style="list-style-type: none"> Time span for finding a job The number of employment positions (job retention) Promotion to higher positions The number of managerial positions undertaken Share of content control at work Degree of influence in decision-making Participation in the initiation of new activities Job satisfaction New ideas in everyday work (creativity)
Intrapreneurship (nascent)	<ul style="list-style-type: none"> Venture creation within companies Product creation within companies Active participation in ideation Role in ideation: leading or supportive Active participation in implementation of ideas Role in implementation: leading or supportive
Private early-stage entrepreneurial activity	<ul style="list-style-type: none"> Nascent entrepreneurship New private enterprises established, other forms of self-employment The number of jobs created Innovations: improved processes, goods/services, forms of organisation, business structures or practices Growth aspirations Accounting profit Turnover

In spite of their relevance and importance, employability and intrapreneurship have not been consistently credited as measurable outcomes of EE programmes. Even if an independent journey is not the intended option, entrepreneurial employability progressing into intrapreneurship is a decent aim to pursue, holding the prospects of private business venturing in the future, should it be desirable and feasible (Bridge et al. 2010). EE is capable of and should cater for diverse career aims of tertiary-level students.

4.2.3 Private early-stage entrepreneurial activity

The creation of new private enterprises (either commercial or social) can be tracked at the phase of total early-stage EA and/or in a more long-term perspective of established enterprises, following the GEM terminology (Bosma et al. 2012). The

term “total early-stage EA” covers: a) nascent entrepreneurs, who are in advance of the start of a new enterprise and are taking active steps towards it; and b) (co-)owner-managers of new enterprises that are less than 3.5 years old. In the cases of study programmes or courses run in the “education for entrepreneurship” mode and in compliance with the competence teaching model, a new enterprise is an expected and rational outcome. Therefore, start-ups are often established as part of the curriculum. Within the age group of young university graduates, solo-efforts in private enterprise creation might prevail, especially as a potential outcome of the demand model. For that matter, the GEM term can be reasonably extended to incorporate self-employed professionals. As entrepreneurial activity can also take place in corporate settings, this outcome emphasises the private nature of classical entrepreneurship.

The early phase of entrepreneurial activity is crucial since most dynamism, future job creation and innovation are expected from this group (ibid 2012; Birch 1979). It is arguably even better applicable to recent graduates or disciples of EE. Tracking the owners and managers of established enterprises can yield information on long-term survival rates, changes in employment rates, growth or contraction in size, added value, productivity contribution, innovation and export performance, put simply, the variables directly related to economic growth and poverty reduction (Ahmad and Hoffman 2007). Yet, as time goes by, acting entrepreneurs build up human capital assets acquired as a result of EE with new experiences, knowledge and skills. Therefore, entrepreneurial success might be to a lesser extent attributable to the net contribution of EE in the long-term than in the short-term. With respect to new enterprises established by recent graduates from HEIs, it is still possible to consider the number of jobs created, accounting profit and turnover within the first couple of years of an enterprise’s existence. Furthermore, growth aspirations and forms of innovation introduced, if applicable, are measurable as well. The suggested specifications of private early-stage EA are shown in Table 8.

According to Martinez et al. (2010), both nascent and established entrepreneurs are more likely to receive training in starting new ventures (30%) than the rest of the working age population (20%). The difference is statistically significant suggesting that early-stage EA is associated with past training in starting a business (at least to some extent). Even though not all enterprises make it to the fruition stage, the likelihood of reaching this stage can be enhanced by opportunities to research, discuss, experiment, innovate, prototype and so on, by the means of targeted educational activities (Moreland 2006).

4.3 Teaching model

The third component of the integrative framework is the teaching model. The main purpose it serves is to provide a theoretically grounded way of classifying EE interventions. This entails overcoming the existing distance between outcome evaluation and the dimensional characteristics of EE design and delivery (Béchar and Grégoire 2007). The teaching model also allows entrepreneurship educators pre-configuring EE interventions based on their teaching aims to target the outcomes more precisely. Moreover, coherence between the dimensional characteristics within a particular model (e.g. Biggs 1999) can help explain why some educational efforts work and others do not.

Up until now, the notion of experiential EE has not been defined clearly enough despite being often used in the literature (e.g. Hägg and Kurczewska 2016). This might be due to the notion's seeming intuitiveness since the application of the experience-based pedagogy is straightforward and a solid underpinning of experiential EE (e.g. Hynes et al. 2011; Lee et al. 2010; Löbler 2006). On the other hand, a clear definitional demarcation between traditional and experiential EE is needed for comparative research into the outcomes of the two as well as for educational practice. Following the working definition proposed in Chapter 2, experiential interventions encompass those that fall within the demand and competence models or a hybrid of both. This standpoint takes us further towards the empirical exploration of curriculum, methodology, assessment, and other dimensions. Identifying the prevailing teaching model, and hence, the form of intervention, makes an informed comparison possible of the associated EE outcomes that is one of the major gaps in the literature this work seeks to address.

In addition, this integrative framework makes it possible to zoom specifically in on the details and interplay of the operational dimensions because they concern the everyday practice of entrepreneurship educators and manifest the ontological dimensions (Béchar and Grégoire 2005b). Every teaching model features generic curricular aims and a methodological focus articulating certain learning and objective outcomes more than the others. This, in turn, may help educators pre-configure their interventions in line with one of the models (including hybrids) and state the targets. For EE researchers, this is a valuable piece of information for assessing whether the intended outcomes were achieved and how aligned the dimensional characteristics are within the dominant teaching model. Connecting the teaching models framework with writing and evaluating the EE outcomes, therefore, enables more grounded targeting and further analysis.

If we take the supply model, it is directed towards the more solid development of the cognitive outcomes. The competence model puts a stronger emphasis on developing entrepreneurial “know-how”; that is, skill-based outcomes. The demand model has a more salient connection with developing affective outcomes in individuals. Stronger emphasis on a certain learning outcome does not exclude the other outcomes, as they are meant to be interconnected (Fisher et al. 2008). On the objective outcome side, the competence model is expected to ensure the translation of the developed entrepreneurial competences into private early-stage EA. The employability and intrapreneurship outcomes have a stronger connection with the supply and demand models, respectively. Again, this does not exclude the transition of the employment roles; for example, from private entrepreneur to intrapreneur. If one has experienced the demand teaching model, a private company may still be established as a result of EE; alternatively, disciples of the competence model might succeed as intrapreneurs or become more employable in general.

The analysis of the dimensional characteristics that leads to the identification of the dominant teaching model, hence, the prevailing form of intervention, also sheds light on different types of coherence or incoherence related to EE interventions. However, interpretations of coherence between the dimensional characteristics may differ. Biggs’s (1999) coherence relates to alignment between the curricular, methodology and evaluation dimensions. Following Béchard and Grégoire (2007), we can look at several layers of coherence among the internal operational dimensions, between the external and internal operational dimensions, and between the external dimensions affected by the institutional and education system level factors. Moreover, multi-level coherence (ibid 2007) does not restrict all the characteristics to be focused around one particular model; for example, an intervention that focuses on the development of academic expertise in entrepreneurship but involves solving real-life challenges can still be considered coherent in some educational contexts (ibid 2007). Nevertheless, either in the case of “constructive misalignment” (Scott et al. 2015) or “destructive alignment”, the factual outcomes of learners are the most revealing indicator of the effectiveness of the intervention. The ultimate idea of striving for a high level of coherence among the teaching model dimensions is to ensure EE is effective and delivers measurable results.

4.4 Towards the integrative framework

Numerous studies to date have tackled the evaluation of EE outcomes, but a systematic approach that integrates the diversity of dimensions predicating an

intervention – the triad of entrepreneurial competences and the threefold division of objective outcomes – is yet to emerge in this realm. The integrative framework for evaluating the outcomes of EE contributes to the literature in numerous ways. It establishes a closer connection between EE and the field of education in writing the learning outcomes, explicitly considers the characteristics of EE design and delivery in reading the outcomes, shifts away from subjective measures towards mixed measures, and examines the association between the learning and objective outcomes of EE. The three main components of this framework follow one another in a way any EE intervention presumes. A teaching model represents human capital investment that influences the formation of individual-level competences in the education domain. These competences, in turn, shape the entrepreneurial behaviour of graduates in their professional life.

In practice, learning experiences may or may not lead to developed competences; that is, to growth in entrepreneurship-related human capital assets, and hence, to the objective outcomes associated with the educational intervention (Unger et al. 2011). For this reason an immediate relation of a teaching model to both types of EE outcomes is examined in this study. Human capital theory does not explain how the human capital transfer occurs. Yet, bringing a teaching model into the framework can be a valuable addition to EE impact studies that tend to overlook the reasons behind achieving positive results as often as they tend to report them (Lange et al. 2011; Sanchez 2011; Kolvereid and Moen 1997, etc.). This can also help in tackling the common criticism of the vague statements of the outcomes in EE practice, and in harmonising what is being targeted with what is being evaluated.

Individual or meta-analytical studies examining both learning and objective outcomes are rare (e.g. Martin et al. 2013; Lange et al. 2011; Kolvereid and Moen 1997) and do not shed light on quantifiable connections between the two types of outcomes. Learning outcomes in EE remain largely detached from objective outcomes. The links are particularly questionable in the logical chain of EE intervention resulting in the development or increase of entrepreneurial competences, which, in their turn, are supposed to lead to objective outcomes (Unger et al. 2011; Becker 1975). Indicatively, the studies reporting the positive impact of EE do not pay sufficient attention to the relationship between the two types of outcomes. The intentions-nascency/start-up link is already a rather crowded topic in EE research.

The empirical studies of EE on learning outcomes generally lack theoretical support from the field of education. The integrative framework suggests a theoretically grounded approach that originates from Bloom's taxonomy of

educational objectives (Kraiger et al. 1993; Bloom et al. 1964). Not only does it provide a holistic approach to writing the learning outcomes, but it also links to current policy discourse on entrepreneurial competences (Heder et al. 2011). The empirical studies of EE based on objective outcomes tend to overlook such crucial outcomes pertaining to the professional life of graduates as employability and intrapreneurship. Despite an increasing interest among educators and policy makers in the impact of EE beyond traditional venture creation (QAA 2012; Moreland 2006; Gibb 1996), the relationship between the learning outcomes of EE and the employability or intrapreneurship of university graduates remains unexplored.

In addressing the identified gaps in the EE literature, the hypotheses of this study firstly concern learning outcomes and their association with teaching models; secondly, the relationship between learning and objective outcomes as well as the association of the latter with teaching models. The two principal lines of falsifiable propositions the study targets are as follows: a) experiential EE is associated with higher levels of learning and objective outcomes of graduates than traditional EE; and b) the objective outcomes of EE are positively dependent on learning outcomes. Figure 3 visualises the integrative framework and hypotheses.

To what extent does EE enable graduates with the competences required in working life, and does experiential EE ensure fruitful learning relevant for one's professional life? The application of the integrative framework is directed at answering this multi-layered question.

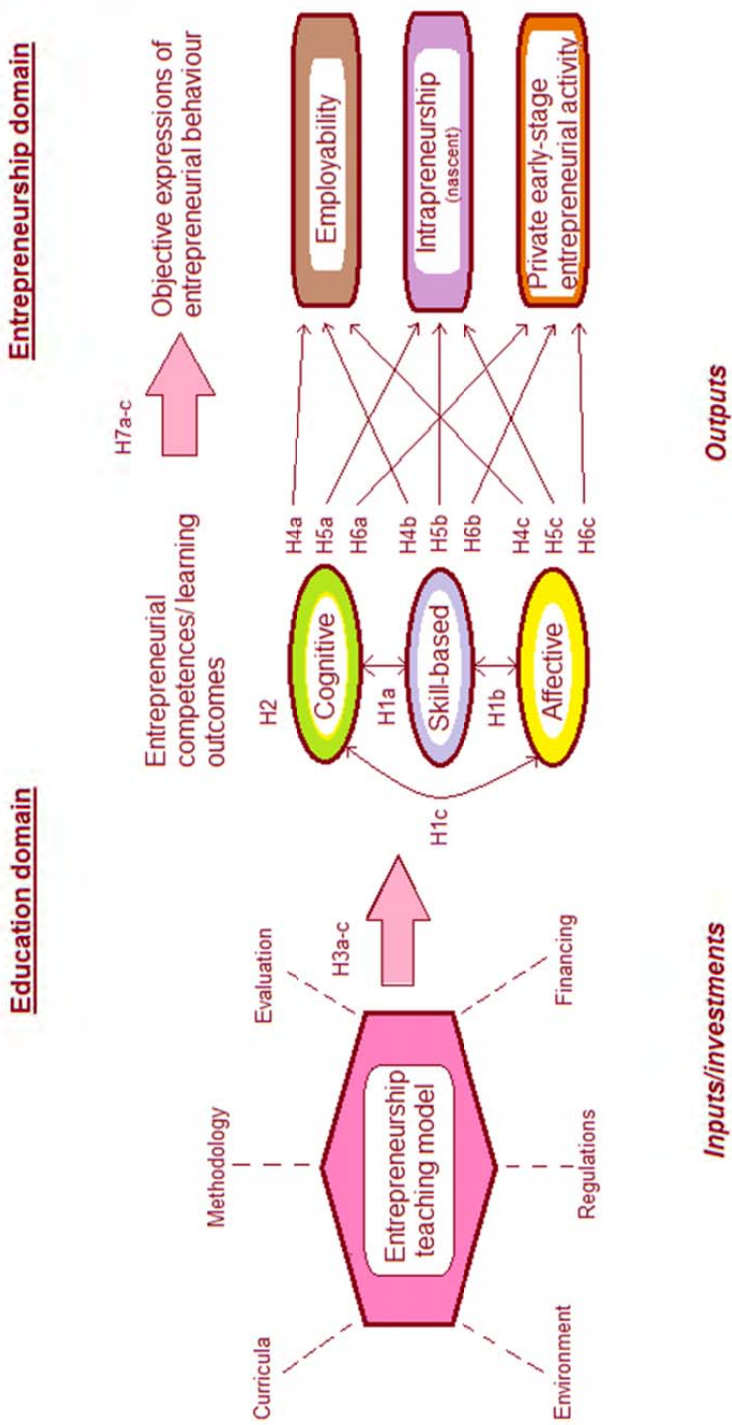


Figure 3. The integrative framework for evaluating the outcomes of EE and the study hypotheses

4.4.1 Study hypotheses

Education domain

Bloom's original taxonomy conjectures that the learning outcomes are made up of the hierarchically arranged constituents. Serving as a universal scheme of selecting, organising and evaluating any kind of instructional activities, it recommends enacting holistic learning that involves the development of cognitive, skill-based and affective competences one by one as well as simultaneously (Alexander et al. 1991). However, the logic of the relationships between the types of learning outcomes have not been granted sufficient empirical attention in EE research. To the best of the author's knowledge, only Fisher et al. (2008) have come up with evidence on correlational relationships between cognitive, skill-based and some affective learning outcomes. This finding supports the contentions of Allport (1935; in Brännback et al. 2007) and Alexander et al. (1991). However, Fisher et al. (2008) tested the relationships on a relatively small sample and found no correlation between entrepreneurial spirit and cognitive outcomes. In replicating part of this analysis, it is expected that the learning outcomes are positively inter-correlated:

H1a: There is a positive correlational relationship between cognitive and skill-based outcomes.

H1b: There is a positive correlational relationship between skill-based and affective outcomes.

H1c: There is a positive correlational relationship between affective and cognitive outcomes.

Next, EE research has not yet empirically addressed the order of the evolution of cognitive, skill-based and affective learning outcomes, whilst understanding this could help in designing EE courses and prioritise the development of particular competences. In the education literature, learning processes within the cognitive, skill-based and affective domains are assumed to be hierarchical (Bloom et al. 1956; 1964). Bloom et al. (1956), Kraiger et al. (1993) and Fisher et al. (2008) start their classifications with cognitive learning, which makes good sense in the formal education domain. Whatever the study discipline is, one commences with the acquisition of the basic knowledge about the subject matter. In the original taxonomy, affective learning comes next, while Kraiger et al.'s and Fisher et al.'s adaptations set skill-based learning instead. There is no explicit discussion about the prioritisation in these works, but a simple contention is that affective components which precede the target behaviour are more stable when an individual possesses the necessary knowledge in a certain discipline and knows she is able to

perform the discipline-specific tasks (i.e. possesses the required skills). The original logic would mean the formation of the basic knowledge at first, then the affective components, which should ultimately trigger the development of skill-based outcomes. However, affective outcomes can also decrease as a result, as is known to be the case with entrepreneurial self-efficacy and intentions (e.g. Graevenitz et al. 2010; Oosterbeek et al. 2010). To a greater extent, this might be attributable to failures in skill-based learning: “I wanted to perform and I was sure I could, but I failed de facto, so I do not want to perform any more” (Vermunt and Verloop 1999). Therefore, skill-based outcomes are hypothesized to act as a mediator between cognitive and affective outcomes:

H2: The relationship between cognitive and affective outcomes is mediated by skill-based outcomes.

Morshead (1968) notices a contradiction in Bloom et al.’s (1964) discussion of cognitive and affective domains. On the one hand, there should be a fundamental cognitive-affective unity, where cognitive learning is involved in affective learning. On the other hand, the authors assert that cognitive and affective learning must be teased apart for evaluation purposes. There seem to be no unity of scholarly opinions on the prioritisation of the evolution of outcomes. Kyrö (2008) suggests that affective learning is the most solid basis for further learning and behavioural developments. Fisher et al. (2008), in turn, posit that the tripartite “*framework’s explicit recognition of cognitive learning may provide a necessary counterweight to the emphasis on skill-based learning of entrepreneurs*” (p.319). Examination of the indirect relationship between cognitive and affective outcomes will help shed empirical light on the aforementioned prioritisation as assumed following Kraiger et al. (1993) and Fisher et al. (2008).

Human capital investments do not guarantee the acquisition or growth of human capital assets. At this stage, success in learning is believed to depend on the learning environment or context and the person (Quiñones et al. 1995, in Unger et al. 2011). Individuals of different innate abilities may extract different assets from similar investments (Martin et al. 2013). As long as we cannot control for genetic predictors in the frames of this study, it is the concept of teaching model that makes it possible to conclude about the kind of learning environment and identify which form of intervention is associated with superior educational outcomes. While entrepreneurial competences of varying depth and breadth can be developed, according to the teaching model, aims, focus, methods and means used, the resulting level of competences is expected to differ. Graduates who had more opportunities to act and reflect upon entrepreneurial learning process should be more knowledgeable about it and have higher level of skills than their counterparts

from more traditional classes. By the same token, failing in safe environment and learning from failure inherent in experiential EE, should result in higher level of affective outcomes. Consistent with the dominant rhetoric and conceptual discussions elaborated upon in Chapter 2, it is asserted that experiential EE (demand, demand-competence and competence teaching models) brings about higher levels of learning outcomes:

H3a: Experiential EE is associated with higher cognitive outcomes than traditional EE.

H3b: Experiential EE is associated with higher skill-based outcomes than traditional EE.

H3c: Experiential EE is associated with higher affective outcomes than traditional EE.

Entrepreneurship domain

The human capital perspective has been used to predict a variety of entrepreneurship outcomes such as becoming a nascent entrepreneur or self-employed, new venture formation, and its performance and survival (Dimov 2010; Davidsson and Honig 2003). Drawing upon this premise, educational outcomes of entrepreneurship-related human capital investments can also potentially be used to predict employability and intrapreneurship outcomes (Unger et al. 2011; Davidsson and Honig 2003; Becker 1975). Expanding the well-researched entrepreneurial intention-start-up behaviour link, this set of hypotheses concerns the associations between the triad of individual-level competences acquired through EE and the triumvirate of the objective outcomes traceable in the entrepreneurship domain. The application of human capital theory (ibid 1975) to the evaluation of EE outcomes makes it possible to go above and beyond entrepreneurial intentionality (e.g. Iakovleva et al. 2011; Krueger et al. 2000) and capture important linkages between the education and entrepreneurship domains.

Entrepreneurially competent candidates should gain fair advantage over potential competitors when both entering the labour market and operating within. Being knowledgeable about the entrepreneurial process is expected to help graduates better understand the owners or managers of organisations they work for, and how the companies function economically and socially. Entrepreneurial skill sets and attitudes to work can advance and speed-up progression within existing organisations. Schøtt (2011) suggests that highly educated individuals are more often involved in leading entrepreneurial work than their less educated counterparts. Their mean income also tends to be higher, even more than that of independent entrepreneurs. Entrepreneurial employees can also be distinguished

from routine employees, the former having higher job satisfaction, autonomy and meaningfulness than the latter (ibid 2011). Beyond factual employment entry (De Cuyper and De Witte 2010) and the dispositional characteristics of an individual (Fugate and Kinicki 2008), employability should capture the transference of entrepreneurial competences accumulated throughout EE in the domain of entrepreneurship. We can, therefore, assert that entrepreneurially competent individuals will achieve higher levels of employability and the latter is positively dependent upon the learning outcomes of EE:

H4a: Graduate employability is positively dependent on cognitive outcomes.

H4b: Graduate employability is positively dependent on skill-based outcomes.

H4c: Graduate employability is positively dependent on affective outcomes.

One recent study on factors conditioning intrapreneurship reveals that knowledge, personal networks and ability to identify business opportunities play a significant role in positively affecting intrapreneurial activity (Urbano and Turro 2013). Similar to employability, intrapreneurship is an objective expression of entrepreneurial behaviour in corporate context thus capturing the transference effect of the learning outcomes into action (Unger et al. 2011). Relative to the previous academic works on the phenomenon (ibid 2013) and GEM studies (Bosma et al. 2012; Schøtt 2011), the research into intrapreneurship as an outcome of EE is as novel as the research into employability. Likewise, the underlying presumption is that entrepreneurially competent individuals will engage in intrapreneurship more often at the early stages of a career path, regardless of the age factor (ibid 2011) and owing to the entrepreneurship-related human capital assets obtained as a result of EE. Because the current research deals with university graduates, it focuses on the nascent intrapreneurial activity that is hypothesized to be positively dependent on the learning outcomes of EE:

H5a: Nascent intrapreneurial activity of graduates is positively dependent on cognitive outcomes.

H5b: Nascent intrapreneurial activity of graduates is positively dependent on skill-based outcomes.

H5c: Nascent intrapreneurial activity of graduates is positively dependent on affective outcomes.

Extending previous research on engagement in start-up activities (e.g. Lange et al. 2011; Kolvereid and Moen 1997), private early-stage EA includes self-employed professionals, nascent entrepreneurs and new enterprise owners. The associations in this case address the previously untapped linkages in EE impact research, between the three types of learning outcomes with private entrepreneurial

action. Cognitive, skill-based and affective outcomes of EE are hypothesized to act as positive determinants of engagement in private early-stage EA:

H6a: Cognitive outcomes increase the propensity of graduates to engage in private early-stage EA.

H6b: Skill-based outcomes increase the propensity of graduates to engage in private early-stage EA.

H6c: Affective outcomes increase the propensity of graduates to engage in private early-stage EA.

Unger et al. (2011) argue that acquisition and transfer processes are central to human capital effects. Acquisition aims to transform learning experiences into knowledge, but obviously there is no guarantee that the experience leads to improved competences (ibid 2011). Transfer, in turn, is the application of knowledge acquired in one situation to another situation; this application can happen in new ways or with new content (Schunk 2012; Unger et al. 2011). We posit that transfer can occur even if a learning experience led to no changes or to an overall decrease in one's competences (e.g. the case of Oosterbeek et al. 2010). The similarity or familiarity with the situation is more important for successful transfer that might depend on deeply personal take-aways from the educational process (Thorndike 1906, in Unger et al. 2011). Reflecting on entrepreneurship as a career choice, students in experiential courses might have a better understanding of what is meant by entrepreneurship and make more conscious choices. Similar refers to other learning situations that model working life. Therefore, exposure to experiential EE as compared to traditional EE can be more important for objective outcomes over and above the effect EE makes on the learning outcomes of graduates. It is thus hypothesized that:

H7a: Experiential EE is associated with higher levels of graduate employability.

H7b: Experiential EE is associated with higher levels of nascent intrapreneurial activity among graduates.

H7c: Experiential EE is associated with a greater likelihood of graduate engagement in private early-stage entrepreneurial activity.

The integrative perspective on evaluating the outcomes of EE thus covers: a) the EE intervention dimensions, the interaction of which expresses a particular model of teaching entrepreneurship; b) the influential accumulation of related human capital assets from the teaching model, or formation of entrepreneurial competences; c) the accumulated assets determining subsequent individual behaviour/objective outcomes in the domain of entrepreneurship. The framework

establishes a closer connection between EE and education theory responding to Fayolle's (2013) call for a better integration of the two fields. It holistically incorporates the learning and objective outcomes overcoming the limitation of entrepreneurial intentionality models focused mainly on the affective and conative learning, and entrepreneurship outcomes of EE beyond nascency and private venture creation (e.g. Krueger et al. 2000). Referring back to the introductory chapter, the framework reflects the worlds of the entrepreneur (through human capital theory), cognition (through cognitive, skill-based and affective learning) and method (experiential EE). The world of process remains beyond the scope of this framework, as it is more concerned with entrepreneurial personality formation through exposure to different stages in the entrepreneurship process. There are some other delimitations worth outlining that, on balance, do not seem to overshadow the bulk of contributions the framework brings to the EE literature.

Entrepreneurial behaviour in the integrative framework is expressed through the total private early-stage EA (including self-employed professionals), intrapreneurship and employability, but does not include more generic entrepreneurial behaviour unrelated to existing organisations or new enterprises. This mainly concerns participation in voluntary or non-commercial work (e.g. charities or hobby clubs), while social entrepreneurship activities fall under either intrapreneurship or early-stage EA outcomes. In addition, family enterprise (co-) ownership, taking over an existing enterprise or inheritance of enterprise ownership is not segregated into separate sub-groups of private early-stage EA. The theoretical framework does not cover the dynamics of entrepreneurial learning – what happens in the learners' minds during the EE process. It does not take into account the innate abilities of subjects (in excess of what is known in quantitative genetics already) as well as their personality formation in the early stages of life. The general entrepreneurship ecosystem discussion is also too broad for this work. Yet, the EE ecosystem will be touched upon during the empirical qualitative part in more detail. Likewise, the influence of the labour market environment will be approached from the contextual angle in the following chapter.

The next chapter opens Part II of this thesis devoted to the research practice. The chapter sheds light on methodological details of the study: context, type of research design, sampling, measures, tools and methods of analysis employed.

PART II:
PRACTICE

5 METHODOLOGY

Evaluating EE outcomes proves to be a challenging undertaking even if we start with the premise that entrepreneurship can be experienced and at least some aspects of it can be learnt. There are many reasons for the on-going tensions and sources of bias, starting from the definitional debate feeding into teaching practices and the various objectives of educational interventions (e.g. personality development or moulding entrepreneurs) to the disparity among teaching objectives, methods and evaluation measures, the diversity of contexts and peculiarities of study designs (Blenker et al. 2014). Acknowledging the challenges and fair criticisms of previous studies comes with no delusions about the methodology in this research endeavour being ideal. Nevertheless, this study does intend to overcome some of the previous methodological limitations and contribute to bridging the identified gaps in compliance with the empirical and practical tasks of the monograph.

The most recent comprehensive literature review of methods used in EE research concluded that the apparent dominance of empirical material from Anglo-Saxon countries may have led to an “*unwarranted generalization of findings from these contexts*” (ibid 2014:706). Turning to countries with a different socio-cultural background and economic history may offer new insights or empirical patterns. The authors of the above review also urged the deployment of more refined forms of data analysis and research design to counterweight the strong reliance on descriptive analysis and the shortage of mixed methods studies. The author’s complete solidarity with these authors also rests with the suggestion to increase researcher sensitivity to differences in learning outcomes, teaching methods, institutional settings and student diversity.

In addressing these calls, the current research venture applies itself in the post-transition context – a socio-economic environment different from that in the studies explored in Chapter 3. It combines both qualitative and quantitative research strategies, a multiple embedded case study design, cross-sectional and comparative designs, as well as structural equation modelling during the data analysis stage. These methodological efforts undertaken to test the integrative framework for evaluating the outcomes of EE will provide discussion that spans several levels of analysis: regional (policy context, government initiatives), institutional (EE at

individual universities), course and teacher/student levels (how EE is delivered and what the outcomes are).

The following subsections of the chapter explain and justify the choice of the research strategy, types of design and sampling, operationalisation of variables, and methods and tools used for the data analysis. The empirical context of the EE implementation is two post-transition countries of the Central Baltic region – Estonia and Latvia – subject to the analysis presented here.

5.1 Context: Estonia and Latvia, post-transition countries

Estonia and Latvia are neighbouring countries located in the north-eastern part of Europe, on the shore of the Baltic Sea. Both countries joined the European Union in May 2004 and accessed the Eurozone in January 2011 and 2014, respectively (due to how quickly each overcame the consequences of the global financial crisis that hit in 2008). Unlike other member states in the Central Baltic region (Finland and Sweden), over a decade after regaining independence in the early 1990s, they transitioned from a planned to a market economy as a result of the collapse of the Soviet Union. The transition process included economic liberalisation, restructuring and privatisation, legal and institutional reforms as well as macroeconomic stabilisation (IMF 2000), during which the primary and industrial sectors of the economy contracted extensively (Huisman et al. 2007).

These planned economies had been dominated by large firms producing few consumer goods; SMEs, a large part of every market economy, were almost non-existent (McMillan and Woodruff 2003). The reforms led to economic freedoms and flexibility creating plenty of opportunities for start-ups. As the new socio-economic system was in the process of formation, the transition process also led to the expropriation of profits through corruption, envelope wages, tax evasion and other illegal activities because some governments made it hard for entrepreneurs to operate, while some entrepreneurs took advantage of the situation (ibid 2003). Needless to say, the first decade of transition was economically and socially turbulent leaving plenty of space for unproductive and destructive entrepreneurial activities (Baumol 1990). Even at present, the share of the shadow economy is relatively high, especially in Latvia, where it accounts for 23.5% of GDP in comparison to 13.2% in Estonia (although it fell from 36.6% and 20.2% in 2009) (Sauka and Putnins 2014).

As of now, Estonia and Latvia are both classified as innovation-driven countries according to the classification for economic development levels in the World

Economic Forum Global Competitiveness Index. However, GDP per capita remains among the lowest in the EU – the International Monetary Fund data showed in 2014 that the countries were ranked 24th and 27th in Europe, respectively (IMF 2014). In spite of the Soviet legacy and a decade of turbulence that might have influenced attitudes towards entrepreneurship in society during the transition years, nowadays 55% of Latvians and 56% of Estonians view entrepreneurship as a good career choice (Krumina and Paalzow 2015). This figure is even higher than in some developed European regions with a capitalist legacy including Belgium, Germany, Luxembourg and Finland. The rate of perceived opportunities to start a new business is 49% in Estonia (one of the highest in Europe) and 26% in Latvia, and the rate of perceived skills and knowledge for starting up is somewhat adequately balanced in Estonia (40%), while being almost twice higher in Latvia (50%).

Total early-stage entrepreneurial activity in these countries (TEA, including nascent entrepreneurs and new businesses less than 3.5 years old) was the highest in Europe in 2013 – 13% in both countries, well above the EU-average of 8%, and similar to entrepreneurial intentions (13.5%) at 19% of Estonians and 23% of Latvians at the time (Krumina and Paalzow 2014). Estonia also remained a European leader in terms of the number of start-ups per head of population with most of them mushrooming in the IT sector (WSJ 2012), whilst nascent enterprises in Latvia tended to be more focused on service industries (e.g. beauty salons, coffee shops). In the following year, TEA fell to 9% in Estonia and 12% in Latvia, currently the highest in Europe according to Krumina and Paalzow (2015). For comparison, in Finland and Sweden the TEA rates are at 6% and 7%, respectively. At present, Estonia and Latvia are also positioned among the first 25 countries in the global entrepreneurship development index (Acs et al. 2016).

The share of young people aged from 18 to 35 in TEA accounts for almost 40% in Latvia and 30% in Estonia; half falls on 18–25 year-old individuals in Latvia and 10% in Estonia (ibid 2015). In terms of established businesses (3.5 years and older), Latvia leads with 9% compared to 6% in Estonia, but also in discontinuation rates – 3% versus 2%. Over the years since the global financial crisis, opportunity-driven entrepreneurship has significantly prevailed over necessity-driven in both countries (ibid 2015), but almost 40% of opportunity-driven entrepreneurs mention increase of income as one of the key reasons for engaging in entrepreneurial activity (Arro et al. 2012). Most of the nascent and new enterprises are moderately ambitious in terms of expected job creation: 40% and 60% of Latvian and Estonian entrepreneurs plan to create no more than five new jobs.

Martinez et al. (2010) and Arro et al. (2012) suggest that 28% and 33% of the working age population in Latvia and Estonia were trained in starting a business, slightly over one-third of those received this training as part of formal education. Forty-two per cent (42%) of nascent and new entrepreneurs in Latvia experienced educational interventions in entrepreneurship, while the comparable figure in Estonia was 35%. Therefore, the ratio of trained entrepreneurs to trained individuals was 1.5 in Latvia and 1.1 in Estonia; that is, entrepreneurs are more likely to have received training in entrepreneurship, especially among Latvians, where the difference is statistically significant. Assessing these and the TEA figures, one could assert that entrepreneurial activity in its classical meaning is associated, at least to some extent, with EE in these post-transition countries, which makes the chosen empirical setting even more topical to research (Martinez et al. 2010). Sadly, there are not sufficient publicly available data to compare the state of the corporate venturing and general entrepreneurial behaviour of Estonians and Latvians, except for the fact that 2.2% of the adult population and 3.6% of employees in Latvia were involved in intrapreneurial activities in 2011 (Bosma et al. 2012). This is a comparatively low activity if benchmarked against Finland (8.0% and 11.4%) or Sweden (13.5% and 18.4%), where there are effectively more large companies than in Latvia.

The Global Entrepreneurship Monitor, the world's foremost study of entrepreneurship, treats EE as one of the entrepreneurship framework conditions in every country, the other being availability of financing, government programmes, national policy and regulation, and commercial and physical infrastructure, among others (e.g. Singer et al. 2015). Rated on a 1–5 scale, EE at the post-secondary level scored 3.17 in Latvia and 2.99 in Estonia exceeding the EU-average of 2.82 in 2014. The indicator shows the extent to which EE encourages creativity, self-sufficiency, a sense of initiative, provides essential knowledge about market principles, and “*pays adequate attention to entrepreneurship and new firm creation*” (ibid 2015:57). In most other framework conditions, Estonia scored slightly higher, except for public policy support for entrepreneurship (including taxes or regulations that are either size-neutral or encourage new companies and SMEs) (2.60 versus 2.43) and commercial and legal infrastructure (3.74 versus 3.21).

The questions of financing, government support, policy measures, and ecosystem development are not less topical for EE, as has been highlighted in Chapter 2. Formal EE in Latvia does not receive special financial support from the government at the moment; consequently, it remains an initiative developed solely at the level of HEIs and educators, often financed by European programmes

(Kozlinska et al. 2013). EE has not been a priority of the state education policy even after joining the EU (McCoshan et al. 2010). However, some progress has been made through the inclusion of *entrepreneurship-related* topics and courses at all levels of the education system since 2007 (e.g. business basics, project management, and setting up a new enterprise) (Bikse 2009). Estonia, on the contrary, has been purposefully developing formal EE for almost five years (EACEA 2012). One of the most recent distinctive legislative changes accepted by the Ministry of Education and Science is the integration of *entrepreneurship* as a compulsory subject into curricula for all disciplines at the higher education level (e.g. Riigi Teataja 2013). These kinds of progressive state initiatives in Estonia are often explained in terms of its geographic proximity to Finland. For that matter, education in state HEIs in Estonia has also been made tuition-free, unlike in Latvia.

That said, the recent analysis of educators' practices in the Central Baltic region shows that in Latvia and Estonia, EE tends to be equally practice-oriented and employs action-based learning methods even in the absence of a well-developed ecosystem that includes the relevant infrastructure (e.g. prototyping and design factories, incubators, university-industry cooperation platforms, etc.) (Kozlinska et al. 2013). Hence, further questions for discussion include: Does policy support matter in generating outcomes? What role does the EE ecosystem play in the educational process? In the nearest future, the on-going shift towards experiential EE might become even more pronounced and secure support at the policy level also in Latvia.

In Estonia, the recent performance agreement between the Ministry of Education and Research and local universities stipulates the universities have to develop transferrable enterprising skills and attitudes, enterprise and innovation awareness in students by complementing the integration of entrepreneurship courses with the use of participatory teaching methods, including internships and the involvement of practitioners in the study process (Riigi Teataja 2013). At the time of the survey (i.e. 2013), it was still possible to capture predominantly traditional interventions in Estonia and Latvia, which is very valuable for this research setting and analysis. One year later, in the 2014/2015 academic year, the situation changed in a number of institutions associated with more traditional EE in the past.

Finally, the local labour market environment is pertinent to the contextual discussion. Average monthly gross wages in Estonia amounted to EUR 1005 in 2014, while the unemployment rate was 8.7% (Statistics Estonia 2015). The same indicators in Latvia were EUR 765 and 10.5% (Central Statistical Bureau of Latvia 2015). Simultaneously, the income earned from entrepreneurship was in the higher-

than-average division with no significant differences between various stages of entrepreneurial activity in both countries (despite the fact it often does not generate immediate income at the early stage). In Estonia, approximately 60% of entrepreneurs belong to the upper 33% of household income distribution compared to 30% non-entrepreneurs (Arro et al. 2012). Likewise, in Latvia, about half of the early-stage entrepreneurs and 40% of established entrepreneurs belong to the upper 33% of household income distribution (Krumina and Paalzow 2014). Therefore, it is possible entrepreneurial activity is more attractive for Latvians and Estonians than standard employment in monetary terms. In more prosperous European countries, such as Sweden and Finland, the comparatively high wages and security level might make employment more favourable to entrepreneurial activity. Other labour market conditions in Latvia and Estonia could affect the more frequent selection into classical entrepreneurial activity.

The labour market in Latvia still features several imbalances. Research by Sloka et al. (2007) showed that there is a mismatch between employer demand for educated employees and the output of professional and higher education programmes. The employers see work motivation, communication and specialist skills as particularly lacking among job applicants. Around half of the employees do not work in professions that correspond to their educational background (Dubra et al. 2007). Data from the Employers' Survey indicate disproportionate labour market development (e.g. a large number of employees occupying several jobs simultaneously, but overall labour force insufficiency), violations of labour legislation regarding occupational health and safety (e.g. high demands of employers requiring long hours of work, over 40 per week) and labour market relations in work places (e.g. envelope wages), high labour force migration that distorts the market, also creating high risk professions and sectors (e.g. security, construction, forestry) (Vanadzins et al. 2013; Dubra et al. 2007).

The current state of the Estonian labour market has been largely impacted by the Employment Contract Act adopted during the economic recession in December 2008 (in force from July 2009) (Masso et al. 2013). The measures included a reduction in nominal wages and working hours, making the termination of employment relations less expensive for employers (Eamets 2013). The measures also implied less freedom and bargaining power for employees. At present, for 57%–63% of employees, employers unilaterally determine all terms and conditions of employment contracts (Masso et al. 2013). Possibly, for that reason, employees and unemployed people (around 30%) often have problems in employment relations with contracts tending to deviate from the minimum conditions provided for in the act. Up to a quarter of Estonian companies still do not agree on wage cuts

with their employees, even though the law requires them to do so (ibid 2014). On the other hand, the regulation of the working time also meant the protection of employee health. The average length of a working week is about 38 hours in Estonia at present (ibid 2014). The proportion of employees working longer hours and overtime work is registered at negligible levels – 2% and 3%.

Similar to Latvia, there is a strong and consistent demand for skilled labour, but concerns regarding skill and labour shortages (Huisman et al. 2007). A significant proportion of graduates appear not able to find employment in an area matching the competences they acquired in higher education. To counteract the detachment of higher education from the labour market, there are several efforts already in force regulated by the Estonian Higher Education Strategy 2006–2015. These efforts include: diversification of the supply of higher education programmes through the expansion of professionally and vocationally-oriented sectors; influencing the choice of students according to assessments of labour market needs; establishing greater partnership between HEIs and employers (e.g. presence of employers on advisory bodies at HEIs, their participation in curriculum development) (ibid 2007). However, input by employers to higher education policy appears to be somewhat limited, and it is not yet clear whether the current offerings manage to respond to actual labour market needs (ibid 2007).

As has been fairly pointed out by Brännback et al. (2007), contextualisation itself often diverges from generalisability. Yet, contextual results can still be generalisable to the countries researched. This study looks at two small neighbouring open economies with a relatively flexible labour markets that share a similar history and post-Soviet legacy, but are slightly different in terms of their pace of economic development. The discussion on the implementation of EE in Latvia and Estonia is taken deeper through the system of dimensions presented in Chapter 2, and the outcomes of EE are evaluated relying on the integrative framework outlined in Chapter 4.

5.2 Quantitative and qualitative study projects

The empirical research process consisted of two logically connected stages. As part of the qualitative stage, face-to-face individual semi-structured interviews were conducted with entrepreneurship educators teaching the discipline at Latvian and Estonian HEIs. As part of the quantitative stage, an online post-intervention survey was administered to final year bachelor students and recent graduates (from the same programmes), who were taught by the educators interviewed. The task of the

first stage was to gain maximum insights into the teaching dimensions and to diagnose the prevailing model pursued by the educators, thereby classifying respective interventions as traditional or experiential. In the second stage, the data were collected to estimate the learning and objective outcomes of the respondents across the selected HEIs. In order to cross-check and complement the information obtained during the interviews, the survey also covered EE intervention details specifically pertaining to teaching methods, or the activities the respondents were involved in during the study process. Therefore, in general terms the study adopts a mixed methods design with the following sub-types: embedded design and methods triangulation (Creswell 2012; Greene et al. 1989, in Blenker et al. 2014). See Table 9 below for a brief overview of the key methodological aspects outlined further in more detail. Pursuit of a mixed research design involves exercising two research strategies featuring different epistemological and ontological orientations (positivism and objectivism versus interpretivism and constructionism), but in a complementary and mutually enriching fashion (Bryman and Bell 2007).

5.2.1 Types of research design

The mixed methods embedded research design refers to a situation when one type of data plays a supportive role to the other (Creswell 2012). Collected simultaneously or sequentially, they are both part of a single study. The generated datasets (interviews and surveys) are analysed separately and address different research questions (ibid 2012). In this case, the qualitative interviews (the supportive form of data collection) supplement the subsequent survey (the major form). The survey data is used to test the hypotheses. Gaining qualitative insights into the delivery of EE in the selected HEIs provides a deep understanding of the survey context and ensures the quantitative results are interpreted in a scientifically justified manner (Bryman and Bell 2007).

Method triangulation means using different methods independently and simultaneously to study the same phenomenon so as to limit possible biases (Blenker et al. 2014). Cross-checking the educators' responses about the teaching methods they use as an indicative operational sub-dimension of the dominant model within the educators' control makes it possible to ensure that the subjects

Table 9. Methodological aspects of the study

<i>Empirical study projects (SPs)</i>	Types of research design		Sampling	Data collection	Methods of analysis	Tools of analysis
Qualitative SP - how is e-ship taught – analysis by dimensions (curriculum, methodology, regulations, etc.)?	Mixed methods approach: embedded design and methods triangulation	Multiple case study embedded design	Purposive expert sampling - entrepreneurship educators teaching at 16 local HEIs (2 per institution) - $N_{EST}=8$, $N_{LV}=8$	- face-to-face individual semi-structured interviews - personal networks - Entretien project	Content analysis through data coding	NVivo (QSR International)
Quantitative SP - what outcomes does EE bring about? - estimation of educational and objective outcomes		Cross-sectional with matched comparison groups/ comparative design	Purposive homogeneous sampling - last year bachelor students and recent graduates of the interviewed educators - $N_{EST}=218$, $N_{LV}=341$	- Qualtrics online survey - respondents taught by the educators	Structural equation modelling, composite indicator building, correlation analysis, mediation regression, ANCOVA Composite indicator building, stepwise and binary logistic regression estimations	AMOS SPSS

are not exaggerating their educational efforts when faced with an interviewer, and the responses of the parties are compatible.

In more specific terms, a multiple case study embedded research design is followed in the qualitative study project (Yin 1984). Multiple case studies are largely undertaken for the purpose of comparing the findings deriving from each of the cases included in the analysis, to understand the similarities and differences between the cases (Baxter and Jack 2008; Bryman and Bell 2007). An entrepreneurship educator acts as a unit of analysis within one case (i.e. an HEI). Two educators were interviewed per HEI; therefore, one case involved more than one unit of analysis and the units were embedded in each case. The main focus here is on the individual cases and their uniqueness rather than on the sample of cases (ibid 2007).

In the quantitative study, cross-sectional and comparative designs are pursued. These two types are essentially very close to each other. The former entails data collection on more than one case at a single point in time to gather a body of quantifiable data in connection with two or more variables (ibid 2007). The latter implies there are at least two cases and the data are collected in a cross-sectional format at more or less the same point in time for the sake of comparison (ibid 2007). In compliance with the research tasks, and following the identification of the prevailing model of teaching entrepreneurship at each HEI, the EE outcomes of the survey respondents are estimated and compared. Respective inferences are drawn about potential connections between intervention type and the levels of outcomes (comparative aspect), and the relationship between types of outcomes (cross-sectional aspect). Since the respondents are aimed to be comparable in terms of several descriptive characteristics such as age, gender, study background, level of education, and form of study, this naturally creates matched comparison groups. In principle, the approach could also be classified as a multiple case study design, where the units of analysis are groups of students and graduates from certain HEIs. Still, the emphasis in the quantitative study is on the sample of cases and producing general findings rather than on individual cases (ibid 2007).

Although a classical experiment with random assignment or a quasi-experiment is commonly preferable for measuring educational impact, it was not feasible to implement such approaches in view of the scope of the data collection, length of the questionnaire and project time frame. In that sense, the study methodology does not stand out in ascertaining the direction of causal influence, though the assumed causal links are based on the sound theoretical reasoning outlined in the previous chapter. Even though there is no time ordering of the variables, the cross-sectional design still makes it possible to uncover the relationship between them.

Furthermore, the content of the survey instrument compensated for the post-test measurement through the wording of some questions and the inclusion of a variety of control variables (in particular, those related to the prior knowledge and experience of the respondents). According to Creswell (2012), some cross-sectional designs are fine to use when evaluating educational programmes, if such a survey is informative enough to be useful for decision-makers.

An educational outcome is supposed to occur as a result of an intervention. Measured at the end or some time after the intervention, it reflects the influence of education in the short and mid-term provided a researcher controls for the prior level of the outcome measure. Measurement a long time after the intervention is not necessarily the best. To a large extent, it depends on what is measured and how. For instance, as far as declarative knowledge is concerned, as an immediate outcome of a course it can become dispersed or forgotten during working life unless applied on a regular basis. To gauge outcomes in the education domain, short-term measurement is more sensible. If a retrospective analysis is in place in the long-term, successes or failures in professional life can bias responses about the educational part. With regard to the entrepreneurship domain, the more time passes after the intervention, the harder it is to connect the learning outcomes with the objective ones. At the same time, short-term measurement alone may yield immature objective outcomes. In the current study, this issue is solved through a further sampling strategy.

Classical or quasi-experiments, which were not feasible to implement, are also known to have their drawbacks. Either teachers or students are often reluctant to take part in experiments unless well-endorsed. It would be very unlikely to reach a representative sample in the frames of this research project should one of these designs be adopted (Bryman and Bell 2007; Slavin 2002). In addition, given that capturing the “true impact” of an intervention is a complex task, even during experiments, participants experience educational activities differently. It still remains challenging to single out those who are generally unsuccessful in educational settings, but tend to do well in professional life regardless of educational attainment. The chosen types of research designs were, therefore, considered a realistic trade-off between depth, range of detail, and comparability of data, on the one hand, and availability of time and resources for the research project, on the other.

To assess the quality of the research, it is customary to discuss a range of interconnected criteria. Under the auspices of the known research designs, there are certain ways in which a researcher can prove compliance with the quality criteria. When it comes to quantitative research, reliability, replicability and validity

(internal, external, and construct) are the criteria in place (Bryman and Bell 2007). In qualitative research, the closest analogues are dependability, confirmability, transferability and credibility (Lincoln and Guba 1985, in Bryman and Bell 2007). Table 10 explains their essence and the means that can be used to justify the ability of the cross-sectional and multiple embedded case study designs to meet these criteria. The study attempts to deploy most of the means suggested albeit with a few limitations in meeting the external and internal validity criteria.

Dependability and reliability in both lines of research can have at least two different meanings. One of them, stability of findings over time, is evidently hard to prove within one quantitative study. For that reason, Cronbach's alpha, the indicator of the internal consistency of measures most commonly used by researchers, will be used. Dependability in the qualitative case study research will be achieved through peer audit; that is, the assessment of the author's inferences from the expert interviews by one senior researcher (ibid 1985). This researcher will also independently examine the interpretation of the findings (i.e. confirmability). Replicability can only be ensured by outlining the procedures for data collection and quantitative analysis in detail, which follows in the ensuing subsections (Baxter and Jack 2008; Bryman and Bell 2007). Pursuing identical data collection and analysis procedures in two countries in this study effectively supports replicability. Replication of the procedures does not necessarily guarantee replicability of findings especially if time lags between two measurements or subtle contextual differences are in place.

Validity presumes reliability; an unreliable measure cannot be valid by definition (Bryman and Bell 2007). Yet, one limitation typical for cross-sectional data relates to internal validity implying it is challenging to establish causality. A fair question which fellow researchers might ask is how we know that the educational and objective outcomes evaluated are truly a result of EE. One answer to this question consists of several points that support internal validity. Few of them will unfold in the analysis of results; that is, through a comparison of recent and imminent graduates, entrepreneurship and non-entrepreneurship graduates. Other points relate to the wording of questions in the survey instrument and controlling for the prior competences of the respondents. Last but certainly not least, other studies with similar logics and theory-driven expectations from EE are taken as examples (e.g. Piperopoulos and Dimov 2014; Charney and Libecap 2000; Lange et al. 2011; Kolvereid and Moen 1997). They are all based on relatively short EE courses (with the Berger programme being the longest, 3 semesters) and post-intervention measurements (i.e. cross-sectional designs with control groups). Thereby, the theoretical reasoning strengthens the study design.

Table 10. Main criteria for research quality per type of design employed in the study projects (SPs)

<i>Quality criterion for quantitative research</i>	SP 1. Multiple case study design	<i>Quality criterion for quantitative research</i>	SP 2. Cross-sectional design
Dependability	Stability of findings over time. Assessment of the degree inferences can be justified. → Auditing approach/peer audit.	Reliability	Consistency of measures (indicators making up the scale) devised for concepts. Stability over time (would the results from the same respondents fluctuate?) and internal reliability (inter-relatedness of the scale indicators). → Most common – Cronbach's alpha, exploratory factor analysis.
Confirmability	Objectivity of interpretation. Would other researchers interpret the findings similarly? → Peer examination.	Replicability	Spelling out all the measurement procedures in detail so that other researchers could replicate the study. → Likely to be present. Detailed outline of procedures.
Transferability	Applicability of the findings to other contexts/countries. → Can be either confirmed through replication or taken at face value in similar contexts.	External validity	Generalisability of results beyond the specific context. Representativeness of a sample. → Consistent selection procedures. Usually strong in case of random sampling; questionable in non-random samples.
Credibility	Acceptability to others. → Double coding. Respondent validation or triangulation.	Internal validity	Causality. Certainty in X causing Y. → There is no way of explicitly proving this with cross-sectional data except for theoretical support.
-		Measurement validity	Construct validity. Does a measure devised for a concept really reflect the concept? → Deduction of hypotheses and measures from theory or using existing scales. Average variance extracted in SEM.

Another limitation in the quantitative study project concerns external validity that comes as a consequence of non-probability sampling. At this point, however, it is too early to question the external validity, since the cross-sectional data is embedded in the analysed cases, and there are strategic reasons grounded in the details of sampling to support the generalisability of the findings to the country level as a minimum (Creswell 2003). Construct or measurement validity will be supported by deriving key measures from previous studies and refining some of them during the statistical analysis.

The final two criteria of validity in qualitative research, credibility and transferability, will be met by: double coding the data at two different time periods and making planned comparisons between Latvia and Estonia.

5.3 Sampling and data collection procedures

A set of researchers' decisions about the identification and selection of organisations, places or people for primary data collection is referred to as the sampling process. Sampling decisions often play an instrumental role in determining the research quality. In quantitative enquiries, the usual intent is to achieve a representative sample that enables generalising the results to a population. They habitually demand probability sampling strategies, such as simple random sampling, or systematic or stratified random sampling. Qualitative enquires are more concerned with an in-depth exploration of a studied phenomenon, for which non-probability sampling strategies based on a subjective judgement of a researcher are more suitable; for example, convenience, opportunistic or snowball sampling (Creswell 2012; Bryman and Bell 2007). Participants or organisations are selected because they are available, convenient or feature characteristics of interest to the researcher.

The sampling strategy has to be consistent with the study design. When it comes to mixed methods research, finding an appropriate strategy might be tricky, especially with diversification of sampling types, where the non-random types more often used in qualitative sampling become suitable for quantitative sampling (e.g. snowball and homogeneous sampling) and vice versa (e.g. maximal variation and theoretical sampling) (Creswell 2012; Patton 1990). In education research, probability sampling is not always possible to implement, but if a target population is relatively small, the findings can still be generalisable. Even if not, it is not considered a weakness, but a conscious choice flowing from the research design, the purpose of which varies depending on the type of non-probability sampling

used (Creswell 2012). This study follows a purposive sampling strategy and its sub-types. Expert and homogeneous sampling are employed, accordingly, at the qualitative and quantitative stages. An attempt is made to offset the judgemental component of purposive sampling using transparent reasoning upon which the sampling decisions are made and the data collected.

5.3.1 Purposive sampling

Purposive, or purposeful, sampling is a type of non-probability sampling where researchers intentionally select sites or individuals to study the phenomena of interest (Creswell 2012; Palys 2008). Whilst based on subjective judgement, the judgement has to be well-reasoned with practical and logical considerations. The main aim of purposive sampling is to focus on particular characteristics of a population of interest, which will best facilitate answering the research questions (Patton 1990). Regardless of whether purposive sampling serves the qualitative or quantitative research line, it is concerned with variation and frequency as a springboard for analysis, though their form and interpretation differ (Bryman and Bell 2007).

Delimitation of data collection to formal EE (including curricular or extracurricular activities) at the bachelor level forestalls and directs the ensuing selection process of the cases.

In light of the growing recognition of the importance of EE across Europe, the discipline has become better integrated into formal higher education since the end of the post-modern transition in the 2000s (Kyrö 2006). In Latvia and Estonia, EE is a pronounced and regular activity in business schools and management faculties at universities, which makes it easier to be captured empirically. In the international scientific community, the debate around business schools as a far from perfect home for EE has been on for over a decade (e.g. Kirby 2004). However, business schools and management faculties still remain an active channel of EE delivery that absorbs changes in educational trends to meet current socio-economic demands.

For sure, not only is EE an investment in the future for a wide variety of stakeholders from the human capital theory perspective, but also higher education in general is a core investment that secondary school graduates and their parents usually make. The path in higher education begins at the undergraduate level. Graduation with a bachelor degree (either professional or academic) from an HEI is a crucial milestone often equal to obtaining permission to enter professional life. EE, in turn, with its known stakes and bets, over time becomes increasingly empowered to trigger long-term socio-economic change.

Expert sampling

Entrepreneurship educators are expert stakeholders in the teaching process, who implement one of the three teaching models or their hybrids, share their own experiences with students and facilitate the development of competences (Ikävalko et al. 2009). In the qualitative study project, the educators' practices are under investigation requiring focus on individuals possessing the expertise, expectedly at varying levels, in pedagogy and entrepreneurship.

Purposive expert sampling is known to be particularly useful where there is a lack of empirical evidence in an area (Creswell 2012; Bryman and Bell 2007). In spite of the numerous EU initiatives to support EE, including "The Budapest Agenda: Enabling Teachers for Entrepreneurship Education", rather limited evidence can be found either in the scientific literature or the latest pan-European studies about current practices among entrepreneurship educators (EC 2011; Heder et al. 2011). How much do we know about the way entrepreneurship is taught at present? "*Studies into who entrepreneurship educators are and what they really do in their interventions are sorely missing*" (Fayolle 2013:4). The latest international studies on the state of EE in the EU member countries, including Estonia and Latvia, were conducted over five years ago (EC 2010b; EC 2008a; Wilson 2008; Wilson 2007). It was concluded that in the Baltic States study programmes had been deficient in applying an interdisciplinary approach, there had been insufficient use of interactive teaching methods that enable participants with entrepreneurial skills and even knowledge, and the level of cooperation between universities and businesses was diagnosed as low at the time (EC 2010b; EC 2008b). In Europe in general, entrepreneurship was often only perceived in the context of small business management and less than half of the staff teaching entrepreneurship had practical experience in management or entrepreneurship (Wilson 2008). By now, the situation could have improved in view of the active steps taken by HEIs and governments albeit at a different depth and pace.

The selection of the experts was built upon the following criteria. Primarily, the educators had to teach entrepreneurship and/or be experienced in this. If only one individual per institution contributed, she referred the interviewer to another educator who possessed practical experience in entrepreneurship but taught an adjacent discipline (i.e. management). Then, the educators had to work in the HEIs located in the capital cities: Riga, the capital of Latvia; Tallinn, the capital of Estonia, and Tartu, the main university town in Estonia". The capitals attract not only applicants living in the surrounding region(s), where over 30% of the population of Latvia and almost 50% of the population of Estonia are concentrated,

but also applicants from other regions, thus, ensuring access to a wider audience. The respective HEIs cover a wide strata of society, and hence, represent the countries' populations well enough.

To select and invite the contributing experts, a personal professional network was used (i.e. existing contacts) but also some new contacts were established in the leading HEIs. Two interviews per institution were considered enough to reach conceptual saturation in the qualitative study project (Guest et al. 2006; Morse 1995). There are a handful of entrepreneurship educators compared to numerous business educators teaching related subjects (e.g. management, marketing, finance) in higher education in both Latvia and Estonia. They typically work in HEIs renowned for their business education. Most of these institutions are business schools, where EE is likely to be more experiential, and others are traditional universities, where EE is expected to be predominantly traditional. All in all, 16 interviews were conducted (8 per country, 2 per institution). Simultaneously, agreements with the educators were reached about the subsequent survey of their students and graduates.

Homogeneous sampling

Purposive homogeneous sampling is exactly suitable for achieving a sample where units (individuals or sites) possess the defining characteristics or traits (e.g. background, age, occupation) targeted by a researcher (Creswell 2012). The purposefully sampled units form a sub-group of population specific to the research questions being addressed. In this case, the association between details of teaching entrepreneurship and outcomes of the subjects taught are under inspection. The survey sought respondents with a business education background, who studied entrepreneurship, were taught by the interviewed educators, and were aged from around 21 to 25.

The selection targeted final-year bachelor students who are about to graduate and recent graduates from these undergraduate programmes but within two years of obtaining their degree. This time frame was chosen to gauge the short- and mid-term outcomes of EE allowing for comparisons between recent and imminent graduates. The recent graduates had more time to reflect upon entrepreneurship courses and their subjective gain from EE, while for imminent graduates, the learning outcomes were fresh enough in their memories to be evaluated (Henry et al. 2007). If the objective outcomes had not yet matured among the imminent graduates, they were expected to be more visible among the recent graduates. While there is no unifying conclusion in the literature on the relation of some

learning outcomes with its persistence in the long-term future (Lange et al. 2011; Lucas and Cooper 2004), it was important for this study to focus on the influence of EE in the short- and mid-term period.

Due to the fact that study programmes focused on “pure” entrepreneurship were still not so common in the targeted countries at the time of the survey, most of the respondents in the Latvian sample are associated with “Enterprise Management” or “Business Management” programmes; others are representatives of “Finance”, “Public Relations and Advertising Management” programmes or “Economics”, “Finance” specialisations. Respondents in the Estonian sample studied in “Business Administration”, “Economics” and “Business” programmes, among others. The baseline intervention in the form of entrepreneurship course(s) worth 6 ECTS points in total (i.e. a semester or year depending on the study load) unites all the respondents in this research setting.

Overall, the selection procedure ensures sufficient coverage of respondents to test the theoretical framework. Out of a population of all entrepreneurship graduates in one country, the target population of recent and imminent bachelor-level graduates is selected, from which the sample is drawn. Possible self-selection and non-response biases in the quantitative study project are addressed in this sub-chapter following the introduction of the samples.

5.3.2 Semi-structured interviews with entrepreneurship educators

To explore the current teaching practices and gain qualitative hands-on insights, semi-structured in-depth interviews with entrepreneurship educators were chosen as the most appropriate data collection method. Interviews are well-suited for case study research in general (Hancock and Algozzine 2006), but when the number of contributors is limited from the outset, conducting an in-depth interview with every selected educator is certainly preferred over hosting a focus group. The choice of the semi-structured form was predicated upon the dimensions of teaching entrepreneurship (Béchar and Grégoire 2005b) outlined in Chapter 2. At the same time, the process was kept flexible allowing maximum freedom for the respondents.

The interviews were held from April to October 2012 in Latvia and from June to November 2012 in Estonia. Potential contributors were initially contacted by e-mail. The educators were not informed of the practical research purpose behind the interviews (i.e. that their answers would determine identification of the prevailing teaching model), though they were introduced to the theme of the doctoral thesis. The interview questions were enclosed with the e-mail invitations. In compliance

with legal and ethical requirements, confidentiality and anonymity were guaranteed.

The sessions took place in the educators' offices at a pre-agreed time and lasted from 60 to 90 minutes each. As a general rule, they were arranged to be held within one week after the invitations had been sent out. Verbal consent of the educators to audio-record the sessions for transcribing purposes was obtained in advance.

The author had had personal acquaintance with the majority of the expert contributors. She organised, conducted and verbatim transcribed 12 interviews. Four of the 16 interviews (3 in Estonia and 1 in Latvia) were integrated into the Central Balticum Entrepreneurship Interaction (CB Entreint) project (Kozlinska et al. 2013). Two new contacts in Latvia and one in Estonia were established through references received from their interviewed colleagues. Although the elements of snowball sampling were not originally planned, they were accepted in the context of small countries and the relative scarcity of entrepreneurship educators in Latvia and Estonia. All the invited educators agreed to take part in the study. Over a half of the interviews were conducted in the English language. Transcripts of seven interviews held in the Russian, Latvian and Estonian languages were translated into English for analysis by native speakers.

The samples of entrepreneurship educators

The selection process resulted in a somewhat cohesive sample of educators predominantly possessing experience in entrepreneurship or self-employment and in teaching the same or related disciplines. The three newly established contacts were individuals who taught strategic management or management theory, but who could provide valuable insights into EE in view of their practical experience as entrepreneurs, according to their referees. In addition, 1 individual from the CB Entreint project was a professor of strategic management in Latvia. Therefore, in 4 out of 8 cases (3 of those 4 in Latvia), entrepreneurship and management educators were equally mixed. These interviews served as a valuable add-on to the data on EE in 1 Estonian and 3 Latvian HEIs. In some cases EE can still be packaged in management courses. The inclusion of these management educators into the qualitative sample eventually helped map characteristics of EE delivery in 4 HEIs across the operational dimensions of the teaching models framework.

Table 11 below provides descriptive profiles of the interviewees. The HEIs are labelled from A to D in Estonia and from E to H in Latvia to maintain confidentiality. The Estonian educators tend to have slightly longer experience in entrepreneurship and/or industry than the Latvian educators. Likewise, the number

of years in business tends to exceed the number of years in teaching in the Estonian sample. Few entrepreneur-educators had limited experience in teaching. Both samples are evidently dominated by male educators.

The sample of educators is expected to cover the full diversity of EE interventions in Estonia and Latvia. In a practical sense, this underlines the universality of the integrative framework that caters for diverse teaching aims and can be applied to evaluate, trace and compare the learning and objective outcomes of EE relative to the design and delivery characteristics of respective higher education courses.

5.3.3 Survey of entrepreneurship students and graduates

The quantitative data were collected using an online questionnaire-based survey conducted from March to May 2013 in Latvia and from May to November 2013 in Estonia.

The online survey was chosen as an optimal approach to the quantitative data collection because it was by far the only viable method to quickly and affordably target and reach the specific students, who were about to graduate, and who had graduated one-two years ago (i.e. classes of 2012 and 2011) (Creswell 2012). Moreover, it was more convenient for the respondents, providing smoother progress through the questionnaire in the user-friendly Qualtrics platform.

The interviewed educators, student offices, programme directors and in two cases even pro-rectors in the selected HEIs provided with major assistance in disseminating invitations to the online survey. The invitations were the letters of address that introduced the research topic to potential respondents, guaranteed confidentiality and anonymity, asking them to be as sincere as possible when filling in the questionnaire. The e-mails contained a link to the survey on the Qualtrics server. They were sent out twice with a time lag of one to two weeks. Most of the completed questionnaires were submitted in two to three days following the dissemination.

Table 11. Descriptive information about the Estonian and Latvian samples of educators

No.	Country	Age	Gender	HEI	Experience in entrepreneurship	Years in teaching	
						E-ship	Other
1	Estonia	34	Male	A	6 years, consulting and training for marketing, start-ups, self-employment	3	12
2		30	Female	A	6 years, construction industry, consulting and training enterprise, new venture in innovative parking solutions, ICT	5	6
3		54	Male	C	8 years, consulting, experimented with catering; now self-employed	18	25
4		46	Male	B	12 years, consulting, trading different goods	5	10
5		55	Female	D	10 years, consulting and training for business (family venture); a manager in services industry – inspection for price settings		7
6		57	Male	D	Over 20 years, started from corporate management, now owns a number of small enterprises, including a hobby business (solar and wind energy); one of the HEI's co-founders	13	13
7		51	Male	B	Owner and manager of a micro-enterprise, previously a self-employed person, 16 years	10	20
8		56	Female	C	22 years, had a number of enterprises (e.g. import of computers, restaurant, real estate), now self-employed business consultant	19	19
1	Latvia	39	Male	E	2 years of self-employment in consulting and project management	12	12
2		65	Male	F	10 years in corporate sector (oil shale, advanced technologies, M&As, technology transfer), 20 years of executive consultancy, took 1 bio-tech company public (all – in the US)	10	10
3		55	Male	F	16 years of business consultancy (self-employed), 20 years of corporate entrepreneurship (vice-president in economics, finance – marine and aero navigation)	11	11
4		36	Male	H	3 years in publishing business, now – manager in a bank		11
5		42	Male	G	11 years, various activities, but mostly technology entrepreneurship	1	1
6		41	Male	G	19 years in building and construction, real estate and business consultancy	4	15
7		51	Female	E	2 years in business consultancy, 3 years – training manager		14
8		47	Female	H	In the early 1990s, was a director of an innovative theatre	6	13

Qualtrics is modern interactive data collection software providing survey respondents with numerous advantages, such as speed of processing, accessibility via mobile phones, the opportunity to interrupt the completion process at any time and continue later from the same location, a selection of languages, and other features. It is even more useful for researchers. Questionnaires can be protected from double completion, invitations prevented from being treated as spam by e-mail servers, force response, survey flow and question display logic can be set, and so on. The platform automatically manages reminders identifying those, who had not completed the survey yet.

The survey administered as part of the quantitative study project was quite lengthy, demanding 25–30 minutes to complete. Considering that response rates in online surveys tend to be low, some form of incentivisation was required (Smith and Albaum 2012; Bryman and Bell 2007). The addressees were incentivised by being offered the chance to win various electronic gadgets, such as GPS navigators, hands-free and e-readers that would be raffled by the end of the semester. The informal prize draws were organised in June 2013 in Latvia and in November 2013 in Estonia.

In Estonia, the distribution of 1,889 e-mail invitations in 4 HEIs resulted in 218 completed and 74 started but uncompleted questionnaires. The response rate calculated as a number of usable questionnaires divided by the total sample targeted from which the number of uncompleted questionnaires is subtracted, accounted for 12.0% (Bryman and Bell 2007). In Latvia, out of 2,438 e-mail invitations distributed to potential respondents in four HEIs, 341 complete responses were received, 67 surveys were started but unfinished resulting in a response rate of 14.4%.

The sample of entrepreneurship students and graduates

Table 12 provides descriptive information about the samples of students and graduates amounting to 559 individuals in total (N=218 in Estonia and N=341 in Latvia).

The number of recent graduates prevails in both countries: 55% versus 45% in Estonia, 63% versus 37% in Latvia. Out of 121 Estonian graduates, 7% graduated with a bachelor's diploma in 2013, 33% in 2012, 44% in 2011, 10% in 2010, the remaining 6% marked 2003–2008. Only 32 of the graduates proceeded into master-level programmes. Out of 97 Estonian undergraduates, 21.6% expected to graduate in 2013, 62.9% in 2014, 10.3% in 2015, and 5.2% as far as in 2016–2017.

Table 12. Descriptive information about the sample of students and graduates

HEI and bachelor completion, institution share crosstab		Did you complete your bachelor's degree?		Total	Response rate (est.)	HEI share in the sample
		Yes	No			
A	N	44	34	78	25.0%	35.8%
	%	56.4%	43.6%	100.0%		
B	N	12	13	25	12.0%	11.5%
	%	48.0%	52.0%	100.0%		
C	N	19	19	38	6.6%	17.4%
	%	50.0%	50.0%	100.0%		
D	N	46	31	77	10.7%	35.3%
	%	59.7%	40.3%	100.0%		
Total in Estonia	N	121	97	218	12.0%	100.0%
	%	55.5%	44.5%	100.0%		
E	N	55	15	70	10.3%	20.5%
	%	78.6%	21.4%	100.0%		
F	N	79	60	139	12.2%	40.8%
	%	56.8%	43.2%	100.0%		
G	N	74	15	89	27.5%	26.1%
	%	83.1%	16.9%	100.0%		
H	N	8	35	43	18.1%	12.6%
	%	18.6%	81.4%	100.0%		
Total in Latvia	N	216	125	341	14.4%	100.0%
	%	63.3%	36.7%	100.0%		

Out of 216 Latvian graduates, 4% graduated with a bachelor's diploma in 2013, 54% in 2012, 36% in 2011, 3% in 2010, but the remaining 3% marked they graduated in 2005–2009. A total of 51 of 216 continued their educational path into master programmes. Out of 125 Latvian undergraduates, 54% expected to graduate in 2013 (i.e. shortly after the survey was conducted), 43% in 2014, 2% in 2015, and the remaining 1% in 2017.

In both samples the proportion of female respondents prevailed: 67% over 33% in Estonia and 60% over 40% in Latvia. The samples differed, however, in terms of age distribution. Out of 218 Estonian respondents, 52% were aged from 21 to 25, 26% – from 26 to 30, 22% – 31 and over. Out of 341 Latvian respondents, 84% were aged from 21 to 25, 10% – from 26 to 30, 6% – 31 and over. This difference can be explained by the fact that Estonian HEI A and HEI D attracting some mature applicants, who either decided to go back to school or obtain a higher education diploma in slightly later stages of their lives.

Regarding the status of entrepreneurship in the curricula of the Estonian respondents, 84% (N=183) marked they studied the discipline as a compulsory subject, 11% (N=23) as an elective; 3% (N=7) did not study it; 2% (N=5) marked “other” pointing out that entrepreneurship is indirectly linked to other management subjects, e.g. enterprise management. Eighty-three per cent (N=284) of the Latvian respondents marked that they studied entrepreneurship as a compulsory discipline, 6% (N=22) as an elective, 10% (N=35, of which 10 from School A, 16 from School B, 7 from School D, and 2 Erasmus exchange students from School C) did not happen to study the discipline. These respondents in both samples indicated they had no specialist course in entrepreneurship but entrepreneurship-related courses instead, such as the theory of management or organisational theory. Their occurrence can be explained by the presence of four management educators through whom respondents were targeted.

In regard to the form of study, 87% and 77% of the respondents from Estonia and Latvia studied full-time, 11% and 15% studied part-time. However, the distinction between these forms does not carry much meaning in the final stages of bachelor programmes, when imminent graduates tend to look for employment. Technically, those who study in the evenings, are also classified as full-time students, but part-timers are those, who attend educational sessions physically during weekends N times a month.

Annexes 1a and 1b show complete lists of the study programmes the surveyed graduates attended and their proportions in the samples.

5.3.4 Addressing possible sampling biases in the survey

Although some deviations from the target population can be noticed; for example, individuals graduated in 2010 or later, aged over 25, and who expected to graduate later than in 2014, descriptive information on the samples drawn indicate that the targeting was generally correct. Some programme directors or administrators went through the survey themselves beforehand to ascertain the suitability of the content. Other unrelated individuals might have taken part since they were informed by the invited graduates and attracted by the raffle of prizes.

Within the context of a single sample, the respondents grouped by HEI and intervention type are expected to be comparable on a set of descriptive characteristics. Combining the two samples in the course of the quantitative analysis was not considered optimal in this study to keep them as homogeneous as possible. The replicative aspect of the design – following similar procedures in two neighbouring countries to come up with country-specific findings – also supported

transferability and replicability. Preparatory work with the data – the exclusion of non-entrepreneurship graduates from testing the hypotheses, matching the groups – preceded the statistical hypothesis testing. Two sources of biases very common in evaluating the impact of education (i.e. self-selection and non-response) were addressed.

Selection according to HEIs and EE

The most recent local study of patterns of how people of different age groups choose an HEI (Sloka et al. 2007) revealed that secondary school graduates (15–18 years old) are most guided by financial aspects (e.g. state financed places and scholarship options). In addition, recommendations by friends and family are influential for this group as is the likelihood of getting a well-paid job afterwards. For those, who take a gap year, postpone involvement with higher education or think about doing their master degree (19–24 years), the reputation of the HEI and low fees are the most important criteria. In neither of these age groups is study content or quality mentioned as factors affecting the choice of an HEI.

One might still argue that a source of self-selection bias concerns enrolment of the respondents in particular HEIs, since we are uninformed about what considerations drove the sampled individuals. On the whole, the admittance of students to the HEIs was not directly linked to purposefully selecting into either traditional or experiential EE, which was a compulsory part of the bachelor programmes for the vast majority of respondents. In addition, controlling for prior entrepreneurial aspirations and other background variables (e.g. parents-entrepreneurs) mitigates possible self-selection effects in extracting the anticipated outcomes. However, allowing a certain amount of bias related to selection according to HEIs or EE, similar to other studies of this kind (e.g. Rauch and Hulsink 2014; Fisher et al. 2008), might have “*implications for the generalisability of the findings, but not necessarily for the internal validity*” (Piperopoulos and Dimov 2014:7).

To support the sampling adequacy, several tests were run: in the Latvian sample, a comparison of entrepreneurship and non-entrepreneurship students was captured by the survey; in the Estonian sample, a comparison of business and non-business graduates who studied entrepreneurship was captured; and a comparison based on the compulsory or elective curricular status of the discipline was marked by the respondents in both samples. The non-business group was added to the Estonian sample for this purpose. Therefore, some elements of the design of studies

by Rauch and Hulsink (2014), Souitaris et al. (2007), and Berglund and Wennberg (2006) were mirrored.

Non-response bias

Since homogeneous sampling was employed, effectively embedded in the expert sampling, where the number of distributed invitations was nearly equal to the maximum number of potential respondents, a relatively low average response rate does not necessarily signal a non-response bias (Bryman and Bell 2007). Some of the e-mails might not have reached the alumni due to passive accounts. Furthermore, non-parametric comparative tests of completed and uncompleted questionnaires were run on several key variables. It should be admitted, however, that although the non-response bias can be assessed for each sample in general, the same comparison by HEI is not rendered possible.

5.4 Key measures

5.4.1 Interview protocol

The content of interviews was structured along the operational dimensions adapted from the framework of Béchard and Grégoire (2007; 2005b): curriculum, methodology, assessment, environment, regulations, and financing covering questions of didactics and pedagogy, and internally and externally controlled influencers on EE practices. Not counting minor changes in classifying questions and a few eliminations, the interview protocol is a replica of that used in the CB Entreint project. Key topics to be addressed in every dimension had been a result of brainstorming sessions among eight experts who worked in the Centre for Entrepreneurship at the University of Tartu in April 2012. See Table 13 for the list of topics and Annex 2 for the protocol used in qualitative data collection.

The questions on didactics shed light on the aims educators set for their practice, learning content, outcomes expected, formation of student groups, etc., while pedagogy-related questions are concerned with teaching and evaluation methods, authenticity of the learning atmosphere and student progress, to mention a few (Blenker et al. 2008). Questions touching upon externally influenced dimensions uncover, for instance, information on current education policy initiatives, student mentality, the level of university-industry cooperation and EE infrastructure development. Alongside the qualitative snapshot of the current situation and top-

down initiatives, the educators' down-top vertical pro-activity was implicitly assessed.

Table 13. Main topics addressed in the interviews

<i>Dimensions</i>	<i>Topics</i>
1 Curriculum	Main objectives of teaching entrepreneurship Expected outcomes Interdisciplinarity Entrepreneurship curriculum renewal
2 Methodology	Teaching methods The most effective methods Outside classroom activities: living and venture labs, pre-incubators, innovation labs Cooperation with companies
3 Assessment	Assessment methods EE outcomes measurement Student progress evaluation Feedback from students
4 Environment	Students' pro-activity Educator-student barriers Authenticity of the learning atmosphere Management's attitude to EE Learning/teaching materials Distance teaching technologies and software solutions Physical space and technological equipment
5 Regulations	EE in a country's education policy Status of entrepreneurship in curricula Institutionalisation of EE, support structures Training programmes for entrepreneurship educators
6 Financing	Financing of EE Changes in financing structure

The interview protocol was translated into Russian, Latvian and Estonian languages.

5.4.2 Survey instrument

In quantitative education research, an instrument is a tool for measuring, observing or documenting data to measure achievements, assess individual ability or observe behaviour (Creswell 2012). It can take different forms; for example, a test, inventory, tally sheet, observational checklist, but for this study a self-administered questionnaire with a built-in assessment instrument was devised. The integrative framework for evaluating the outcomes of EE already prescribes: a) cognitive,

skill-based and affective outcomes as dependent variables, and form of intervention (teaching models) as an independent variable in the education domain; b) employability, intrapreneurship and early-stage EA as dependent variables in the entrepreneurship domain, where the educational outcomes and form of intervention are potential determinants; and c) prior competences, parents-entrepreneurs and other factors as control variables. This sub-section outlines key measures or bases for the scales that will be tested and used in the statistical analysis. This part of the empirical study is particularly important, since the survey is the major form of data collection in the instrument yielding numerical scores that determine the results.

The instrument comprised three blocks of questions covering entrepreneurial behaviour in real-life settings, educational outcomes, and the background of the respondents. It contained 70 questions in total. The questionnaire is enclosed as Annex 3.

Objective expressions of entrepreneurial behaviour

At the beginning of the first block, the survey flow logic was set in such a way that the respondents were routed into three streams: those who were self-employed, in paid employment or without a professional activity (not working or full-time students only) at the time of completing the survey (Gibcus et al. 2012). Self-employed individuals could be either professionals with or without employed staff, or (co-)owners of companies. Quantitative information obtained from the individuals in paid employment was the basis for estimating employability and intrapreneurship. They were also tracked among self-employed individuals, who worked for other employers before starting their own business (section VI and VII of the questionnaire). Respondents without a professional activity, most of them full-time students, were asked about their current nascent and past entrepreneurial activities (assessed on a dichotomous scale).

Private early-stage EA is a binary variable created by assigning the value of 1 to all the observations when a respondent was a self-employed professional or was trying to start a new enterprise or owned a new enterprise at the time of the survey, and the value of 0 when she was involved in neither of these activities. The measure is adopted from the Global Entrepreneurship Monitor (GEM) (e.g. Bosma et al. 2012), but extended to self-employed professionals considering the target population of young individuals. Other variables related to performance in venture creation and self-employment, such as the number of companies established before and after graduation, level of innovation (Gibcus et al. 2012; Ahmad and Hoffman 2007), employed staff, turnover, and accounting profit served as descriptive data on this outcome (section IV of the questionnaire).

The measure of nascent intrapreneurship consists of two parts. Nascent intrapreneurship I is a dichotomous variable of current involvement in new venture, subsidiary, product or service creation within existing organisations. Nascent intrapreneurship II is a 4-item composite of active participation and role (leading or supporting) in the development of new ideas and their implementation borrowed from the GEM studies (Bosma et al. 2012; Schøtt 2011). Involvement in intrapreneurial activities in the past is controlled for as a dichotomous background variable. Testing the two complementary dependent variables instead of one is expected to return broader information on the predictors of nascent intrapreneurship among graduates.

The measure of employability as an anticipated outcome of EE is an index specifically constructed for this study. On the one hand, it is an accumulative effort in creating new scales differentiating entrepreneurial employability from corporate entrepreneurship based on several sources touched upon in Chapter 4: time span of finding a job, number of employers worked for, number of managerial positions undertaken, promotion to higher positions, and initiation of significant work-related activities. On the other hand, it is an attempt to validate other logically related items, such as coming up with new ideas in everyday work, share of working content control, degree of influence in decision-making, and satisfaction with the content of current work, in the composite. The items were measured using 3 to 6-point scales, except promotion, which is dichotomous.

Learning outcomes

The next block of questions about the learning outcomes of EE starts off acquiring general information on: the status of entrepreneurship in the curriculum (compulsory, elective or not studied), the respondents' form of study (full-time, part-time or extramural), and educational activities the respondents took part in as part of the EE curriculum. The latter was aimed to cross-check conclusions drawn from the interviews on the prevailing type of EE at each HEI. The respondents were offered a list of over 20 activities to select from. The activities represented four broader groups of teaching methods: traditional, based on working life, modelling entrepreneurship and participative (Akola and Heinonen 2008). Answers were used to calculate frequencies of exposure to concrete teaching methods.

Another important indicator of the type of EE as well as a possible predictor of changes in cognitive, skill-based and affective states of learners is attitudes to educators (Ikävalko et al. 2009; Kraiger et al. 1993). More open, simple, supportive, equal and interactive relationships are a sign of demand-competence

models. Closed, complicated, indifferent, hierarchical and formal relationships are more tied to supply-demand models. The state of relationships was assessed on a semantic differential 5-point scale. The amount of training viewed as a precursor to the transfer of learning is not controlled for explicitly in the study because everyone on average received an equal intervention worth 6 ECTS points (Goldstein 1991, in Kraiger et al. 1993).

The following group of questions within this block dealt with prior competences of the entrepreneurship course participants. A number of studies pointed out the significance of prior knowledge, experience (Williams and Lombrozo 2013; Ineson et al. 2013; Matlay 2008) and career aspirations (Zellweger et al. 2011; Krueger et al. 2000), which students possessed before being enrolled. These questions were answered using a 4-point scale: “I knew nothing”, “I knew a little”, “I knew something”, “I knew a lot”; “I had no experience”, “I had small experience”, “I had some experience”, “I had vast experience” coded from 0 to 3 (a “Hard to say” option was also available, re-coded as “0”); answers to the fourth question ranged from “Definitely no” to “Definitely yes” on a 5-point Likert scale. These questions made it possible to compare the initial and resulting level of the respondents’ competences, and also served as statistical covariates or explanatory variables in further analysis. Drawing upon the works of Thorndike, Piaget and Bandura, contemplated in Chapter 2, successful learning transfer is easier to achieve if new knowledge is similar to the task that needs to be performed, and when it is similar to the task-related knowledge already stored in one’s cognition.

The outcomes of educational interventions are most often assessed by respondents themselves in education research (Poole and Iqbal 2011). Likewise, entrepreneurial competences, or entrepreneurship-related human capital assets, tend to be measured using subjective measures as concluded in Chapter 3. Although it can be argued whether perceived learning outcomes are a suitable proxy for entrepreneurial competences, as far as entrepreneurial activity is concerned, judgements of one’s own ability to perform and to succeed appear to make a greater effect on executing related behaviour than having this ability *de facto* (Aidis et al. 2008; Krueger and Dickson 1994) or in contrast to measuring this ability using external indicators such as grades (Schaper and Casimir 2007).

Assessing the perceived outcomes of educational interventions is a well-accepted practice in education research supported by several reviews documenting the validity of self-assessments (Kraiger et al. 1993). Indeed, when students enter a programme, they are usually aware of their level of knowledge and skills in a certain field. Later, as they exit the programme, the students’ perceptions of their own knowledge and skills are supposed to change as a result of the learning

process. The more confident a student is about her competences, the higher the likelihood she will act in a desired direction in the future (Krueger and Dickson 1994). The viability of affective learning measures, including the task-based self-efficacy in this approach, has been proven multiple times (e.g. McGee et al. 2009; Krueger et al. 2000; de Noble et al. 1999). In addition, since the influence of experiential EE is of particular interest, one more reason to rely on the respondents' judgements is that people tend to remember better those learning experiences that were action-based and meaningful to them (Kolb 1984).

The survey participants were asked to retrospectively assess change in the levels of their entrepreneurial knowledge and skills that occurred as a result of EE on a 5-point Likert scale. They also had to indicate their level of agreement with statements related to affective outcomes, including passion towards entrepreneurship, attitude to risk and failure, entrepreneurial self-efficacy and other outcomes (e.g. sense of self-reliance, ambitiousness, attitude to new learning). The wording of these questions was replicated from Fisher et al. (2008). The underlying items were compiled from several sources: Fisher et al. (2008) and Gibb (2005), doctoral dissertations by Lorz (2011) and Izquierdo (2008), and the European Commission's study on the impact of entrepreneurship programmes in higher education (Gibcus et al. 2012).

Table 14 specifies all the items offered for respondents to assess according to the type of outcome. The learning outcome measures are meant to capture the learning outcomes of entrepreneurship courses, but they have wider evaluation implications for a whole range of entrepreneurship-related curricula (business management, marketing and the like), since managerial knowledge and skills acquired in other courses are related to entrepreneurial competences (Man et al. 2002). Therefore, the resulting scales are also expected to reflect the content of interventions in the analysed countries.

On top of that, the survey contained a question on entrepreneurial intentions measured using just one item, which is the likelihood of starting up a new enterprise in the next 10 years (assessed on a 5-point Likert scale).

Table 14. The educational outcome items self-assessed by the respondents using a 5-point Likert scale

<i>Cognitive learning (17 items)</i>	<i>Skill-based learning (24 items)</i>	<i>Affective learning (19+ items)*</i>
<p><i>Fisher et al. (2008):</i></p> <ul style="list-style-type: none"> • business plans and their constituents • general principles of financial accounting • project management • business communication • positioning and branding of products and services • integrated marketing communications <p><i>Lorz (2011):</i></p> <ul style="list-style-type: none"> • business modelling • team management • entrepreneurship process • attraction of financing • lean start-ups <p><i>Gibcus et al. (2012):</i></p> <ul style="list-style-type: none"> • role of entrepreneurs in our society and economy <p><i>Izquierdo (2008):</i></p> <ul style="list-style-type: none"> • development of new products and services • opportunity recognition • evaluation of business opportunities <p><i>Other items:</i></p> <ul style="list-style-type: none"> • legal aspects of establishing an enterprise • theories of entrepreneurship 	<p><i>Fisher et al. (2008):</i></p> <ul style="list-style-type: none"> • lead a team • resolve conflicts • deal with uncertainty, adapt to new and uncertain situations • work across teams and functions • identify and analyse risk • conduct marketing research • prepare cash flow for a firm • be a valuable team-member • work with others, who are different from me • work out a marketing plan • set priorities and focus on realistic goals <p><i>Gibb (2005):</i></p> <ul style="list-style-type: none"> • solve creative business problems • negotiate deals with other businesses <p><i>Lorz (2011):</i></p> <ul style="list-style-type: none"> • write a business plan • manage business risks • devise business models • identify unmet needs of people • develop innovative working environment • attract potential investors to my endeavours • develop new products and services <p><i>Izquierdo (2008):</i></p> <ul style="list-style-type: none"> • evaluate pros and cons of business ideas • keep good interpersonal relations <p><i>Gibcus et al. (2012):</i></p> <ul style="list-style-type: none"> • organise and control on-going projects • build up professional networks 	<p><i>Fisher et al. (2008):</i></p> <ul style="list-style-type: none"> • I am confident in my ability to start an enterprise • I want to start a new/one more enterprise • I like taking business risks – it excites me! • I am sure I can be a good leader of a team. <p><i>Lorz (2011), Izquierdo (2008):</i></p> <ul style="list-style-type: none"> • I can rely on myself in any uncertain situation • To be an entrepreneur and have my own company is my true passion • A career as an entrepreneur suits me well – it gives me freedom and autonomy • For me, failure is a valuable outcome of the process of doing • I tend to take my chances, even if I might fail • I feel self-confident when talking to successful entrepreneurs • I will make every effort to start a new enterprise, when I aspire to it • I am keen on new learning. <p><i>Gibcus et al. (2012):</i></p> <ul style="list-style-type: none"> • Usually I set ambitious goals for myself • I want to achieve more than most other people • I openly question how things can be improved • Among various options, I would rather be an entrepreneur • My professional goal is to be an entrepreneur <p><i>Other items:</i></p> <ul style="list-style-type: none"> • I always try to find innovative solutions to arising or existing challenges • It is vital for me to grow and develop constantly

*the full list of statements can be found in Annex 3

Table 15. Summary of key variables

Variable type	Description	Measurement type, scale
Dependent/ independent	Cognitive outcomes*	Continuous (scale), 5-point Likert
	Skill-based outcomes*	
	Affective outcomes*	
Dependent	Employability*	Continuous ordinal (index)
	Nascent intrapreneurship I (ventures/subsidiaries, products/services)	Categorical dichotomous
	Nascent intrapreneurship II* (idea development and implementation phases)	Continuous (scale), 2-3 point
	Private early-stage entrepreneurial activity	Categorical dichotomous
Independent	HEIs/form of intervention	Categorical nominal, split into dummies
Independent/ control	Number of entrepreneurs in personal network	Continuous, 5-point scale
Independent- background/ control	Parents-managers, Master student status Past intrapreneurship Prior work experience	Categorical dichotomous
		Continuous, 4-point scale
Match covariates/ independent/ control	Gender, age, parents-entrepreneurs	Categorical and continuous
Match and statistical covariates/ independent	Prior knowledge, entrepreneurship experience, career aspirations in entrepreneurship	Continuous, 4- and 5-point scale
Statistical covariates/ independent/ control	Graduate status	Categorical dichotomous
	Attitudes to educators	Continuous (scale), 5-point semantic differential/Factor scores

*Notes: more detailed information about these multi-item measures will be provided in the following chapter.

Background of respondents and other control variables

The third block of questions sheds light on the respondents' background simultaneously providing a battery of control variables such as gender, which has been extensively researched for a number of years (Johansen and Foss 2013; Rouse et al. 2013; Ljunggren and Kolvereid 1996); the occupation of their parents (entrepreneurs or managers), whose influence was previously discovered to be

ambivalent (Zellweger et al. 2011; Lussier and Sonfield 2010); and personal networks, which it has been suggested are crucial for entrepreneurial success (Johannisson 1988). Parental occupation and number of entrepreneurs in a personal network are also elements of social capital either in hand from the outset or potentially built up during studies (Hindle et al. 2009).

The sample composition prescribed accounting for the status of respondents in terms of the completion a bachelor degree. In view of the unplanned variation in age, this is also controlled for in the analysis of both types of outcomes.

Information on the belongingness of respondents to a particular HEI obtained in this block is instrumental for the study. Based on this information, the respondents are classified on the basis of the form of intervention. The original grouping by HEI is also retained for comparative purposes and in anticipation of the specificities of EE delivery likely to enter the discussion during the qualitative study project.

Table 15 summarises key variables contained in the survey instrument underlying the quantitative study project.

Independent variables and covariates as well as qualitative measures used in the two study projects help retrieve systemic data on EE design and delivery, relevant organisational or environmental characteristics of the HEIs implementing EE, and the learners; in other words, the three main clusters of factors known to influence the transfer of learning (Subedi 2004; Goldstein 1991, in Kraiger et al. 1993) that feed into testing the hypotheses in this study.

5.5 Methods and tools for the data analysis

5.5.1 Qualitative study project

The interviews conducted with entrepreneurship educators were audio-recorded, transcribed and coded using the computer-assisted qualitative data analysis software NVivo (version 10.0.368.0 SP3) developed by Australian company QSR International in 1999 (Lee et al. 2010). The software is especially valuable for processing large numbers of interviews or voluminous transcripts, and for creating text data matrixes to compare responses among educators, to explore connections and reveal hidden patterns in the data (Creswell 2012). NVivo helps systematically store and structurally or visually display data in one place.

Content analysis was performed involving a two-stage coding process. Coding also known as a form of quantification in qualitative research is an inductive

process of structuring and narrowing data into manageable codes and themes (Bryman and Bell 2007). Themes, or categories, are similar codes aggregated together to convey a major idea that follows from the data. Typically, frequency of occurrence of similar opinions, phrases or meanings is calculated. This method of analysing qualitative data stems from the grounded theory approach typically applied when there are few theories established in the field (Strauss and Corbin 1990).

The semi-structured interview format suggested concrete themes-dimensions (Table 13 in sub-section 5.4.1 above), within which the transcription texts are coded into initial and focused categories, or information containers, called nodes in NVivo (Lofland and Lofland 1995).

The software does not do the analysis but instead provides a researcher with an interface and functions to perform the analysis. Above all, the application of NVivo is a marketable skill that facilitates and enriches qualitative research.

5.5.2 Quantitative study project

The quantitative study project was carried out using the IBM software package SPSS Statistics 23. If not referenced otherwise throughout the analysis, this work benefited a lot from the online tutorial Laerd Statistics (Lund and Lund 2013).

The processing of quantitative data started with preparatory tests, such as non-parametric Kruskal-Wallis and one-way analysis of variance (ANOVA), to justify the sample selection and check the comparability of the groups. This was followed by the evaluation and validation of the tripartite competence framework measures.

Following recommendations for assessing research models by Coltman et al. (2008), the first part of the proposed integrative framework falls into a reflective type characterised by existing latent constructs independent of the used measures, items manifested by the constructs, causality from the construct to items, interchangeability of the items, identifiable error term, amongst other features. With this type of model the ordinary least squares regression, for instance, does not seem appropriate since when applied to a single equation from the proposed system it would produce biased parameter estimates as a consequence of ignoring simultaneity (Asteriou and Hall 2011). Furthermore, single equation models neglect the structure of co-variance in the data, and therefore, can produce less stringent or even misleading results (Florit and Lladosa 2007; Schreiber et al. 2006).

This part of the quantitative project employed structural equation modelling (SEM) using the analysis of moment structures (AMOS) add-on to SPSS. SEM

makes it possible to estimate a series of separate, though interconnected, equations for modelling the learning outcomes of EE as well as to consider complex links among them (ibid 2006). Since the devised conceptual framework already prescribes indicators, or observed variables, for the underlying latent variables (i.e. cognitive, skill-based and affective outcomes), confirmatory factor analysis (CFA) using AMOS as the first step in SEM was employed to examine whether the collected data fits the framework, and to create three independent outcome constructs (Obadia and Vida 2011). On the second step, the structural model was devised comprising the estimated learning outcome constructs (Hair et al. 2010). It tested the assumed directionality of relationships (Obadia and Vida 2011). The maximum likelihood method was employed to perform estimations. The number of observations was sufficient to use SEM in both samples ($N > 200$) (Hair et al. 2010).

Following previous studies and recommendations (Obadia and Vida 2011; Zampetakis et al. 2011; Hooper et al. 2008; Carson et al. 2006), the reliability (similar to Cronbach's alpha) and validity (average variance extracted) of the estimated constructs as well as goodness-of-fit measures are assessed, including: a) indicators of absolute fit (chi-square test, goodness-of-fit index); b) indicators of incremental fit (normed fit index, comparative fit index); and c) parsimonious fit indicators (root-mean-square error of approximation, normed chi-square). Absolute measures show the overall model fit; incremental measures compare the proposed model to a hypothesized single-factor baseline model with no measurement error; and parsimonious measures adjust the fit measures for the degree of "overfitting" that might occur if there are not enough degrees of freedom (Hair et al. 2010). The values for adequate fit from Hooper et al. (2008) and Hair et al. (2010) were followed.

Application of the SEM method is not completely novel in EE research (e.g. Zampetakis et al. 2011; McGee et al. 2009). Yet it is rare, if compared with regression (e.g. Zhang et al. 2013; Lange et al. 2011; Kolvereid and Moen 1997) and exploratory factor analyses (e.g. Barakat et al. 2011; De Noble et al. 1999). SEM itself is a combination of factor analysis with multiple regressions and is a more stringent analytical procedure (Hair et al. 2010; Schreiber et al. 2006). In relation to EE outcome measurement specifically, it is fairly new at present.

Based on the validated scales, a correlation analysis of the learning outcome types was conducted in SPSS as well as the stepwise mediation regression that made it possible to account for control variables in confirming or disconfirming the result achieved on the second stage of SEM in AMOS.

Then, the analysis of co-variance (ANCOVA) was used to determine whether significant differences existed between predominantly traditional and experiential teaching and their learning outcomes adjusted for a range of covariates.

Estimating employability and intrapreneurial activity in the second part of the integrative framework is classified under a formative type of measurement (Coltman et al. 2008). Confronted with the absence of ready scales for employability, a composite was newly constructed from the range of variables captured by the survey instrument; that is, items defining the composite. The composite does not exist as an independent entity. Any change in one of its components causes a change in the composite score. The same is true for the scale for nascent intrapreneurial activity phases. The direction of causality from items to constructs thus differs from the reflective type (ibid 2008).

A number of regression models were run in SPSS to estimate the anticipated association between the objective outcomes and learning outcomes of EE including: a stepwise multiple regression of employability and of involvement in idea- and implementation phases of intrapreneurial activity, and binary logistic regressions of nascent intrapreneurship and of private early-stage EA.

Chapters 6 and 7 proceed with the content analysis of the interview data and the statistical analysis of the survey data.

6 QUALITATIVE DATA ANALYSIS AND RESULTS

The qualitative research project aimed to gain insights into dimensional characteristics of interventions in entrepreneurship at the 8 HEIs in Estonia and Latvia, and to identify the teaching model pursued by the educators at each institution. This study project not only set the qualitative background for the ensuing statistical analysis, but also contributed to the empirical evidence on the interaction of the dimensions and the convergence of their characteristics in the teaching models in EE (Bécharde and Grégoire 2007, 2005b). This also shed light on coherence among curriculum, methodology, assessment, environment, regulations and financing dimensions (e.g. Biggs 1999), as well as the alignment between teaching aims, methods, outcomes, and other operational elements of EE design and delivery educators control directly (Fayolle 2013; Matlay 2006). Alongside that, the study project informed and updated our knowledge on who entrepreneurship educators are and how the discipline is taught in the region at present.

The work on the qualitative data began by formatting the 16 interview transcripts before importing them into a new NVivo project. The ensuing content analysis consisted of two coding stages: the initial and the focused coding (see Annex 4 for an overview of the procedure). This aimed at exploring the operational dimensions of the teaching model framework introduced in Chapter 2. Relying on this exploration and a comparison of the researched HEIs along dimensional lines, the institutions were positioned in the supply, demand, and competence or hybrid models of teaching entrepreneurship. As a result, the prevailing type of EE intervention at each HEI – either traditional or experiential – was diagnosed.

6.1 Definitions of entrepreneurship

Prior to exploring the state of entrepreneurship teaching dimensions at each HEI, it was useful to specify more deeply how the interviewed educators actually define entrepreneurship. As among scholars, who choose definitional stances most appropriate for their studies, the views of educators might reflect the nature of the teaching practices, choice of methods as well as the aims and outcomes targeted.

This links directly to the “Curriculum” and “Methodology” dimensions. Personal understanding of the phenomenon also informs us of how the educators communicate its meaning to students and what intellectual roots they rely upon (e.g. economics, management or entrepreneurship as a pioneered field).

Table 16 summarises the definitions by country and by HEI. For ease of perception and quicker reference, the educators are given imaginary names. The individuals in possession of a PhD degree are marked with a star (*), though they do not necessarily maintain a research track record. On the whole, the Estonian educators came up with more contemporary, entrepreneurship-specific definitions underlying the process-based and new value creation perspectives. In the Latvian sample, there were few instances of more economics- and management-driven definitions that emphasised the resource based view (Chris) and ownership value maximisation (Sander). On the whole, the educators tend to perceive entrepreneurship as spanning beyond the private venture creation boundaries.

At some HEIs, the educators communicated quite similar definitions. For example, Maria and Matthew from HEI D emphasised value creation. Similarly, Rob and Richard from HEI B referred to the aspect of creation, though Rob explicitly pursued the new enterprise or organisation creation stance as the one and only. In the Latvian sample, Jack and Dan from HEI G, who possessed less experience in teaching the discipline than almost all other educators (except John) across the two samples, yet being experienced entrepreneurs, established a tight agreement on opportunity as a central concept of the phenomenon. Hannah from HEI C, the most experienced entrepreneurship educator and entrepreneur, focused her definition around fulfilling dreams and taking risks. Aaron, the oldest respondent by age but the most experienced in both pedagogy and entrepreneurship in the Latvian sample, shared a rather non-traditional, anti-resource based view, alongside expressing his agreement with the newest definition of the European Commission that focuses on one’s ability to turn ideas into action.

6.2 Findings from the Estonian sample

6.2.1 HEI A: John and Jill

John and Jill work at a historically traditional academic institution that puts strong emphasis on lecture-based teaching. Over a hundred students from “Business Administration” and “Economics” study programmes attend entrepreneurship courses annually. John teaches “Principles of Entrepreneurship I, II” (3 ECTS each) in the 2nd year of a 3-year bachelor programme as well as the related disciplines

“Project Management” and “Marketing” (also 3 ECTS). Jill teaches “Introduction to Entrepreneurship” (3 ECTS) to 1st year bachelor students.

Table 16. “Entrepreneurship is...”

Country	HEI	Name	Age	Definition	Essence
Estonia	A	John	34	...a set of skills and knowledge that makes ideas come true through a natural cycle starting from opportunity recognition, an idea to its execution.	Opportunity Process Change
		Jill	30	...willingness to change the world to become a better place.	
	B	Rob*	46	...an ability to create new enterprises.	Creation
		Richard*	51	...creation of something out of nothing.	
	C	Leo*	54	...an activity that is directed towards satisfying the needs of people in a new way.	Innovation Satisfaction of needs Risk-taking Fulfilling dreams
		Hannah*	56	...when people take risks and fulfil their dreams, give opportunities to other people to work for them.	
	D	Maria*	55	...when you do something and add value to that what you do.	Value creation
		Matthew*	57	...an activity, through which aims to produce value are being achieved.	
Latvia	E	Chris	39	...an economic activity initiated by an individual-entrepreneur who came up with an idea and combined existing resources to create new products/services and new values, which satisfy needs and wishes of people.	Resources Satisfaction of needs Self- realisation Societal value
		Sarah*	51	...self-realisation through business achievements for the benefit of the society at large.	
	F	Aaron*	65	...getting something accomplished without controlling your resources (+EC formulation: ability to turn ideas into action requiring creativity, innovation, risk-taking, ability to plan and manage)	Getting things done Enacting ideas
		Alex*	55	<i>not applicable (the question was omitted during the interview)</i>	
	G	Jack	42	...creating new things, making them happen – pursuing opportunities.	Opportunity Creation
		Dan	41	...about how people identify and exploit opportunities.	
	H	Sander*	36	...an activity, through which an entrepreneur multiplies ownership value.	Returns max. Innovation
		Patricia	47	...innovation and creative destruction.	

a) *Curriculum*

The pedagogical aims John and Jill set differ slightly but all fit into the supply-demand teaching model balancing between developing a personality knowledgeable about entrepreneurship and an entrepreneurial personality. John aims to widen the entrepreneurial knowledge and beliefs of students as well as to provide them with certain tools (possibly meaning skills). Jill is more concerned about developing entrepreneurial mindsets and personalities apart from knowledge and skills in business planning. Her principal aims connect well to the quite original definition of the phenomenon as “*a willingness to change the world to become a better place*”.

Table 17a displays the aims that the educators set against the outcomes they expect. As a matter of fact, John does not target any specific outcomes in his teaching practice at the institution (although he expects to develop student knowledge and skills in the case of some extracurricular training he is involved in). Jill, like other educators in the samples, wisely notices that fulfilment of teaching aims is the expected outcome.

Table 17a. Pedagogical aims set and outcomes expected by John and Jill

	Aims set	Outcomes expected
John	-“ <i>To develop the knowledge and belief levels, the way students see the world, business or entrepreneurship as well as to give certain tools</i> ” to them.	-“ <i>In case of university lecturing, I have not set any special target outcomes.</i> ” -“ <i>...start-ups should be a side effect of the university teaching</i> ”.
Jill	-“ <i>The most important is to create entrepreneurial mind-set, willingness to become entrepreneurial</i> ”. -“ <i>Students should know the basics about starting business; to develop knowledge and ability to write a business plan</i> ”. -“ <i>Developing entrepreneurial personality should become more dominant</i> ”.	-“ <i>Expected outcomes are that objectives would be fulfilled</i> ”. -“ <i>To increase the number of students who say that they would like to become an entrepreneur</i> ”. -“ <i>To encourage developing one’s life plan</i> ”.

Reflecting on how well the aims are achieved, John thinks that universities do not have to increase the number of start-ups, but to do something valuable. “*There should be ‘cool projects’ that create value, but how to sell it, it is not my or the university’s task*”. This stance leaves the question of measuring the outcomes of EE open as also follows from the characteristics of the “Evaluation” dimension. Jill, in turn, hopes and feels that her teaching increases the level of curiosity in

entrepreneurship. She also assumes that knowledge, skills and attitudes are developed simultaneously during her course.

The content of John's courses covers the entrepreneurship process, opportunities, business modelling, finance, high-growth ventures, marketing and other classical themes. John tries to structure the course along the lines of the process-based logic borrowed from Baron and Shane (2008). Content-wise Jill begins with explaining and discussing what entrepreneurship is in general and what is important in starting a company. She also shows that the process is iterative and continuous; hence, even a very good business plan written only once is not enough. Jill, like John, covers "*typical business topics*": personality, finance, marketing and other aspects.

Both educators are responsible for the content and curriculum renewal themselves. Study programme content that is process oriented is an ontological feature of the competence teaching model, yet the content itself is driven by scholarly needs rather than student needs, which associates the intervention at HEI A with the supply model. The prevailing homogeneity of the student groups is another element indicating the supply model. Taking into account the key characteristics of the "Curriculum" dimension, the institution can be positioned on the border between the supply-demand and demand teaching models.

b) Methodology

John relies on traditional lecturing in his classes. However, numerous real-life cases are used to briefly explain theoretical concepts and give the learning a more practical angle. "*I give a concept and explain how it can be applied in 5-7 minutes*", says John. During the lectures, John also gives short assignments usually in the form of open-ended questions that have to be completed in small teams of 2–3 people; afterwards, all the ideas are shared and mind mapped. The lectures-to-other-methods ratio is approximately 3:1.

Among the other methods there are business planning and case studies, most often used as part of homework. There are a number of extracurricular, voluntary activities taking place outside standard classrooms such as an interdisciplinary entrepreneurial idea development project "Idea Lab", a business plan competition "Brainhunt" and a hackathon "Garage 48", but less than 20% of John's bachelor students tend to sign up for those activities. "Idea Lab" is the one and only interdisciplinary project in the sample that gathers students of different backgrounds to work on "*cool ideas*" together that does not have to result in new enterprise creation. At this level, cooperation with companies takes place too. The

companies are usually keen on participating in start-up competitions for marketing and recruitment purposes, according to John.

The educator rarely invites practitioners from industry or entrepreneurs to deliver guest lectures, because he doubts the students would benefit from this method. Such speakers might inspire, but as John puts it “*they are usually poor at explaining and actually teaching*”. This method needs serious preparation to guide an entrepreneur through what kinds of things to speak about and to prepare the students how to learn from these talks.

John is also one of the few educators in the Estonian sample who use reflective feedback as a teaching method. Either at the end of each lecture or right after, he collects short reflection forms where students share 3 items they learnt, 2 questions they had but did not get answers to, and 1 topic they want to learn more about. So far, though, John has not had enough time to try out such teaching methods as role plays or real-life simulations of different entrepreneurial scenarios, or lectures by students and learning diaries.

Jill sees business planning as an important aspect of practice during seminars that complements standard lecturing. She also notices that internal regulations impose restrictions on the proportion of seminars-to-lectures as well as on active learning in general. For this reason, her teaching time is equally distributed between theory and practice. Jill did not have the resources for using pre-incubation or incubation facilities when working with student teams. Company visits have not been practiced either by Jill or John.

Assessing the methodology dimension, HEI A can be located on the border between supply-demand and demand teaching models. The teaching methods can be diagnosed as using a “predominantly traditional approach with experiential learning opportunities existing outside formal curriculum”, because the institution is still a few steps away from the demand model methodologically with most learning concentrated inside classrooms and some restrictions on action-based learning. That said, it is also one of the two institutions, where students are asked to reflect upon their learning experiences as part of the educational process.

c) Assessment

John formally uses a summative type of assessment. However, apart from standard grading, he also attempts to establish regular feedback loops with his students, thus stimulating learning through evaluation that is known as formative assessment characteristic of the demand and competence models. He would be willing to use pre- and post-course testing, since otherwise it is difficult to assess

how students advanced. There are no exams, but final grades are based on a homework project.

Jill finds grading in entrepreneurship courses “nonsense”, so she uses only “pass or fail” evaluation to comply with the official requirements. Team-working skills can be assessed separately, she recognises, because the performance of a company in the business world depends on a team as a whole. Jill thinks that her students are doing fine: “*It seems that they are happy and successful*”. She tends to rely on constructive feedback from the students in improving her teaching.

Both John and Jill have heard about a few graduates launching new enterprises, but no systematic tracking of the alumni career paths or specialist system for measuring EE outcomes exist. The absence of this measurement and the summative assessment formally adopted by the educators even though they are free to choose an evaluation approach they prefer (“*I can grade students in a way I choose myself – no requirement from my institution*”, John says), with some formative evaluation elements and reflective feedback sets HEI A in the supply-demand model zone.

d) Environment: social and physical

John’s and Jill’s students are moderately proactive during classes. Sometimes, John has to repeat a question two-three times before “*a speaker emerges and breaks the silence*”. Jill even forces the students to engage more in order to pass the course. John thinks that this attitude comes as a habit from high school, which keeps them silent if they are unsure an answer is right and prevents them from engaging in discussions to come up with new solutions.

Both educators find that it is important to incorporate the fun factor and humour into the teaching routine to help the students open up and relax the learning atmosphere. To make it closer to real life, John brings examples from the business world or personal experience, but Jill believes that the course should be 3 semesters long to increase the level of authenticity (e.g. for launching student enterprises).

In general, the management of HEI A is positive towards EE, and its perceived importance has skyrocketed recently. However, they have also been very conservative about adopting pedagogical novelties if initiatives come from inside the institution, and not from the Ministry of Education and Science.

John is not particularly satisfied with the teaching space because the classrooms have very bad acoustics. This has not been a problem for Jill though.

In developing their teaching materials, the educators have not been using entrepreneurship textbooks except for the one that pursues a process-based view of the phenomenon and is written in Estonian by prof. Tõnis Mets. Textbooks in general are very traditional, John notes. That is why he uses “*different stuff, more*

lean start-up, Steve Blank's approach". There is some suggested but no compulsory reading. However, John understands "*it should be changed, because students think that all knowledge is contained in PowerPoint slides*". He tries to update the teaching material every year and develop himself as an educator. "*Every time after a course I think that next time I should make it much better. That's my internal wish. To improve in such a way that students learn and my teaching is fun. So far students do not take away much, which is a problem*". This honest response by John is fully in line with his earlier views on the outcomes expected and their achievement.

Jill uses quite a lot of video material, worksheets and comprehensive slides instead of asking the students to take lecture notes. Often the students have to browse the internet and find relevant extra material themselves. In general, Jill is satisfied with the teaching equipment provided, although "*sometimes big posters for developing a business canvas could be useful where you can put your post-it notes*". She concludes that the teaching materials help her achieve the aims set.

Considering John's and Jill's responses, HEI A is positioned in the supply model because EE takes place in standard classrooms and lecture amphitheatres, within which it is harder to create an authentic learning environment. Cooperation with industry or other forms of ecosystemic support as part of curricular learning have not been spotted.

e) Regulations

According to John, EE has been one of the state education policy priorities since 2010/2011. "*On paper entrepreneurship should be on all levels of our education system, we should have teacher training, we put a strategy for entrepreneurial Estonia, and we approved it at the European level...*". However, concrete actions are still to follow. The first step at the national level has been made, and it is already important. Jill adds that it is only lately that EE has begun to find more supporters at the HEI. Its status has switched from elective to compulsory.

At the time, the discipline was institutionalised at HEI A through the Centre for Entrepreneurship – a structural division responsible for EE. Its founder also created the concept of Ettevõtluskodu® (Entrepreneurship Home) – a service that provides interested students with advisory services and mentoring in entrepreneurial initiatives. Jill always offers that students can contact her after the course is over. John often encourages students to take part in the Idea Lab or the Brainhunt competition. While admitting that the strength of the existing support measures is yet to be built upon, he does not believe in "the one gate approach" which caters for all needs. "*Does not matter whom you ask, it's enough if she is competent*

enough". Jill, in turn, thinks that in spite of the existing efforts, "*EE is still too theoretical*".

HEI A provides special courses in general pedagogy for educators, but obviously not in EE pedagogy. John says that these courses require time and commitment, so that even if he has time he is not sure whether he wants to undertake the commitment. Jill has not expressed an interest in attending these courses so far.

EE support at the policy level and the existence of an entrepreneurship support structure at HEI A indicates it follows the demand model, yet the EE system within the school is still only starting to form, there is no professional development for entrepreneurship educators, who do not always possess satisfactory experience in pedagogy and are not eager to attend even the general courses on offer for educators. Therefore, the school can be located on the border between the supply-demand and demand models.

f) Financing

The situation with financing is quite stringent. The structural division is provided with headcount funds, but these are "*not sufficient to have constant staff*" that is de facto financed from European projects. Payments for teaching as such are very low on the part of the HEI. Jill fully confirms this.

John does not anticipate any changes in the financing structure, while Jill thinks the amount of funds will increase given new plans to make entrepreneurship a university-wide discipline. John would very much prefer to be paid well enough by the institution itself. "*The good side of the projects is that we do not have to follow the official rules of lecturing*", he parries. Jill also believes that salaries should be raised. "*An educator should be well motivated, that's the most important thing. Sometimes she needs to be a mentor and available to give qualitative advice also after the formal lecturing hours*", she rightly notes.

At present, this HEI is clearly set within the supply model in terms of the "Financing" dimension.

6.2.2 HEI B: Rob and Richard

The second HEI has been operating in the country for nearly a century and offers a range of technology, law and business programmes, although most often students are kept within one discipline cohort. Group sizes usually range from 30 to 50 students. Rob teaches "Entrepreneurship Basics" (3 ECTS) in the 1st year and Richard delivers "Entrepreneurship" (4 ECTS) in the 2nd year of a 3-year bachelor programme.

a) *Curriculum*

In this HEI, the pedagogical aims of the entrepreneurship educators are complementary. While Rob wants to show that company creation and management is possible for anyone, Richard tries to help students make well-grounded career choices. Both also aim to convey the knowledge necessary for setting up and managing your own enterprise, while not mentioning skills explicitly in their answers to this question. However, judging by the outcomes they expect (Table 17b), Rob puts more emphasis on the managerial side. Richard does not seem to directly expect new start-ups from his graduates, yet he is certain that some of them will set up their own enterprises very soon, others will do so at some point in future. *“...the fact that they have covered business studies contributes to more reasonable, more conscious behaviour and to the success of their company”*, he says. This suggests that implicit curricular ambitions in HEI B are beyond just teaching about entrepreneurship, or the supply model, which seems to dominate in this dimension.

Table 17b. Pedagogical aims set and outcomes expected by Rob and Richard

	Aims set	Outcomes expected
Rob	<p>- <i>“To show that company creation and management are not sophisticated, that people who are doing this are similar; if they can, you also can”</i>.</p> <p>- <i>“To teach concrete theoretical things – like accounting”</i>.</p>	<p>- <i>“Outcomes – as always, on paper, what pedagogical process aims to achieve.”</i></p> <p>- <i>“My goal is not to make more entrepreneurs. If you get high salary in a company, dedicate yourself to narrow but profitable niche, that’s fine”</i>.</p>
Richard	<p>- <i>“To help students in making well-grounded career choices and to provide them with necessary knowledge for setting up their own businesses”</i>.</p>	<p>- <i>“Students get a general idea on the development of entrepreneurship, on being an entrepreneur”</i>.</p> <p>- <i>“Assessing one’s own suitability to be an entrepreneur, a more grounded career choice”</i>.</p>

Richard thinks that he is doing generally well in achieving the objectives set, but notes it is always possible to do better. Rob admits he could do better, but is currently doing as well as he can. There are also several factors influencing the achievement of the outcomes, including limitations set by the economic environment and the secondary education system that *“tends to spoil its pupils”* in getting them used to a right-wrong attitude than exploring things. In the world of entrepreneurship, sometimes there are no right or wrong answers, Rob recognises.

“May be out of 10 crazy ideas, one good idea comes. If you bring 10 medium good ideas, nothing comes out”. Both educators can recollect some successful alumni-entrepreneurs, but as a matter of fact do not have any systematic figures on the number of companies initiated or the career paths of their alumni.

b) Methodology

Rob offers *“ordinary teaching, lectures and seminars”* that, as he says, are 100% theoretical because practice means going out and doing business, which is incompatible with studies. Action-based learning is labour-intensive. He is aware of experiential learning, but believes that *“if one is doing something s/he should be dedicated to this activity; if you are studying, you cannot do business properly; if you are doing business, you most probably do not have time to study”*. This stance, however, limits the contemporary understanding of experiential EE and the interplay of action, reflection and creation inherent to it.

Rob does use such methods as business plans and simulations (iPlanner software popular in Estonia), but he is convinced that the theoretical part is more important. *“At least students get something, the minimum programme in a short time”* he says. Rob’s students also visit companies to see how they function. A few attend the *“Brainstorm”* competition and get credit points for that. On rare occasions study groups attend trade fairs and companies give them exercises to solve.

Richard, in turn, applies a combination of different methods: traditional lectures, case studies, group discussions, creativity exercises and a lot of independent work, which includes developing and assessing business ideas, business modelling and planning. The lectures-to-other-methods ratio is 2:3. From time to time the students take part in business competitions (e.g. Brainhunt); this outside classroom activity is extracurricular. University-industry cooperation is not a part of the teaching methodology. The educator focuses more on the process of setting up a business and modelling, and *“in this case such cooperation does not fit very well”*. He invites practitioners sometimes, as they *“diversify the benefits students learn from the subject”*. Richard does not know any methods he is not using.

In summary of the methodology dimension, the educational intervention in HEI B is located in the supply-demand model. It is a predominantly traditional approach that combines classical teaching with business modelling and a process perspective on entrepreneurship.

c) Assessment

Rob uses summative assessment methods. Part of the course grade comes from an open-question exam and bookkeeping exercises; another part is from business planning. Richard follows similar lines of summative assessment having a range of course assignments that make up the largest part of the final grade and a final written examination. In the case of group projects, he tends to use peer evaluation to optimise the process. Neither Rob nor Richard recollect any evaluation methods they are aware of and are not using.

There is no system for measuring EE outcomes or alumni tracking. Rob thinks his students “*do learn something*”. Best ideas are always visible. “*Some people are just saying that they achieved something. Others are saying the course is nice, but it’s better to stay in the company and earn good money*”, notes Rob. Richard thinks it depends on individuals as always: some students are more hardworking, others more talented, so he has not noticed any significant changes lately.

Both educators collect feedback on their courses and modify assignments or content accordingly.

With the exception of the occasionally used peer evaluation by Richard, HEI B falls under the supply model on this dimension.

d) Environment: social and physical

The level of pro-activity among Rob’s and Richard’s students varies. Some of Rob’s students study in the evenings, so when they arrive a bit tired, he does not want “*to push them too hard, since it’s against their will*”. Richard does not spot any significant obstacles to his relationship with the students. Rob, in turn, points out that his efforts as an educator are limited with the logic of economic geography meaning that to try out something really innovative the students should go outside the country, “*where the money is*”. People in peripheral economies do not take big economic risks, he argues.

Both educators find the attitude of management supportive towards EE; there is a realisation of the importance of teaching entrepreneurship. Yet, the educators do not mention concrete top-down support measures.

Ensuring the authenticity of the learning environment is problematic in HEI B. Rob admits he does not connect students to mentors, but generally students with the relevant family background tend to do better: “*to some extent it gives the real stuff*”. Richard confirms he is not personally engaged in practical training. “*We tackle the problems of real life through case studies, homework, and bachelor’s theses*”. However, he tries to bring his own experiences into the classroom; for example, to deal with the peculiarities of different kinds of businesses and

bureaucracy including registering an enterprise, organising accounting, and reporting. Richard also tends to refer to some examples of interesting business ideas or cases “*that are attractive due to their humorous nature*”.

Rob and Richard are fully satisfied with the physical space and equipment provided. “*Everyone has a seat and a table, there is a board and a projector. Could there be something more? Does it make sense in entrepreneurship training? I would rather say that in the current circumstances – no*”, summarises Rob. He develops his own teaching materials using textbooks. So does Richard, though he sometimes lacks time to upgrade them.

On the whole, the “Environment” dimension positions HEI B in the supply model.

e) Regulations and financing

Rob and Richard confirm that EE is generally supported at the state education policy level, and positive measures are gradually applied to enhance the role of EE. However, Rob adds that so far the support is mostly rhetorical. He suggests that the education system as such has been underinvested in for the last two decades. Investments were made in the renovation of buildings, but not in the salaries of educators starting from primary school. The latter affects everyone at the later stages of the system. Both educators do not foresee any significant changes in financing EE at their institution.

Not counting natural differences between some study programmes, entrepreneurship is a compulsory subject. Rob questions, however, whether it should be. “*The scale of returns works in such a way that there are extremely talented people, talented, medium and lower than medium... Definitely for the top 5% it does not make sense, because they are good enough already; at the bottom there are 20% who are not motivated at all...*”. Therefore, the logic would work better if entrepreneurship was an elective subject, Rob concludes.

In terms of professional development training, some courses in general pedagogy run from time to time. There are no targeted support centres for students except for the formal careers advisor.

Given the education policy support, HEI B can be located in the supply-demand teaching model in the “Regulations” dimension. Since the institution faces similar challenges as HEI A in terms of financing with virtually no internal support for EE development, it is also positioned in the supply model.

6.2.3 HEI C: Leo and Hannah

The third HEI is one of the largest and most prominent privately owned business schools in the Baltics founded in the late 1980s. Entrepreneurship and enterprising people are at the core of its corporate values. The school tends to attract applicants motivated to learn though competition for places is not as high as in the Latvian HEI G. Leo teaches “Business Basics” (3 ECTS) and Hannah is in charge of “Student Enterprises” (3 ECTS).

a) Curriculum

The pedagogical aims of Hannah and Leo appear to be different though adjacent. Leo is more inclined towards the demand model with his introductory course, during which he tries to make students understand what type of entrepreneurship suits them most (a managerial path being one of the options, see Table 17c). By the end of Leo’s course, students should come up with ideas to work on during Hannah’s course. Hannah, in turn, as an experienced educator and entrepreneur, with an obvious passion towards entrepreneurship, pushes all students out into the real world to experience entrepreneurship and become successful in creating or managing their own companies in the future. Therefore, Hannah clearly pursues the competence teaching model. Since it is a business school, opportunities to form teams of students with diverse educational backgrounds are quite limited.

Table 17c. Pedagogical aims set and outcomes expected by Leo and Hannah

	Aims set	Outcomes expected
Leo	- “Provision with opportunities for evaluating what type of entrepreneurship suits my students... They do not have to set up a company straight away”. - “Graduates managing a company...”	- “The results must correspond to the aims”. “...Awareness of the opportunities and risks related to entrepreneurship is the most important thing, when a person gets a clear idea of whether they need the company at all, to act as an entrepreneur...”.
Hannah	- “All of them must go to business – every alumni member must be successful: create companies or manage them”.	- “The outcomes are equal to the objectives”.

Leo commences the course with an introduction, and then builds the basic structure upon input from the participants (e.g. based on discussion of homework). Structuring topics and content is more flexible and oriented towards learners, around more practical inputs, which again brings Leo's practice to the level of the demand teaching model. Hannah writes her own textbooks and structures the course content around her own view and understanding of entrepreneurship. The materials are free for her students, but are priced for everyone else outside the school.

In regard to achieving the outcomes, Leo parries the question by saying "*it depends*". He thinks it is important to have a network of university incubators that could foster the emergence and growth of successful companies. In other words, although the educator neither aims "to produce entrepreneurs" nor expects new enterprises to emerge as a result of his course for that matter, at the back of his mind Leo still contemplates the creation of new high-growth enterprises as an outcome of EE.

Hannah, in turn, suggests that all of the school's alumni get employed. A lot of them become managers in existing companies; others establish their own enterprises. Quite many graduates settle down in other countries. One of the key success factors is the strong network graduates build while students at HEI C. Their alumni rather cooperate than compete with each other.

Bringing the key topics of the "Curriculum" dimension together, the school can be positioned in the demand-competence model area.

b) Methodology

Standard lectures, seminars and group work constitute only a small part of Hannah's teaching process, which is essentially learner-centred. The methodological emphasis is on implementing business ideas and real-life projects, for which students bear the responsibility themselves; the educator takes on the role of a mentor. Every student who has graduated from HEI C has been in business. In most cases, according to Hannah, this career path suits her students well. Very often, they already come with a positive predisposition towards entrepreneurship and business.

"Business Basics" which Leo delivers is a theoretical course that has to be passed prior to "Student Enterprises". During the course, students acquire basic theoretical material, do case studies, come up with new business ideas to be implemented and write business plans. "Student Enterprises" is a practice-based course that has been running since 2000. It enters the curriculum in the very first year and runs for three semesters, during which the students develop and put their

business ideas into practice. Students start up in teams of 2–10 people. “*We meet in classrooms once a week, then I let them swim (but I am here all the time advising). In 2 semesters I expect them to become rich*”, says Hannah. The quality of the business ideas certainly varies. In most cases they are not very innovative, but still okay for the bachelor level. Sometimes Hannah’s students also take part in the “Brainhunt” competition. On top of that, if the educator sees a need in a company visit, she can arrange it in half an hour. Hannah is very satisfied with the methods used, and is sure there cannot be anything more efficient than the approach already employed.

In Leo’s teaching, lecturing, homework and practical projects account for around one third each. He does not think that everyone should be forced to set up a company while studying. For Leo, learning in international student teams is important as it helps prospective start-up companies map international business opportunities. He therefore expresses interest in making the student enterprises scalable. Leo also systematically uses reflective feedback as a method of teaching and assessment. He requires students to complete self-analysis questionnaires. Some results and feedback are then discussed during classroom meetings. The only method Leo does not use as unfavourable is bulky Harvard case studies since they do not fit very well with the curriculum and the local context.

The institution has a strong alumni association (of around 1,000 entrepreneur-graduates), which helps some student enterprises secure start-up capital. Three times per semester alumni are invited as guest speakers. Cooperation with companies exists as part of the real-life student projects.

Methodologically, the educational intervention at HEI C fits with the competence model focused on establishing new enterprises. Unlike other schools, it shows many features of social constructivist learning that includes both salient action and reflection components.

c) Assessment

Leo evaluates students on the basis of their homework, examination papers, and contribution to group work using both formative and summative elements. On top of the earlier mentioned self-evaluation questionnaires, Leo regularly uses peer evaluations to assess term papers in entrepreneurship. He only sees one method of assessment – that he is not using – as inappropriate, and that is external examinations. Inviting an external examiner “*is also labour-intensive and does not help learning*”, thinks Leo.

Hannah relies on team evaluations in her work. Usually, a team leader grades other members of the team as well as her own. In the meantime, Hannah “*does*

nothing, just gives advice if needed”, at the same time being in full control of the learning process. *“If they fail, I will be there. They tell me, we are friends. I know what they are doing and where they are”*, Hannah explains.

As the interviewer captured, there is no direct system of measuring the outcomes of EE, but there is a system of collecting course feedback and tracking alumni at the school. Leo says that a lot of questions are asked in this process, even too much, but also admits that they should pay more attention to alumni-entrepreneurs with regard to more long-term feedback. Hannah says that the marketing department does measure the outcomes, though they mainly collect feedback.

In terms of the students’ recent progress, Leo finds *“there have always been students who are more successful than others and those who have no achievements”*, and it is rather difficult to assess. At the end of Hannah’s course she hosts a discussion of the results. Then everyone writes a reflective report on what they learned, and Hannah compares the report with the team leaders’ grades. At the end, she comes up with the final grade herself. Therefore, reflection is used both as a teaching and an assessment method.

HEI C is a straightforward “inhabitant” of the competence model zone judging by the state of the “Assessment” dimension, in particular, the purposeful use of reflection, peer- and team-assessment as well as striving for systematic long-term graduate tracking.

d) Environment: social and physical

Leo characterises his students as generally proactive, they value practicality a lot and *“they should think a bit more outside the box”* by definition. Likewise, Hannah says that her students are very energetic, entrepreneurial, pre-motivated – other kinds of people would not survive. She sees no obstacles to her productive relationships with the students. *“They are my friends, very loyal and dedicated”*. Hannah also tries to use the fun factor in her practice as often as possible, but Leo confesses he should do this more often. For him, the only serious problem is that students tend to be employed and lack time for their homework even though they are not entrepreneurs yet.

Leo comments on the attitude of the management to EE as follows: *“in a small private school it works so that if you do something yourself, nobody says you shouldn’t”*. Hannah confidently responds that the management trusts her in a sense that she is authorised to set her own “rules of the game”. *“They hired me to do what I am doing. I am the business person here, not an academic”*.

Authenticity of the learning environment in Hannah's course is built into the real-life projects students are responsible for. Leo responds that "*if the student composition is right, then the real problems should arise through homework or examination papers, students raise these themselves*". Indeed, the educational activities that can be used inside classrooms are quite limited in terms of ensuring authenticity.

Hannah is completely satisfied with the space and equipment provided at her disposal. There are also two electronic business games offered as open electives, for which students get credit points. The games run during weekends for everyone interested.

Leo is in general satisfied with the teaching space as well, but he adds that tables could be arranged better for team work and more white boards provided. He is not completely happy with the technological equipment, because reading Power Point slides from a screen is not convenient for everyone. Leo often distributes old-fashioned transparent papers that students work on in groups.

In summary, HEI C can be located within the demand-competence model for this dimension. While the students acquire the basics during Leo's course, the learning environment cannot be 100% authentic.

e) Regulations

Discussions about incorporating EE into the education system starting from kindergarten have been in the policy arena for some time already, suggests Leo. At the policy level, EE is supported in the country. Hannah feels she is further away from these issues, but thinks that it is supposed to be supported despite a somewhat cautious attitude towards entrepreneurship in society. The subject has the status of being compulsory in this school. It is institutionalised through a respective chair and the Centre for Entrepreneurship.

Several courses in pedagogy are available for the educators through the Primus programme. Hannah says that she has specifically taught other educators on EE. In terms of her own growth, she has learnt a lot from the Indian universities, and she also acts as the head of the school's Indian department.

Student enterprises are all eligible for mentorship schemes. Hannah acts as a chief mentor. Students have a well-equipped lounge and a meeting room at their disposal, yet there is no incubator within the school.

HEI C features key characteristics of the demand model in the "Regulations" dimension.

f) Financing

As a private institution, the school sources its funding primarily from students. Participation in a number of European projects in cooperation with Enterprise Estonia also contributes to the total turnover. Leo would like to see more development projects coming into the school. Hannah is completely satisfied with the state of financing for her educational practice.

Leo suggests that the financing system should be re-organised in such a way that it is less dependent on the EC projects and ordinary sources from students to attract other opportunities. EE in the school is generally well supported financially; in other words, resources are dedicated towards its further development. However, the system is still far from “self-feeding”. The resulting diagnosis for the “Financing” dimension is the supply-demand model that is the only case alleviating the school from the experiential models range.

6.2.4 HEI D: Maria and Matthew

HEI D is a private professional university specialising in entrepreneurship that was founded in the early 1990s. Matthew teaches “Entrepreneurship” (6 ECTS points), while Maria is in charge of the “Basics of Management” (3 ECTS points) course.

a) Curriculum

Matthew aims to increase awareness about entrepreneurship, what it means and takes to be an entrepreneur. Maria aims at making her teaching valuable for students in terms of takeaways to be used in working life. As Table 17d shows, the aims set match the outcomes expected. They indicate the classical “teaching about entrepreneurship” mode that dominates in HEI D. One detail that came up during an interview with Maria still brings a feature of the demand model in this dimension. Maria lets her students bring up their own cases from real-life during seminars; these are mostly work-related managerial issues that are then discussed among peers and may influence the course in general.

b) Methodology

At the time, entrepreneurship was delivered in a rather traditional way in this university: lectures, seminars, case studies and heavily oriented on business planning as a tangible output. Distance learning is organised for some groups of students who live outside the city. Company visits also take place – students visited a minimum of five companies of different types: intellectual, manufacturing, agricultural, etc. Before every visit, they have to prepare thematic questions and reflect on possible answers themselves.

Table 17d. Pedagogical aims set and outcomes expected by Maria and Matthew

	Aims set	Outcomes expected
Maria	- <i>“To give students something they can use in their working life”</i> .	- <i>“The students use the takeaways from my courses in their lives”</i> .
Matthew	- <i>“To know what entrepreneurship is, what it means and takes to be an entrepreneur (it is not work, it is a lifestyle)”</i> .	- <i>“1) To make some students realise entrepreneurship is not for them – in time; 2) To make everyone understand that this alternative exists for the future”</i> .

Matthew and Maria do not invite practitioners into their classes because at least half of the teaching personnel possess experience in either entrepreneurship or business management, and are currently active in the industry. The students of this institution do not usually take part in outside classroom activities except for company visits since they tend to be a bit older than the average high school graduate and are already employed.

Maria had not used problem-based learning, but was about to attend a course for educators on that topic in the Netherlands. She was also the only educator who developed an entire electronic course herself: videos, written materials, tests, additional reading. Matthew, in turn, acknowledged there were plenty of methods he had not used due to time limitations.

Since, the institution has recently shifted towards a more systematic experience-based learning in teams. Entrepreneurship is now taught as a six-module package comprising basics of entrepreneurship, management, ethics, innovation, accounting, finance, etc. (total value: 30 ECTS). There are minimal contact hours (1 ECTS), but in the form of seminars. Lectures are all video-recorded and available online. *“Information has to be free for everyone, but the application of this information is not because it is linked with expertise”*, says Matthew.

All in all, at the time relevant for the quantitative analysis, HEI E was methodologically close to the supply-demand area, where entrepreneurship was taught in a somewhat traditional way and geared towards business planning with some outside classroom learning activities such as company visits.

c) Assessment

Maria and Matthew fully rely on a standard, summative form of assessment that clearly indicates the supply teaching model. Maria thinks that students do develop professional competences as a result. When they first come to lectures, they do not know much. As the course progresses, so do they, judging by their course work. The students also start thinking about what to improve in the companies they work

for. Maria adds that as part of the programme some students have internships at existing companies.

The university keeps contact with some alumni, and keeps “*an eye on the media to see what the students are doing in real entrepreneurship life*”. Matthew confesses that the measurement of EE outcomes and alumni tracking is a weak point of the school.

Feedback is collected from students on a regular basis, though it is rather general than specific. The best educators get rewarded.

d) Environment: social and physical

Maria and Matthew have observed that students differ year by year. In one cohort, students can be very active, want to speak out and bring up their own cases for discussion. In another cohort, there might be 20 people unwilling to speak. Maria tries to engage everyone, but she is not always successful. Quite often students have families, they work and study at the same time. Commitment is not a problem, since they pay for their studies. They want to get real results, not only an official diploma. Matthew recognises the level of activity and commitment depends on the age group. Younger students that come straight from secondary school are less active, while older and more experienced students understand the subject matter more deeply.

Maria tries to bring her experiences into the classroom as much as she can. Matthew, likewise, and his practices in EE are fully based on practical experience.

Maria evaluates the management’s attitude to EE as positive and supportive, while Matthew is a representative of the school’s board himself. He has been an active enthusiast and supporter of EE since the early 1990s.

In developing teaching materials, Mathew is guided mainly by his own experience. In 2011, the university published the very first textbook on entrepreneurship for local secondary schools.

E-learning is quite popular at the school. This includes business games such as “Business Basics” used since 2003, a Swedish 2-day game for bachelor students, and “Dinamo”, mostly for Master students.

To sum up, in the “Environment” dimension, HEI D can be located within the supply-demand model, given the long-term support of EE in the institution.

e) Regulations and financing

The existence of policy support does not greatly affect the daily operations of HEI D. Matthew is convinced that real outcomes are of the least interest to the

policy makers. No funds were provided for the entrepreneurship textbook that the school published.

The school tries to keep up with recent EE trends. Maria takes part in at least one in-service week per year. Matthew attends several workshops and conferences in other universities.

Entrepreneurship is a compulsory subject for all students at HEI D, but there is no other institutionalised support except for informal support. All the school’s educators are experienced in either entrepreneurship or industry, which is one of the recruitment criteria.

Financing issues are a weak point, Matthew acknowledges. The school is financed from tuition fees alone, and more funds are needed for EE development and teaching materials.

There is policy support, further professional development for educators and internal EE initiatives at HEI D, but the absence of entrepreneurship support structures locate it within the supply-demand model for the “Regulations” dimension. In terms of financing, the supply model is a clear-cut diagnosis.

6.2.5 Prevailing form of intervention

Figure 4 summarises the results of the teaching model diagnostics at the Estonian HEIs.

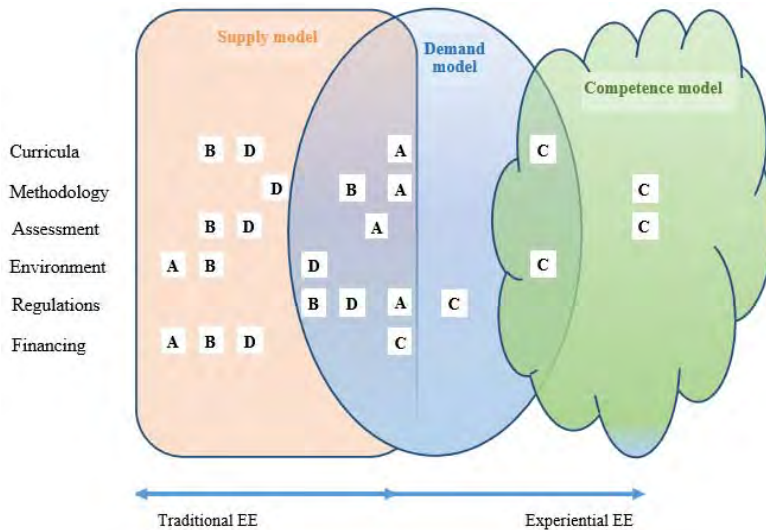


Figure 4. Teaching models at Estonian HEIs by dimension

It shows that HEI C is evidently pursuing the most experiential approach to EE, focusing on the learners and their needs, developing entrepreneurial personalities and prospective entrepreneurs. HEI A is the closest to the demand model among the remaining schools, yet is still diagnosed with “predominantly traditional” EE and located in the hybrid zone on four out of six dimensions. HEIs B and D are balancing between the supply and supply-demand models, and so clearly implementing traditional, teacher-centred EE.

Other insights from the analysis are summarised in Annex 5.

6.3 Findings from the Latvian sample

6.3.1 HEI E: Chris and Sarah

HEI E is a state funded business school operating on the Latvian higher education market for over 20 years, and is one of the most prominent in the country. Chris teaches “Basics of Entrepreneurship” (6 ECTS points) in the 1st and 2nd year of a 3-year bachelor programme. Sarah is one of the three Latvian management educators who contributed to the study; she delivers “Enterprise Management” (4.5 ECTS points) in the 1st year of the programme.

a) Curriculum

The aims of Chris’ teaching practice are to stimulate the students to become entrepreneurs and to determine a personal fit with entrepreneurship. He does not want to be a promoter, but lets students understand the benefits and risks of being an entrepreneur, and how entrepreneurs work and think. Chris also wants to convey the basic terminology, to teach the students how to plan and analyse the business environment. Sarah has a concise aim of providing the students with a set of necessary competences for establishing and running their own businesses.

As Table 18a below outlines, Chris expects four outcomes from his practice that in general correspond to the aims set. He gives the impression of being a classical, rational educator, which is also traceable in the way he defines the phenomenon. Sarah, in turn, sees knowledge and attitudes as the main outputs, while aiming to develop entrepreneurial skills for starting up new enterprises and running them successfully. Therefore, we can identify the elements of, on the one hand, the competence model that should run in the “education for entrepreneurship” mode, and on the other hand, the supply-demand model.

Chris thinks he achieves the outcomes generally well, judging by the course feedback. Sarah acknowledges that within the timeframe given and considering the quite large group sizes (approx. 50 people), the aims are sometimes difficult to achieve. She also adds that the outcomes are also heavily dependent upon her colleagues because EE is a collective effort.

Table 18a. Pedagogical aims set and outcomes expected by Chris and Sarah

	Aims set	Outcomes expected
Chris	<i>“To stimulate students to become entrepreneurs. To determine a personal fit with entrepreneurship”.</i> <i>“To teach terminology and business planning”.</i>	<i>“Well... accordingly: 1) knowledge of terminology, value of entrepreneurship; 2) understanding of entrepreneurship, what it means to be an entrepreneur; 3) basic principles of planning and starting an enterprise; 4) analytical skills.”</i>
Sarah	<i>“To provide necessary knowledge, to develop the skills and abilities to establish and run a business successfully”.</i>	<i>“To understand business as a system, and to develop an entrepreneurial attitude”.</i>

The composition of the study groups leaves little space for inter- and trans-disciplinary work, which is typical for business schools.

Chris and Sarah take part in the curriculum renewal systematically. When planning out the course content, Chris is often guided by intuition and his own experience (teaching, textbooks, international practices, etc.). Group specificities are always taken into account so that he tries to skip finance and management topics when teaching to finance and management students.

Overall, the school can be positioned closer to the border with the demand model on this dimension.

b) Methodology

The teaching methods Sarah and Chris use are not always aligned with the aims pursued. The determination of a personal fit with entrepreneurship and, *par excellence*, the development of the competences to successfully establish and run new enterprises clearly aim for experience-based pedagogy. However, the core teaching and learning activities at HEI E only take place inside classrooms, including lectures, business planning, industry analysis, case studies, role plays, practical group work (reports on a given topic and presentations), and individual home assignments that primarily require analytical thinking. Industry analysis might include interviews with entrepreneurs, but it seldom does. Rarely do students

take part in extracurricular activities such as business plan competitions. Practitioners, mostly the school's alumni, are often invited as guest lecturers, but they do not engage deeply with the educational processes.

The university-industry cooperation is limited to formal internships that students are required to undertake as part of the professional study programmes. Chris reasons that visits to enterprises are not used because it is quite hard to organise them. The use of simulations and business games would require curriculum changes. He and Sarah find time limitations and large group sizes the main obstacles to making their teaching more experiential.

The EE teaching methodology at HEI E fits the supply model characterised as traditional.

c) Assessment

Chris and Sarah employ standard summative evaluation methods denoting the supply teaching model. The industry analysis, which is an individual task, makes up over a half of the final grade. Each activity, including attendance, has its own weight. The educators have not thought about alternative assessment methods. Their perception of the progress that students make during their courses is positive. They do not specify whether this view is based on the feedback that programme directors collect or formal grades. The systematic measurement of EE outcomes does not exist in the school, and the practice of alumni tracking is at an initial phase.

d) Environment

Students from the "Enterprise management" programme are much more interested in entrepreneurship than finance students, but their analytical skills are worse. According to Chris, they sometimes find it hard to meet the formal requirements. Over the years, students have become more interested in practical work and are less willing to attend lectures. This is related to one of the obstacles Chris brings up. Somewhat similar to Rob's observation in the Estonian sample, he notices that the level of student responsibility in the study process plummeted alongside the level of secondary school preparation. Technological progress makes pupils less able to focus, read and analyse. They are also becoming more arrogant and often argue with lecturers over grades. In Sarah's view, students are generally proactive, but sometimes they are busy preparing homework for an upcoming class. To tackle this, she tries engaging them into discussions personally.

Both educators are trying to bring personal entrepreneurial experience and knowledge into the classroom by recollecting relevant cases, telling stories and jokes.

The general attitude of the school's management to EE is positive nowadays, and it strives to promote an entrepreneurial spirit. HEI E plans to open a pre-incubator for students in the near future.

Chris is quite satisfied with the physical environment; all the necessary components are there, but he is not a demanding person. In contrast, Sarah does not find the facilities satisfactory referring to them as “*old-fashioned*” and “*giving no space for observation and involvement*”.

The school does not use distance or technology-based education such as simulations or company creation software and webinars.

The current state of the “Environment” dimension constrains HEI E to the supply model.

e) Regulations and financing

According to Chris and Sarah, EE is not prioritised in Latvian education policy. Subsequently, it is not supported financially.

Entrepreneurship is a compulsory discipline at HEI E, but the school does not have any special support unit or other forms of institutionalising entrepreneurship. Similarly, it does not provide educators with opportunities to enhance their expertise in EE.

The diagnosis for the state of the “Regulations” and “Financing” dimensions at HEI E is quite straightforward: the supply model.

6.3.2 HEI F: Aaron and Alex

HEI F is one of the prominent private business schools in the country. Entrepreneurship at this school is taught within a number of study programmes, such as “Enterprise Management”, “European Business Studies”, “Public Relations and Advertising”. Aaron, the oldest educator in the sample, teaches “Entrepreneurship” (6 ECTS points) or “Entrepreneurship and Business Planning” (6 ECTS points). Depending on the programme, the courses are taken in the 1st, 2nd or 3rd year of studies. Students from the first two programmes also attend “Strategic Management” (6 ECTS points) in their 2nd year, which is taught by Alex.

a) Curriculum

Aaron aims to open students up to discover their own strengths and weaknesses and to induce a mind-shift towards entrepreneurial thinking and behaviour. He has no expectations of graduates becoming entrepreneurs, but rather that they develop more entrepreneurial personalities as per the demand teaching model. Alex is more

oriented towards management learning, aiming to prepare students to work for a large company upon graduation. Subsequently, Alex expects them to become not only ordinary employees, but obtain supervisory positions. See Table 18b for the exact quotations.

Table 18b. Pedagogical aims set and outcomes expected by Aaron and Alex

	Aims set	Outcomes expected
Aaron	<i>–“A mind-shift towards entrepreneurial thinking and behaviour. To open students up, make them go beyond the common inferiority complex, to find their own strengths and uniqueness”.</i>	<i>–“I do not expect them to become entrepreneurs, but to give them ambition, vision and inspiration. To change their logics from causation to effectuation”.</i>
Alex	<i>–“To enable students to make a strategic analysis, diagnose the environment, determine competitive advantage and maximise the firm value. To prepare for work under supervision of English-speaking management”.</i>	<i>–“Achieved aims are the outcomes”.</i> <i>–“Better competence in terms of customer understanding and appeal... To become partners with a company so that they could be supervisors of the process rather than dependent”.</i>

Some of Aaron’s students do extremely well, others “flow through”; as for the rest that are a minority, he wishes they could do better. Alex says that the achievement of outcomes varies, but the main indicators are exams, and the defences of bachelor and master theses.

In the last few years, opportunities for interdisciplinary learning in the school increased with the launch of study programmes in advertising, public relations and architecture, although they are not yet exploited in EE.

b) Methodology

Aaron tries to balance experiential learning with academic rigour in his practice. He employs a diverse set of activities ranging from effectuation exercises and Harvard online simulations to business planning and portfolio management, including cross-cultural and creativity exercises, videos from professional agencies outlining specific entrepreneurial cases, problem-based learning, business plans for increasing sales, role plays, negotiation cases and elevator pitches. Students also do 5–10 company visits per year. To ensure that they get real learning value in exchange, Aaron gives them real-time assignments/asks questions to check their understanding of on-going issues. Presentations of analyses of a case company to a panel of experts (representatives of boards, venture capitalists) are also part of his

practice. Sometimes entrepreneurs are invited as guest speakers; co-teaching is one of the distinctive methods used in this school. The educator does not believe in business competitions based on business plans, and therefore, they are not included into his “arsenal of methods”.

Alex relies heavily on a case study approach in teaching. The structure of his load is evenly split between theory, case studies and seminars, where work on cases integrates both seminars and theoretical lectures. Alex has not used problem-based learning that he understands as being case creation by the students, and thinks this would be very useful in future once it is acquired.

In every way, EE is predominantly experiential at HEI F and can be positioned in the demand-competence model from the methodological viewpoint despite a strong emphasis on action rather than reflection. It features quite diverse experiential learning activities and case-based management education.

c) Assessment

Aaron tends to rely on performance-based assessment as is common in the competence teaching model. At the same time, “*class attendance is part of the grade on the basis that we are doing a lot of experiential activities*”. Student performance in Harvard online tests, simulations, problem solving sessions, discussion of quizzes and Dragon’s Den shows or the like is assessed. However, the educator does not disclose how this is done exactly and what criteria apply.

In terms of the progress his students make, Aaron is quite satisfied when they show better results in online tests at the end of the course than the beginning, but if they integrate entrepreneurship concepts into their personal lives, Aaron feels he has accomplished the best result. In some cases, however, he “*cannot break the silos and narrow their thinking*”.

Alex approaches assessment in a more formal way. Following a lecture, students work on a case in groups, then present a solution and receive feedback or advice from Alex. The final grade is based on 4–5 tasks of this kind. Alex has not tried grading lecture summaries so far.

Study programme administrators collect general student feedback that is then considered to improve the delivery of the courses.

As in all the other schools, there is no system for measuring EE outcomes. The educators do not mention alumni tracking either.

Considering the evaluation practices of both educators, HEI F can be diagnosed as being within the demand-competence model in this dimension.

d) Environment

From Alex' viewpoint, the students at HEI F tend to be active and think innovatively, yet they are also quite demanding. He even finds the school's environment challenging: "*If it is not a show, it is hard to keep their attention for more than 10 minutes*". There is no polarisation between weak and strong students, but something has changed since the crisis so that the groups are smaller, and the students have become more focused. Alex sees no particular obstacles to his attitudes with the students or to the teaching process. Aaron still finds that it is difficult to involve the students in elevator pitches, to open them up. He also notices that Latvian students are reluctant to go international.

The management of HEI F is quite supportive and flexible towards new EE initiatives. While Aaron initiates and arranges 90% of the company visits or guest lectures from entrepreneurs himself, the school's vice rector has also been helpful in building connections with entrepreneurs and industry.

Aaron and Alex prepare all teaching materials and renew them on a regular basis. However, they are not quite satisfied with the physical environment. Aaron often experiences frustration because he can never be sure the software is up-to-date and that he can run particular videos, even in the same classrooms he once taught in. There is no telephone line in any of the auditoriums, while accessing video-conferences he needs both the internet and a phone line. Alex adds that PCs could be more modern. Only Aaron uses distance teaching technologies upon his own initiative.

In spite of Aaron's efforts, the current environmental factors taken together do set certain constraints on HEI F placing it on the border between the supply-demand and demand models. These constraints are likely to be related with funding and regulatory issues.

e) Financing and regulations

Aaron and Alex reiterate what Chris and Sarah stated, confirming the state does not prioritise EE in its education policy. The budget is very small, only EU projects help, but even this is done on a low cost basis. The market for high quality expensive courses is almost non-existent, says Aaron, because he cannot invite top speakers and pay them 15 EUR per hour. Alex adds that the country cannot afford the Finnish experience because there are simply no funds for that.

Entrepreneurship is a compulsory course in most of the programmes. Some of them, especially those run in the Latvian language, still face a terminology issue synonymising entrepreneurship with enterprise management. Aaron (like Hannah)

acts as a mentor and advisor to students who are demonstrating commitment and want to become entrepreneurs. The school has just opened a creative business incubator.

The management also favours the further professional development of educators, but when it comes to entrepreneurship, it is extremely hard to involve faculty. Aaron and his EU project team did host various workshops run by “*phenomenal people*”, but “*when you are overworked, not paid a living wage, take home only what you teach, it is very difficult to get the faculty to participate in personal development*”.

Overall, HEI F is making its way towards becoming more entrepreneurial and entering the demand model zone in the “Regulations” dimension, but remains in the supply model zone in the “Financing” dimension.

6.3.3 HEI G: Jack and Dan

HEI G is another large and prominent business school in the Baltics. Founded over two decades ago, it provides a state-of-the-art education in business and economics. Just like the other privately owned schools, it is relatively independent from the state university system, but, unlike other schools, applies the most stringent intake criteria. Applicants are expected to be highly motivated for learning, possess excellent skills in mathematics and the English language. Jack and Dan are among the three entrepreneur-educators responsible for “Lab of Entrepreneurship” (6 ECTS points) that all students attend during the 1st year of bachelor studies. Jack is the lead educator and also teaches “Entrepreneurship” (7.5 ECTS points) in a major that some students select before the 3rd year starts (16 out of 87 students who completed the survey chose this major).

a) Curriculum

Jack and Dan are highly experienced and acting entrepreneurs themselves; however, Jack is the least experienced in pedagogy in the Latvian sample. His motivation in education is based on personal curiosity, self-development, and sharing practical experience with students. Jack has a very critical opinion of how entrepreneurship is taught, yet admits it is easy to criticise, so he exploits any opportunity to do things differently. His main aim is to try out himself in the role of an educator from what he expects to induce interest in entrepreneurship as a career alternative among students as seen in Table 18c. Jack says HEI G tends to produce “*well-trained bankers, finance specialists... they mostly dream about becoming junior assistants at PricewaterhouseCoopers or the like*”, that is why he wants to demonstrate that an alternative career path exists.

Dan aims to increase student motivation to become entrepreneurs while understanding the advantages and risks of this career path as well as to develop the necessary skills. He has an implicit intention to convince them that *“entrepreneurship is a positive behaviour and there are more advantages in starting their own companies than disadvantages”*. Apart from expecting the matching outcomes, Dan also wants the students to become more entrepreneurial in general.

Table 18c. Pedagogical aims set and outcomes expected by Jack and Dan

	Aims set	Outcomes expected
Jack	<i>“Personal curiosity at the start, I have never done it before”</i> .	<i>“Becoming an entrepreneur as a career alternative”</i> .
Dan	<i>“To increase student motivation to become entrepreneurs knowing advantages and possible risks...”</i> <i>“To develop necessary skills to conduct entrepreneurial activities”</i> .	<i>“I expect to get the same results: increased motivation, understanding and abilities/skills”</i> . <i>“Life plan, entrepreneurial personality”</i> .

Drawing upon the course evaluation, Dan could conclude that his students are doing quite well, but looking at the number of companies started he would expect more. Therefore, Dan keeps private venture creation as an objective outcome at the back of his mind. He notices that graduates usually do not start straight after the course but sometime later.

In the formal curriculum, interdisciplinarity is lacking even though it is very important that people with complementary competences cooperate, confirms Jack. The school has recently launched a summer entrepreneurship bootcamp to gather students with different backgrounds from Finland, Estonia and Latvia.

Jack determines how and what he teaches himself. He designed the course from scratch, and was even a bit surprised that the management was not very critical of his work. Jack tends to replicate Blank’s approach in structuring the course content that already touches upon methodological issues. Dan mostly uses textbooks and the experience of other educators in planning the course.

On the whole, the current state of the “Curriculum” dimension in this school indicates the demand teaching model.

b) Methodology

The educators at HEI G are trying to adapt S. Blank’s approach, which enables students to work on their own start-up ideas, test their viability outside classrooms with companies, potential clients, suppliers, etc., and finally pitch them to a panel

of experts. The teaching process starts with lectures about developing their own start-up ideas, guest lectures by practitioners about certain topics, and then the business model development stage commences. As part of business modelling, the students are required to get out of the classroom and test their ideas in the market. Throughout the process the student groups share experiences with their peers. This activity is called “my story – your lesson”.

One more exercise that all the students go through during the first year is a “30 EUR challenge”, which requires maximising an initial investment of 30 EUR in a creative business idea within two weeks. Learning diaries are used on a regular basis as a reflective learning method. However, they are not often read by the educators in detail or acted upon due to the lack of time.

Dan also employs company visits and case studies, mostly local, and he likes preparing his own cases to ensure theory is well-linked with practice. Jack, on the contrary, does not use case studies deliberately, because he finds them “*too superficial*”. He also thinks that the lean start-up approach would better suit engineering than business students; hence, this method is not included into Jack’s practice. Dan has not used business games so far because any new method requires time and effort to be integrated into the curriculum.

The entrepreneurship courses at HEI G are quite compressed lasting 5–8 weeks. Even though the modular system fits the school well, there are some limitations it imposes on combining both theoretical, action and reflective learning components in a balanced manner. On that point, Jack admits the students do not have much reading to do during his courses.

The methodology of EE at HEI G is clearly experiential, corresponding to the competence teaching model.

c) Assessment

Evaluation and grading at HEI G is progress-based. Each student can receive a maximum of 200 points, which are divided among a range of entrepreneurial process-based educational activities students participate in. The minimum number of points required to pass every activity is not made known to the students. This system has received major criticism in the student feedback because they would be willing to put more effort into the activities that carry higher value. The educators’ responses do not indicate that evaluation methods are intended to facilitate learning. The existing system may also keep the students under tension and focus them on getting the points rather than on benefiting from the learning process.

Dan cannot distinguish a particular trend in the students’ progress, since it varies. Jack, in turn, sees a lot of progress. However, he thinks the courses would

benefit from an interdisciplinary team composition because the overall quality of business ideas tends to be “*very lousy*”, lacking substance, yet the business models are “*rather cool*”.

Jack prepared his own feedback survey to find out what should be improved in his major. In one of the questions he asked: “Do you think that your future career will benefit from taking this course?” 16 out of 35 answered definitely, 12 – most probably, 7 – presumably, none – not likely. From Dan’s point of view, it is impossible to satisfy all students, and they do not always know what is better to learn. Therefore, one should omit extremes and find objective points.

HEI G does not adopt any system for measuring EE outcomes, but it has one of the strongest alumni associations in the country that tracks the career paths of all graduates. The school’s management and educators know where the graduates are and how they are doing.

Evaluation practices at HEI G can be positioned in the demand model.

d) Environment

Jack characterises his students as opportunistic and proactive. They are focused, sufficiently involved and responsive to his willingness to involve them. Dan, however, cannot “*draw an average picture*” saying the students are very different. Although formally the school accepts applicants pre-motivated for learning, Dan notices their lack of motivation as the main obstacle. Jack, in turn, brings up obstacles related to the teaching process. His students work in teams of 3–4 each, and as in any group work it has the obvious risk that 1–2 pull the whole team through, while the others have “a piggyback ride”. Jack attempts to tackle this by making every other student report on the project or give a talk.

Similar to other educators in the sample, Dan and Jack bring their own experiences into the classroom by giving examples from life and their practice as entrepreneurs. Jack even received some criticism for not telling them about his personal experiences more often (the interviewer’s note: Jack is a very good speaker and story teller). He always has a back-up plan, if a guest lecturer does not turn up.

Rapport between the educators and the students tends to be very friendly. If students are late to classes, they are entitled “*to buy a little indulgence by telling a joke*”.

The school’s management is very supportive and open to all the new EE initiatives. Jack was stunned by that. From his perspective, they were non-critically accepting of his proposals. HEI G “*is a good example of being a small school that is able to move fast*”.

The local companies are sceptical and not forthcoming when it comes to cooperating with HEIs at all, according to Dan. The school's brand works well to overcome university-industry cooperation barriers because there is a priori respect and acknowledgment of HEI C unlike other schools in the country. The brand and connections are among the cornerstones of the state-of-the-art education declared in the school's mission. Therefore, brand-driven ecosystemic support for educational practice does exist.

The preparation of teaching materials for the courses is split between the educators in charge. They use textbooks and compendiums. Regular updates are self-evident; these can be minor changes in the context or major changes in the course structure. Dan tends to plan more group work for bachelor students because "*it is faster and easier for them to achieve a group dynamic*".

The school did not offer business simulation or similar software at the time (later on "Traction" came in), but video-conferences and video-lectures were practiced.

Both educators are very satisfied with the teaching space and equipment provided, but Dan would not mind new software tools and touch-boards.

In light of these insights, HEI G outperforms the other schools in the "Environment" dimension, and can be located in the demand-competence model.

e) Regulations and financing

Jack refrains from commenting on the policy issues, though he thinks there is an entrepreneurship fostering policy, but no EE policy in the country. Dan says that formally the importance of EE is declared at the policy level, though practically it is non-existent.

Entrepreneurship is a compulsory course for all the school's students in the 1st year of studies, and is an elective course in the 3rd year (when students specialise in marketing, economics, finance or entrepreneurship). Furthermore, HEI G has a number of internal support structures for entrepreneurship, such as its Mentor's Club, Entrepreneurship Support Centre and Centre for Sustainable Business. The former two are action-oriented; the latter is research-oriented. These structures help build the ecosystem and spirit within the school, provide learning opportunities outside the formal curriculum, such as participation in hackathons (e.g. Garage48), bootcamps (e.g. JESS) and incubators (e.g. TechHub Riga).

The educators can avail themselves of the opportunity to improve their expertise 1 or 2 times a year. The institution takes part in several projects related to EE.

Jack and Dan are currently satisfied with the financing. Tuition fees are relatively high. In addition, the school's alumni association helps sponsor various

events, funds top student places and so on. There is a specific allocation for textbooks, foreign lecturers and software.

To sum up, HEI G is ahead in terms of both regulations and financing, even though EE is not a means for income generation, scalability and sustainability. It can be set within the demand model in both dimensions.

6.3.4 HEI H: Patricia and Sander

HEI H is a local traditional university with centuries of history. Patricia takes part in the “Practical Entrepreneurship” (6 ECTS points) course delivered in the 2nd year of bachelor programmes. Sander teaches “Management Theory” (4 ECTS points) in the 1st year. Enterprise management students also do “Management of Enterprise Strategy and Policy” (6 ECTS points), where Patricia is in charge of study seminars. She is also acting head of the Management and Entrepreneurship Study Centre that delivers professional development programmes and courses at HEI H.

a) Curriculum

Sander pursues a rather subjective aim to get as many positive referrals from students as possible. One of the indicators of success as an educator in Sander’s view is also supervising many students’ final theses. Patricia aims to clarify what entrepreneurship is and to help students understand whether they are capable of becoming entrepreneurs. Integrating knowledge into practice, teaching how to set aims and achieving them within the course period was prioritised over stimulation of graduate private entrepreneurial activity considered as a meta-objective. See Table 18d displaying the general aims-outcomes match.

Patricia cannot really assess whether she reaches the outcomes expected, particularly in terms of knowledge, skills and attitudes (“*I understand them as separate notions*”, she says). She is rather interested in integrating her subject into an individual world model of every student. Sander, in his turn, cannot measure whether the first objective is achieved and is gauged by his own feelings. All of the students he keeps contact with do find jobs. Not everyone should be a manager or an entrepreneur, but if graduates start from the lower management levels and develop further from there, this is a satisfactory outcome. In Sander’s view, a manager does not invest his or her own money, yet still implements the entrepreneurial process within a company.

Table 18d. Pedagogical aims set and outcomes expected by Sander and Patricia

	Aims set	Outcomes expected
Sander	- <i>“To get the highest positive referrals from the students; get many subscribed to supervision”</i> .	<i>“So that the objectives were implemented”</i> .
Patricia	- <i>“To clarify what entrepreneurship is; to help an individual understand whether s/he can become an entrepreneur”</i> . - <i>“To integrate knowledge into practice; to teach setting aims and achieving them”</i> . - <i>“Establishment of own enterprise as a meta-objective”</i> .	<i>“Entrepreneurial students and respective abilities”</i> .

There is not much happening at HEI H in terms of interdisciplinarity although it has a lot of potential for that in terms of the diversity of the existing study programme. Sander taught entrepreneurship to biology, sociology and chemistry students, but always separately. Patricia notices that very few experience what it means to work in mixed background teams when they take part in extracurricular business competitions.

Both Sander and Patricia renew the course curricula themselves. In structuring topics, Sander is guided by enterprise management textbooks and his own experience. Patricia and her colleagues try to integrate new knowledge and connections acquired into the official programme on a regular basis. However, she is primarily focused on business games that help students understand their *“own abilities to get further into business”*. According to Patricia’s experience, 50% of graduates will go into standard employment anyway, so that it is natural that a lot of students decide that entrepreneurship is not for them.

HEI H expects to develop entrepreneurial personalities, but this tends to be achieved through exploring personal fit with entrepreneurship using business games. In some instances, the outcome might not be reached because those disappointed in their own ability to become an entrepreneur could also be discouraged from behaving entrepreneurially. HEI H can be diagnosed as being in the supply-demand model, similar to HEI E, in this dimension.

b) Methodology

Patricia starts off testing the capabilities of students in entrepreneurship. Her practice shows that 2% are born entrepreneurs, 30% can be educated into entrepreneurs (but those already motivated, inclined and willing to pursue this path), and the rest are *“under a big question mark”*. Patricia’s extensive experience allows her to diagnose which group a student belongs to with 3 games. Lecturing

accounts for 1/3 of her teaching load, the rest is practice where business games are the most distinct learning activity. Patricia is convinced that the games “*give more energy to accumulate knowledge*” and allow the students to perceive the theory differently: “*an individual has certain points of experience; having undergone one complete business cycle, s/he starts to think and understand why crises happen, what happens with the business, banks, market*”.

Other teaching methods include situation analysis, group work, creativity exercises, some company visits and student research projects. As in HEI E, the learning process is concentrated inside classrooms. Company visits have been quite rare, though some students do have a formal internship as part of their studies. There is no cooperation with science parks or business incubators.

Sander’s teaching is equally divided between theory and practice. His lectures are based on textbook theory, the experience of other enterprises and his own. Sander often refers to video materials about managerial problems. Sometimes practitioners are invited to deliver guest lectures. In seminars, situation analysis is the most important that Sanders either prepares himself or borrows and adapts from the literature. Secondly, group work and discussions, during which students solve given tasks. Thirdly, a course project: whether a new enterprise (on paper, no actual launch) or an enterprise analysis. Students make individual presentations about their chosen topics. Business plans as such are not required, but Sander also employs business games, where the students have to earn or manufacture something.

Summing up, from the methodological viewpoint HEI H can be located in the supply-demand teaching model with a predominantly traditional EE intervention focused on business games.

c) Assessment

At Patricia’s seminars students have to earn points for every activity, “*according to the salary principle*”: “*as in real life, where they have to plan, set priorities, decide, where to invest time, you get what you earn*”. In a group task, students get a certain amount of points per group and should divide them between the group members. Patricia says: “*I can assure you they know better than I how much everyone deserves, and they bear this grading responsibility*”. The question remains whether this approach supports the team spirit, especially considering that the competition among students is high due to the decreasing number of state financed study places.

Sander follows summative assessment principles, where the final grade is composed of solving several activities during the course. He does not use peer assessment because it decreases the level of objectivity.

Patricia thinks that after the crisis the students have become more active so that she often gets students who already have a business idea in their mind and ask her to supervise this coursework.

At the end of every course, the educators gather anonymous feedback from the students. There is no system of measuring EE outcomes, but they get to know if graduates launch new enterprises.

In sum, the “Evaluation” dimension at HEI H is situated in the demand-competence model given Patricia’s methods of self- and group-assessment, despite the evident lack of formative methods common for the demand model.

d) Environment

Students at HEI H are determined and demand quality, prompt lecture starts and study materials. They tend to like team work and practical exercises, but do not favour reading, and tend to be dissatisfied if they do not get enough team work, which surprises Sander. According to Patricia, the students have also developed their understanding of entrepreneurship considerably over the last 10 years.

In regard to the main obstacles to the rapport with the students and to the teaching process, Sander mentions the lack of time because the school is not his main employer. Yet, owing to this, he can teach something the students cannot find in textbooks. Sander is unsure whether he will continue to work as an educator. Patricia, in turn, is concerned about the natural resistance of students that she and her colleagues attempt to tackle through a personal approach during seminars, teaching them how to learn and self-educate. The fun factor in a way also helps overcome the resistance.

In Patricia’s view, the management of HEI H is positive towards EE, while Sander characterises its style as uninvolved. *“Investments are necessary to conduct a good situation analysis... Everyone supports we have to be practical, but no budget is allocated for that”*, he says.

Both educators are satisfied with the working space and available resources. They prepare their own teaching materials or get those that can be obtained free. The school’s library is sufficiently rich with quality textbooks. Patricia would be willing to try out new teaching materials and methods from Estonia, Finland and the Netherlands, yet they would need to be adapted to the local environment.

In general, the study environment at HEI H tends to be standard and traditional, although there is an inclination towards a more interactive and personalised

approach. Again, there are several regulatory and financial constraints that are visible in the educator's responses as addressed below. HEI H can be identified within the supply-demand model zone in this dimension.

e) Regulations and financing

Sander and Patricia are united in the opinion that the state education policy does not pay enough attention to EE. Sander even recognises that there is no interest in entrepreneurship as a field of research or a direction of education; hence, no financing. Usually exact sciences are emphasised with the argument that there are enough graduates with entrepreneurship-related diplomas, without realising that the substance of these diplomas (i.e. the quality of education) is poor. Patricia suggests that the government should improve secondary education first and start integrating entrepreneurship at this level. The changes should also include training teachers.

Entrepreneurship is a compulsory discipline in the faculty of economics and business administration, yet in some programmes it is titled "Enterprise Management". HEI H is just about to open a new business incubator. The centre Patricia leads is focused on delivering educational courses, but it does not exclude individual mentoring should this be required to non-incubated students. The centre is self-financed, and the EU projects help. In general, they have to maintain their own budget and even make pay-offs to HEI H, which holds a stake in the centre's equity.

A distinctive internal regulation in the school is the educators' recruitment policy that requires possession of experience in entrepreneurship.

Relative to HEI E and HEI G, HEI H can be positioned within the supply-demand model in the "Regulations" and "Financing" dimensions.

6.3.5 Prevailing form of intervention

Figure 5 summarises the results of the teaching model diagnostics at Latvian HEIs. HEI G implements the most experiential EE, HEI F follows suit with a predominantly experiential approach lagging behind in the externally influenced dimensions. HEI H implements a predominantly traditional approach, yet with a strong emphasis on business games. Assessing the educators' responses, most of the school's practices correspond to the hybrid supply-demand model. The educators at HEI E employ the most traditional approach in the sample that applies either to the dimensions under the direct influence of the educators themselves or the dimensions influenced by the school (e.g. institutionalisation of EE, internal

investments in entrepreneurship support structures) or external factors (e.g. state education policy, university-industry cooperation level).

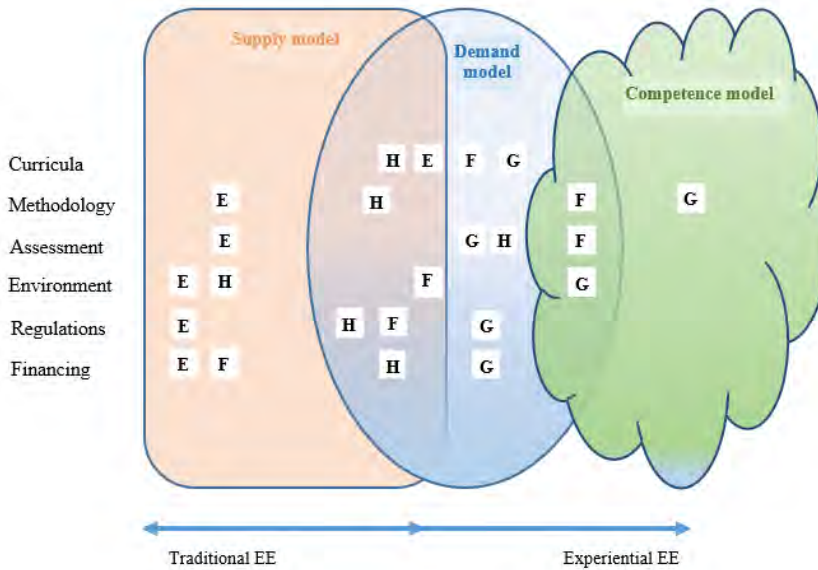


Figure 5. Teaching models at Latvian HEIs by dimension

Other insights from the analysis are summarised in Annex 6.

6.4 Main takeaways

The analysis presented in this chapter demonstrates how the different characteristics of operational dimensions make up the teaching models of 8 EE interventions. This complements the very first empirical evidence on the application of the original teaching models framework by Béchard and Grégoire (2007) and suggests the framework can serve as a useful tool for classifying EE interventions. In our samples, the variation between the supply and competence models is more distinct in Estonia, while in Latvia most of practices can be associated with the demand model and its adjacent hybrids. The demand-competence and competence models are evidently less prevalent in both countries. Simultaneously, we can state how aligned the operational dimensions are within the dominant teaching models and identify several instances of incoherence

between teaching aims, outcomes and methods (Ramsden 2003; Biggs 1999; Prosser and Trigwell 1999). The results of the qualitative study project also add to our knowledge of the state of EE in Estonia and Latvia complementing and updating earlier findings on teaching methods, university-industry cooperation and the curricular status of entrepreneurship from the pan-European studies dating back to 2007–2010 (EC 2010b; EC 2008a; Wilson 2008; Wilson 2007). Finally, the study highlights who the local educators are, and how much experience in pedagogy and entrepreneurship they possess (Fayolle 2013).

In general, the local educators are experienced individuals with already shaped views on how to teach entrepreneurship, and confident in their toolbox of methods. They tend to have practical experience in entrepreneurial activity. However, we can also see entrepreneur-educators with rather limited pedagogical expertise. HEI C, the most experiential in the Estonian sample, recruits educators who have expertise in both entrepreneurship and pedagogy, unlike HEI G in the Latvian sample. Only two of the educators in Estonia (John and Jill) versus four in Latvia (Patricia, Chris, Jack and Dan) do not have a PhD, but this does not mean that all the doctors of science conduct academic research. In addition, the Estonian educators have a more contemporary understanding of the phenomenon focused around process and value creation perspectives. Over the last 5–8 years, entrepreneurship has become better integrated into the curricula of the local business schools despite some terminological issues less pronounced in Estonia than in Latvia (EC 2008a; EC 2008b).

The teaching aims the educators pursue can be classified into three groups: 1) development of an entrepreneurial personality for life in general and, possibly, entrepreneurship at some point in the future (HEIs A, D, G, and H); 2) development of competences for entrepreneurship (HEI C); 3) development of competences for employment after graduation (HEIs B, D, F, and H). Some educators also set the aim to help students establish personal fit with entrepreneurship (or the absence of it), e.g. at HEIs E and H, while others aim to increase one's motivation to pursue a career in entrepreneurship in the first place (HEIs F and G). Notably, the educators do not tend to target objective outcomes explicitly, traditionally focusing on education-level outcomes and expecting them to translate into real life. Only Rob, Leo and Hannah, Chris and Alex emphasised concrete objective outcomes they were aiming for in the Curriculum dimension.

The prevalence of practice-based learning over reflective learning is evident in both countries. Reflections are used only in HEI A, C and G as a method of teaching and/or assessment, but it remains questionable how well 20-year olds can actually reflect on learning experiences (at a meta-competence level). Indicatively, none of

the institutions measure the outcomes of EE on a systematic basis. The educators have an overall positive view of the progress of students and the achievement of outcomes, although this is not supported by the facts and figures. In HEIs C and G, stronger connections with alumni are maintained, but more traditional institutions do not tend to regularly track the career paths of graduates. Confirming the initial contextual data, the local EE does not have a ready infrastructure, which could help educators leverage existing teaching methods. However, three out of four Latvian HEIs are either investing or planning to invest in incubation facilities. University-industry cooperation is gradually being developed, yet in Latvia it is harder to get enterprises involved in cooperation projects.

Mismatches between teaching aims, methods and expected outcomes are encountered in both samples. The main danger behind combining operational elements at odds with one another is the under-achievement of the outcomes regardless of the learning objectives (Bécharad and Grégoire 2005b; Biggs 1999). For example, if an intervention aims to develop entrepreneurial personalities or to motivate towards entrepreneurship as a career choice (the demand model), but uses highly experiential teaching methods corresponding to the competence model (e.g. HEI G) or predominantly traditional methods from the supply model (e.g. HEIs B, E), the likelihood that student learning will suffer is very high. Therefore, the teaching aim would not be achieved. This does not mean, however, that unintended outcomes are not generated, which makes measurement tricky – the target should not be anything the intervention happens to hit as we concluded in Chapter 3.

Operational coherence in teaching is vital for students, educators and researchers. This is particularly true for the curriculum, methodology, assessment and, partly, social environment dimensions that are under the direct control of the educators. Talking about multi-level coherence, we see that the Estonian HEIs are well-aligned in the first three internal dimensions with the slight exception of HEI B, while we also notice mismatches in Latvian HEIs E and G. The positions of HEIs A, C, F, G and, to an extent, E could be better matched between the external and internal dimensions. Finally, some mismatches are noticeable between the external dimensions of regulations and financing in the case of HEIs A and F. All the dimensions taken together, traditional HEIs B, D, E, and H were well-aligned within the supply and supply-demand model area.

Although the HEIs' management attitude towards EE is positive, many educators feel the lack of funding for teaching, physical environment and professional development. EE financing is highly dependent on EU projects. HEIs C and G, where entrepreneurship is taught experientially, can afford higher salaries for the educators and the maintenance of internal entrepreneurship support

structures. Despite the major difference between Latvia and Estonia in prioritisation EE in the state education policy, funding remains an issue in most of the local HEIs.

Overall, there are more similarities than differences in the analysed dimensions, albeit with some regulatory exceptions. This suggests the findings are transferrable between countries with a similar context, even though Estonia slightly outperforms Latvia in the level of economic development. Annex 7 outlines the main dimensional findings in a comparative perspective.

How conscious are the educators of pursuing a certain teaching model? On the whole, the terms they operated with when answering the questions did not signal any active awareness about the implications of the learning paradigms for teaching in general and entrepreneurship in particular, and the impact different modes of teaching should have on the outcomes of EE. HEIs A, C, F and G appeared more ontologically grounded despite the educators not referring to any of the related terms such as paradigms, theories or concepts; yet, they showed a strong belief that the experiential approach should work better. Simultaneously, learners' conceptions and preferences towards either traditional or experiential learning were not taken into account explicitly. According to Rob and Chris, the students nowadays are less willing to read and concentrate, at the same time being accustomed to the right-wrong approach and predominantly traditional learning as a legacy of their secondary education.

The diagnostics performed here are based on subjective interpretations of the interview data as is natural for a qualitative analysis. In a way, divergent forces have been registered that bring the analysed HEIs either to the one or another end of the spectrum between supply and competence models. To tackle the subjectivity, four interviews (with John, Jill, Leo and Patricia), that were used in both the CB Entreint and the current project, were double coded at two different points in time – September 2013 and November 2015 – thus enabling a coding comparison query in NVivo. The comparison of the “Curriculum”, “Methodology”, and “Assessment” dimensions indicates a percentage agreement in coding ranges from 98% to 100%⁵. Therefore, the Kappa coefficient (K) is always above 0.75, which should be interpreted as “excellent agreement”. In addition, one senior researcher contributed to strengthening the dependability and confirmability criteria of the research quality by assessing the author's inferences from expert interviews and the justification of classifying EE in the surveyed HEIs into traditional and experiential forms of intervention. The senior researcher concluded that “*the author*

⁵ It is calculated as the number of units (i.e. references) of agreement divided by the total units of measure within the data item (i.e. certain node).

offers enough evidence and reasoning why certain institutions are classified the way they are". Nevertheless, some limitations of the qualitative study project should be acknowledged. They are discussed in Chapter 8.

The association of the prevailing forms of intervention with different learning outcomes is one of the principal concerns and contributions of the thesis. The highlighted comparative insights from the qualitative study project will be referred to in more detail further on when interpreting and discussing the quantitative data patterns.

7 QUANTITATIVE DATA ANALYSIS AND RESULTS

The quantitative data analysis began with data merging and cleansing, cross-checking, re-coding, and verification. Preparatory works included the inspection of the uncompleted questionnaires and missing or unusable observations, validation of sampling and response rates for non-response and self-selection biases, matching the comparison groups (in the original grouping of HEIs and by intervention type) on a set of descriptive and control characteristics. They also included the evaluation of reliability, examination of the data structure and checking whether it meets the main assumptions required for the chosen statistical methods. The preparatory works are presented in Annex 8. Non-entrepreneurship graduates in both samples are excluded from the testing of the hypotheses, which narrows the number of observations down to 211 in the Estonian sample and to 306 in the Latvian sample. This chapter covers the results of cross-checking the prevailing form of intervention in the surveyed HEIs, estimating the learning and the objective outcomes of EE and, most importantly, the results of testing the research hypotheses.

7.1 Cross-checking the prevailing form of intervention

Prior to running the statistical tests, the prevailing form of intervention at each HEI was cross-checked by assessing the frequency of the respondents' exposure to traditional and experiential learning activities. This assessment confirmed the principal conclusions drawn from the interviews. In the Estonian sample, HEI C stands out as the most experiential followed by the more traditional HEIs B, A, and finally D. Respondents from HEI B were even slightly more frequently exposed to experiential learning than their counterparts from HEI A. As a reubder, according to the interpretation of the interview data, HEI A was supposed to be closer to the demand model than HEI B. A similar issue arises when comparing the corresponding information about the Latvian HEIs E and H. In this sample, EE interventions were clearly more experiential in HEIs G and F compared to HEIs E and H, while HEI E, in turn, employed more experiential teaching methods than

HEI H. This factual data hints that either Patricia (and Sander) from HEI H could have exaggerated their educational efforts or Chris (and Sarah) from HEI E slightly underestimated their efforts. EE in HEI G, in turn, proves to be the most experiential. See Tables 19a and 19b for details (the highest frequencies shown in bold).

Table 19a. Frequencies of exposure to different teaching methods in the Estonian sample

Methods/HEI	A (n=73)		B (n=25)		C (n=37)		D (n=76)	
I. Traditional methods								
<i>lectures</i>	71	97.2%	23	92.0%	36	97.3%	75	98.7%
<i>discussions</i>	44	60.3%	13	52.0%	23	62.2%	36	47.4%
<i>case studies</i>	48	65.8%	15	60.0%	29	78.4%	31	40.8%
<i>business planning*</i>	36	49.3%	9	36.0%	25	67.6%	35	46.1%
II. Methods based on working life								
<i>real-life problem solving</i>	24	32.9%	4	16.0%	15	40.5%	14	18.4%
<i>internships (practice at work)</i>	31	42.5%	8	32.0%	15	40.5%	53	69.7%
<i>real-life projects with companies</i>	12	16.4%	4	16.0%	2	5.4%	4	5.3%
<i>working with mentors</i>	4	5.5%	0	0.0%	8	21.6%	3	3.9%
<i>guest lectures by practitioners</i>	39	53.4%	17	68.0%	10	27.0%	8	10.5%
<i>job shadowing</i>	2	2.7%	2	8.0%	2	5.4%	3	3.9%
III. Methods modelling entrepreneurship								
<i>24-h camps (e.g. Garage 48)</i>	2	2.7%	1	4.0%	0	0.0%	0	0.0%
<i>mini-companies</i>	1	1.4%	2	8.0%	6	16.2%	1	1.3%
<i>virtual mini-companies</i>	1	1.4%	2	8.0%	4	10.8%	0	0.0%
<i>pre-incubation and incubation</i>	0	0.0%	0	0.0%	13	35.1%	1	1.3%
<i>simulations</i>	5	6.8%	7	28.0%	10	27.0%	8	10.5%
<i>business games</i>	7	9.6%	7	28.0%	20	54.1%	30	39.5%
<i>business modelling</i>	11	15.1%	4	16.0%	9	24.3%	6	7.9%
<i>pitching business ideas</i>	22	30.1%	15	60.0%	23	62.2%	17	22.4%
<i>business competitions</i>	1	1.4%	2	8.0%	3	8.1%	1	1.3%
<i>entrepreneurship labs</i>	0	0.0%	0	0.0%	2	5.4%	0	0.0%
IV. Participative methods								
<i>international exchange programs</i>	1	1.4%	2	8.0%	2	5.4%	1	1.3%
<i>creativity exercises</i>	12	16.4%	6	24.0%	12	32.4%	19	25.0%
<i>fishbowls</i>	14	19.2%	4	16.0%	10	27.0%	12	15.8%
<i>scientific discussions</i>	7	9.6%	1	4.0%	4	10.8%	4	5.3%

Teaching methods based on working life, such as real-life problem solving, pitching business ideas to investors, real-life projects with companies, among others, occurred evidently more often in HEIs C and G. Such methods that modelled entrepreneurship via the creation of mini-companies, incubation, business modelling, business competitions and entrepreneurship labs were also the most frequent in HEI G. In this group, HEI F leads with virtual mini-companies, simulations, business games as well as 24-hr camps. Internships were most frequent

in HEIs D and E due to the fact that officially the schools focus on professional education, and practice at work is a compulsory, albeit very formal, part of a bachelor degree. Overall, the frequencies vary across the schools. As anticipated, there are elements of both traditional and experiential EE in each school.

Table 19b. Frequencies of exposure to different teaching methods in the Latvian sample

Methods/HEI	E (n=60)		F (n=123)		G (n=87)		H (n=36)	
I. Traditional methods								
<i>lectures</i>	58	96.7%	113	91.9%	85	97.7%	36	100.0%
<i>discussions</i>	49	81.7%	81	65.9%	63	72.4%	24	66.7%
<i>case studies</i>	27	45.0%	70	56.9%	65	74.7%	10	27.8%
<i>business planning*</i>	37	61.7%	54	43.9%	55	63.2%	9	25.0%
II. Methods based on working life								
<i>real-life problem solving</i>	15	25.0%	58	47.2%	57	65.5%	8	22.2%
<i>internships (practice at work)</i>	38	63.3%	63	51.2%	31	35.6%	5	13.9%
<i>real-life projects with companies</i>	4	6.7%	30	24.4%	49	56.3%	2	5.6%
<i>working with mentors</i>	2	3.3%	7	5.7%	16	18.4%	2	5.6%
<i>guest lectures by practitioners</i>	27	45.0%	45	36.6%	67	77.0%	9	25.0%
<i>job shadowing</i>	8	13.3%	7	5.7%	23	26.4%	1	2.8%
III. Methods modelling entrepreneurship								
<i>24-h camps (e.g. Garage 48)</i>	1	1.7%	4	3.3%	1	1.1%	0	0.0%
<i>mini-companies</i>	5	8.3%	6	4.9%	45	51.7%	4	11.1%
<i>virtual mini-companies</i>	7	11.7%	26	21.1%	2	2.3%	5	13.9%
<i>pre-incubation and incubation</i>	4	6.7%	9	7.3%	9	10.3%	0	0.0%
<i>simulations</i>	13	21.7%	47	38.2%	26	29.9%	6	16.7%
<i>business games</i>	24	40.0%	71	57.7%	21	24.1%	15	41.7%
<i>business modelling</i>	21	35.0%	31	25.2%	33	37.9%	5	13.9%
<i>pitching business ideas</i>	14	23.3%	34	27.6%	34	39.1%	7	19.4%
<i>business competitions</i>	6	10.0%	20	16.3%	31	35.6%	0	0.0%
<i>entrepreneurship labs</i>	2	3.3%	3	2.4%	16	18.4%	1	2.8%
IV. Participative methods								
<i>international exchange programs</i>	10	16.7%	13	10.6%	10	11.5%	4	11.1%
<i>creativity exercises</i>	21	35.0%	55	44.7%	32	36.8%	15	41.7%
<i>fishbowls</i>	5	8.3%	12	9.8%	1	1.1%	3	8.3%
<i>scientific discussions</i>	10	16.7%	15	12.2%	5	5.7%	3	8.3%

*Whilst the treatment of business planning as a traditional method might be disputable, it is commonly delivered in a traditional way in the local higher education institutions. Most often, it is an individual or pair assignment requiring submission of a 10–15 page document comprising mission statement, product or service description, market and SWOT analysis, and cash flow forecast, among other standard components.

7.2 Estimation of EE outcomes

7.2.1 Learning outcomes

Table 20 shows the results of the confirmatory factor analysis (CFA) performed as the first stage of the SEM, during which the constructs of perceived learning outcomes were estimated. Following the purification of items with low standardised regression weights (under 0.65), which did not represent the latent variables well enough, the constructs of cognitive outcomes and skill-based outcomes consisted of 7 and 11 items, respectively. In the case of the affective outcomes, only 6 items in the Latvian and 7 items in the Estonian sample out of 26 in total made up the construct that can be entitled “affection for entrepreneurship”. Elimination of over a half of the items in the estimation process, including those conceptually inherent in entrepreneurship – for example, attitude to risk and failure, self-reliance in the face of uncertainty, encouraged the author to explore the multidimensional structure of the data in more detail with the principal component analysis (PCA) in SPSS. In comparison to SEM, the reliability threshold for PCA-based multi-item variables is lower than 0.85–0.9 (Hair et al. 2010; Nardo et al. 2005). Therefore, it could potentially enrich the analysis with a wider range of affective outcomes. The measurement approach changed its nature from the reflective to the formative at this point.

All three constructs exhibited very good model fit indices (e.g. Hair et al. 2010; Hooper et al. 2008), including chi-square/degrees of freedom ($\chi^2/d.f.$) (between 1.8 and acceptable 2.6), goodness-of-fit index (GFI>0.9), normed fit index (NFI>0.9), comparative fit index (CFI>0.95), and root-mean-square error of approximation ($0.06 < RMSEA < 0.07$).

The sufficiently high validity indicators (AVE) confirmed that the variables resulting from the purification process measure the respective latent constructs, while the latter are able to explain over 50% of the variance in the observed variables (Farrell and Rudd 2009). The composite reliability indicator (ρ) showed that the observed items belonging to one construct are highly inter-related to each other. This indicator, analogous to Cronbach’s alpha, is a preferred alternative as a more stringent measure of reliability (Fornell and Larcker 1981). Dimension reduction with the same pool of items using the PCA in SPSS brought about three identical components. Factor scores of each outcome were then elaborated and saved as variables for testing the hypotheses (Paas and Halapuu 2012).

Table 20. Results of the CFA for the learning outcome constructs

Scale properties and items (All items measured with five-point Likert scales)	Indicators standardised loadings	
	Latvia (LV)	Estonia (EST)
Cognitive outcomes/Knowledge about entrepreneurship, 7 items: LV: AVE=0.507, ρ =0.878; EST: AVE=0.543, ρ =0.892 Fit indexes LV: $\chi^2=31.029$, d.f.=13, $p<0.003$, $\chi^2/d.f.=2.387$, GFI=0.972, NFI=0.967, CFI=0.980, RMSEA=0.067 Fit indexes EST: $\chi^2=25.894$, d.f.=14, $p<0.027$, $\chi^2/d.f.=1.850$, GFI=0.970, NFI=0.965, CFI=0.983, RMSEA=0.064		
• development of new products and services (Izquierdo 2008)	0.770	0.715
• opportunity recognition (Izquierdo 2008)	0.751	0.835
• business modelling (Lorz 2011)	0.725	0.738
• evaluation of business opportunities (Izquierdo 2008)	0.678	0.801
• team management (Lorz 2011)	0.705	-
• positioning and branding of products and services (Fisher et al. 2008)	0.691	-
• project management (Fisher et al. 2008)	0.656	-
• attraction of financing (Lorz 2011)	-	0.753
• lean start-ups (Lorz 2011)	-	0.713
• business communication (Fisher et al. 2008)	-	0.578
Skill-based outcomes/Entrepreneurial skills, 11 items: LV: AVE=0.584, ρ =0.939; EST: AVE=0.602, ρ =0.943 Fit indexes LV: $\chi^2=102.819$, d.f.=41, $p<0.000$, $\chi^2/d.f.=2.508$, GFI=0.942, NFI=0.954, CFI=0.972, RMSEA=0.070 Fit indexes EST: $\chi^2=88.121$, d.f.=42, $p<0.000$, $\chi^2/d.f.=2.098$, GFI=0.930, NFI=0.949, CFI=0.972, RMSEA=0.072		
• organise and control on-going projects (Gibcus et al. 2012)	0.821	0.821
• solve creative business problems (Gibb 2005)	0.789	0.827
• be a valuable team-member (Fisher et al. 2008)	0.777	-
• build up professional networks (Gibcus et al. 2012)	-	0.837
• lead a team (Fisher et al. 2008)	0.781	0.694
• set priorities and focus on realistic goals (Fisher et al. 2008)	0.773	0.834
• keep good interpersonal relations (Izquierdo 2008)	0.781	0.720
• resolve conflicts (Fisher et al. 2008)	0.746	0.674
• develop innovative working environment (De Noble et al. 1999)	0.738	0.772
• negotiate deals with other businesses (Gibb 2005)	0.738	0.837
• deal with uncertainty, adapt to new and uncertain situations (Fisher et al. 2008)	0.738	0.714
• identify unmet needs of people (De Noble et al. 1999)	0.720	0.778

Affection for entrepreneurship, 6-7 items: LV: AVE=0.650, ρ =0.917; EST: AVE=0.683, ρ =0.937 Fit indexes LV: χ^2 =19.876, d.f.=8, p <0.011, χ^2 /d.f.=2.484, GFI=0.978, NFI=0.985, CFI=0.991, RMSEA=0.070 Fit indexes EST: χ^2 =23.985, d.f.=12, p <0.020, χ^2 /d.f.=1.999, GFI=0.970, NFI=0.980, CFI=0.990, RMSEA=0.069		
• To be an entrepreneur and have own company is my true passion (Lorz 2011)	0.926	0.865
• A career as an entrepreneur suits me well – it gives me freedom and autonomy (Lorz 2011)	0.852	0.856
• My professional goal is to be an entrepreneur (Gibcus et al. 2012)	0.841	0.879
• Among various options, I would rather be an entrepreneur (Gibcus et al. 2012)	0.802	0.859
• I want to start a (one more) new enterprise (Fisher et al. 2008)	0.720	0.767
• I am confident in my ability to start an enterprise (Fisher et al. 2008)	0.669	0.684
• I will make every effort to start a new enterprise (Lorz 2011)	-	0.857

As a result of the estimation performed, half of the cognitive learning items borrowed from the original study by Fisher et al. (2008) were eliminated. Notably, the final construct differed in the Latvian and Estonian samples. The former included three management/marketing-related items – “project management”, “team management”, “positioning and branding of products and services”, while the latter retained entrepreneurship-related “attraction of financing”, “lean start-ups” and “business communication” instead. Therefore, the data reflected differences in the teaching content as well as the understanding of the distinction between entrepreneurship and management in the Latvian academic circles, which was still transitioning.

The second construct of skill-based outcomes largely entailed more interpersonal than business-specific skills; for example, “lead a team”, “resolve conflicts”, “identify unmet needs of people”, although “organisation and control of on-going projects” and “negotiate deals with other businesses” had the highest standardised loading, respectively, in the Latvian and Estonian samples. Such items as “attracting investors to entrepreneurial endeavours”, “identifying and analysing risk”, “devising business models” and “developing new products and services” (Lorz 2011; Fisher et al. 2008; Izquierdo 2008), directly relating to the entrepreneurship process, appeared to have low loadings; that is, did not represent the latent skill-based outcomes construct well enough, and so were eliminated. This time, there were no major differences between the samples.

The construct denoting the first and main part of the affective outcomes consisted of the items that represent a high degree of affection for entrepreneurship – career aspirations, desirability to start-up, passion for entrepreneurship and self-efficacy. “I will make every effort to start a new enterprise” can also be interpreted as related to intent aside of affect. The factor analysis of the initial set of 26 items meant to measure the affective outcomes resulted in 6 components that were reached in 3 consecutive rounds of dimension reduction. All the variables had at least one correlation above 0.3, and therefore were valid for including in the analysis. The presence of correlations and the possibility to reduce the data to a smaller number of components was confirmed by the Barlett’s test of sphericity. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was above 0.8 in both samples, meaning that there were linear relationships between the variables. Hence, PCA was a suitable method. Due to low loadings (<0.5) that would affect Cronbach’s alpha, three items in each sample were eliminated. First, “I am sure I can be a good leader of a team” in both samples; second “For me, failure is a valuable outcome of the process of doing” and third “At any work I prefer to lead key processes myself” in the Estonian sample; and “I feel self-confident when

talking to successful entrepreneurs” and “I always try to find innovative solutions to arising or existing challenges” in the Latvian sample.

The very first component mirrored the composition of the “affection for entrepreneurship” construct and explained 6.9 eigenvalues of variance, or 30%, in the Latvian dataset, and 8.8 eigenvalues, or 38%, in the Estonian dataset. The slight difference with the SEM construct, which is more demanding in terms of loadings that affect AVE, was accepted in the Latvian sample, where the 7th item, “I will make every effort to start a new enterprise”, also loaded into this component (0.649). The Chronbach’s alpha for the sub-scale amounted to 0.917 (for 6 items, 0.918) in Latvia and 0.937 in Estonia (identical to Rho-s in AMOS). The other five components that explained 35.1% more variance in the Latvian data and 32.7% in the Estonian data were very similar. In this case, the statistical treatment of the data was close enough to conceptual, so that it was possible to label the components and treat them as subscales. The five extra components of the affective outcomes identified were: creative attitude and self-confidence (6-7 items), need for achievement/ambitiousness (3 items), attitude to new learning (2 items), sense of self-reliance (2 items), and attitude to risk and failure (2-3 items). Their Cronbach’s alphas ranged from acceptable 0.61 to very good 0.86. See Table 21.

Hereafter methodological procedures stipulated in the OCED handbook on composite indicators were complied with (Nardo et al. 2005). Following the examination of the data structure, three basic steps were undertaken: the normalisation, weighting and aggregation of variables.

Although the related variables had similar measurement units (5-point Likert scale), the data was normalised using standardisation (or z-scores) as the most common approach, also for the sake of further comparisons with the prior competence levels. Quite often, composite indicators rely on equal weighting, when all variables are given equal weights. Yet, it seems more reasonable to reflect the contribution of every indicator in the composite based on the variance explained through the PCA. This corrects for possible overlapping information of two or more highly correlated items and makes the composite more balanced (so that the number of variables per sub-component does not increase its weight).

The PCA-based weights were calculated from the matrix of factor loadings after rotation. All the loadings were squared which represented the proportion of the total unit variance of each item explained by the factor (i.e. component). Then the squared loadings of the six components were summed up and the proportion of the variance each component explained in the dataset was computed. Items with the highest factor loadings were grouped into intermediate composites. The weights of its items were calculated by dividing the squared loading with the total variance the

respective component explained. Finally, the intermediate composites were linearly aggregated by weighting each composite with the share of variance it explained in the dataset. In this way, the composite indicator of the affective outcomes was obtained. Annex 9 illustrates the steps in this process in more detail showing the sample calculation for the Estonian dataset. The extra five multi-item components were also saved as separate variables to be referred to in hypothesis testing (H1, in particular) (Paas and Halapuu 2012). Alternatively, one could create respective composites based on the amount of variance each constituting item explains, yet the automated elaboration of factor scores was a preferred option over the manual creation of these variables in SPSS (although the output of both generated similar results).

Table 21. Cronbach's alphas for the affective outcome subscales

Sub-scale/alpha	Latvia	Estonia
1. Affection for entrepreneurship (7-item as per Table 27)	0.917	0.937
2. Creative attitude and self-confidence <i>- I perceive myself as a creative person.</i> <i>- I am enthusiastic about generating new ideas and recognising new opportunities.</i> <i>- I am always trying to be alert to new ideas and opportunities that come to my mind.</i> <i>- I openly question how things can be improved.</i> <i>- I always make my best effort to convince other people in my ideas.</i> <i>- At any work I prefer to lead key processes myself. (only LV)</i> <i>- I always try to find innovative solutions to arising or existing challenges. (only EST)</i> <i>- I feel self-confident when talk to successful entrepreneurs. (only EST)</i>	0.766	0.857
3. Need for achievement/ambitiousness <i>- Usually I set ambitious goals to myself.</i> <i>- I want to achieve more than most other people.</i> <i>- It is vital for me to grow and develop constantly.</i>	0.764	0.766
4. Attitude to new learning <i>- I am keen on new learning.</i> <i>- I appreciate professional guidance from more experienced people.</i>	0.656	0.780
5. Sense of self-reliance <i>- I can rely on myself in any demanding situation.</i> <i>- I can rely on myself in any uncertain situation.</i>	0.746	0.663
6. Attitude to risk and failure <i>- I like taking business risks – it excites me!</i> <i>- I tend to take my chances, even if I might fail.</i> <i>- For me, failure is a valuable outcome of the process of doing. (only LV)</i>	0.611	0.791

7.2.2 Objective outcomes

Among the objective outcomes of interest to the study, employability and nascent intrapreneurship II (involvement in idea development and implementation phases) demanded special attention to be estimated, particularly the former given no ready scales. Private early-stage entrepreneurial activity (EA) and nascent intrapreneurship I were classically constructed as binary variables (see Chapter 5, section 5.4.2).

The reliability coefficient of the nascent intrapreneurship II scale accounted for 0.824 in Estonia and 0.787 in Latvia. It comprised 4 variables – active participation in idea development phase and implementation phase, and taking an active or supporting role in these phases. According to the questionnaire logic, the related questions were asked to those individuals, who had either been involved in the nascent intrapreneurial activity at the time of the survey or had been involved in the past (the latter is controlled for in the regressions). There were 43 and 88 relevant observations in the Estonian and Latvian samples, respectively. Factor scores for the aggregated measure were elaborated using the PCA procedure in SPSS (ibid 2012). Tables 22a–c outline the descriptive statistics and correlations for the scale items. The items are highly and significantly inter-correlated in both samples.

The initial version of employability that comprised nine items had quite low alphas (0.591 in Estonia and 0.569 in Latvia). “Satisfaction with income” was not included in the composite on purpose, because over 50% of the respondents were either dissatisfied or neutral about their income, which is explicable with their relative youth (the mean age was 25 in Latvia and 28 in Estonia). The PCA suggested that “the number of employers worked for” brought the reliability coefficient below the threshold of 0.6 (Hair et al. 2010). Following the elimination of this item, the alphas of the testable 8-item scale rose to 0.649 and 0.633 (not ideal but acceptable). However, the coefficient was not an indication of the unidimensionality of the measure (Nardo et al. 2005), and the statistical treatment of the data differed from conceptual. For this reason, equal weighting and linear aggregation were applied to the eight standardised items to construct a composite indicator. Hence, the theoretical treatment of the data was given preference, albeit acknowledging this as a measurement (de)limitation. Standardisation (or z-scores) was exactly suitable as the method of data normalisation, because it allowed indicators with extreme values to have a greater effect on the composite, i.e. more exceptional behaviour was rewarded (ibid 2005). In order to double check the regression results, an alternative version of the composite was created consisting

of three sub-components with the PCA-based weights (the procedure analogous to the one presented in Annex 9). There were 157 relevant observations in the Estonian sample and 236 in the Latvian sample for this dependent variable.

Tables 22a–c. Descriptive and correlation matrixes for the nascent intrapreneurship II items

a) <i>Items (original, non-Z)</i>	<i>Estonian sample</i>					<i>Latvian sample</i>				
	N	Min	Max	Mean	SD	N	Min	Max	Mean	SD
Active participation in ideation	43	0.00	1.00	0.79	0.41	88	0.00	1.00	0.82	0.39
Active participation in implementation	43	0.00	1.00	0.70	0.46	88	0.00	1.00	0.66	0.48
Role in ideation	43	0.00	2.00	1.28	0.65	88	0.00	2.00	1.18	0.62
Role in implementation	43	0.00	2.00	1.12	0.83	88	0.00	2.00	1.08	0.72
Valid N (listwise)	43					88				
Cronbach's alpha			0.824					0.787		

b)	<i>Estonian sample</i>	1	2	3	4
1	Active participation in ideation	1			
2	Active participation in implementation	0.387**	1		
3	Role in ideation	0.456**	0.491**	1	
4	Role in implementation	0.388**	0.811**	0.701**	1

** . Correlation is significant at the 0.01 level (2-tailed).

c)	<i>Latvian sample</i>	1	2	3	4
1	Active participation in ideation	1			
2	Active participation in implementation	0.353**	1		
3	Role in ideation	0.554**	0.333**	1	
4	Role in implementation	0.383**	0.695**	0.561**	1

** . Correlation is significant at the 0.01 level (2-tailed).

Descriptive statistics and correlations of the variables constituting the employability composite are presented in Tables 23a–c.

In the Estonian sample, “Time span for finding a job” was the only item that had no significant correlations with other constituents. This could be treated as an indication of bringing the reliability coefficient down. However, the elimination of the item would result in a small increase of the alpha to 0.671, and in addition would make the composition of the measure different from the Latvian sample, where it did positively correlate with the “degree of influence in decision-making” and “promotion to higher positions” at a statistically significant level.

Tables 23a–c. Descriptive and correlation tables for the employability items

a) Items (original, non-Z)	Estonian sample					Latvian sample				
	N	Min	Max	Mean	SD	N	Min	Max	Mean	SD
Satisfaction with the work content	159	1	5	3.64	1.01	242	1	5	3.62	0.98
Degree of influence in decision-making	159	1	5	3.36	0.93	242	1	5	3.03	0.93
Promotion to higher positions	158	0.00	1.00	0.63	0.49	239	0.00	1.00	0.62	0.49
New ideas in everyday job	159	2.00	5.00	3.87	0.76	242	1.00	5.00	3.85	0.82
Share of content control at work	159	1.00	5.00	3.53	1.34	242	1.00	5.00	3.29	1.31
Number of managerial positions undertaken	158	0.00	2.00	0.85	0.78	239	0.00	2.00	0.64	0.75
Significant activity at work initiated by oneself or others	159	0.00	3.00	1.52	0.99	242	0.00	3.00	1.65	0.96
Time span for finding a job	158	1.00	6.00	5.06	1.01	239	1.00	6.00	4.95	0.95
Valid N (listwise)	157					236				
Cronbach's alpha	0.649					0.633				

b)	Estonian sample	1	2	3	4	5	6	7	8
1	Satisfaction with the work content	1							
2	Degree of influence in decision-making	0.238**	1						
3	Promotion to higher positions	0.221**	0.286**	1					
4	New ideas in everyday job	-0.021	0.383**	0.228**	1				
5	Share of content control at work	0.184*	0.470**	0.246**	0.264**	1			
6	Number of managerial positions undertaken	0.077	0.384**	0.173*	0.291**	0.172*	1		
7	Significant activity at work initiated by oneself or others	0.130	0.221**	0.325**	0.211**	0.222**	0.031	1	
8	Time span for finding a job	0.102	0.104	0.113	0.044	0.031	0.109	-0.014	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

c)	<i>Latvian sample</i>	1	2	3	4	5	6	7	8
1	Satisfaction with the work content	1							
2	Degree of influence in decision-making	0.320**	1						
3	Promotion to higher positions	0.215**	0.186**	1					
4	New ideas in everyday job	0.151*	0.267**	0.166*	1				
5	Share of content control at work	0.238**	0.426**	0.150*	0.072	1			
6	Number of managerial positions undertaken	0.164*	0.339**	0.289**	0.171**	0.245**	1		
7	Significant activity at work initiated by oneself or others	0.084	0.250**	0.121	0.249**	0.160*	0.062	1	
8	Time span for finding a job	0.045	0.170**	0.146*	0.097	0.094	0.108	0.085	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

7.3 Testing the hypothesized linkages and drawing inferences

7.3.1 Correlation between the learning outcome types: testing H1a-H1c

Bivariate correlations between the pairs of cognitive, skill-based and affective outcome composites were all highly significant as well as exceeding 0.3 in the Estonian sample. Therefore, hypotheses H1a, H1b and H1c can be strongly supported in this sample. Bearing in mind that the composition of the cognitive outcome construct notably differed in Estonia and Latvia, the differences revealed in the correlation coefficients are explicable. As shown in Figure 6, the correlational link between cognitive and affective outcomes in the Latvian sample was the weakest though also significant ($r=0.124$, $p<0.05$).

The other two coefficients were high enough to support H1a and H1b. In principle, H1c could also find full support in the Latvian sample, if the detailed examination of the composites did not suggest that cognitive outcomes significantly correlated only with the attitude to risk and failure ($r=0.192$, $p<0.05$), but not with affection for entrepreneurship or any other multi-item measure of affective outcomes. To compare, in the Estonian sample, all the measures were positively inter-correlated. Therefore, on this comparative basis H1c got partial support in Latvia. As for H1b, it was not supported *strongly*, because the

connection of the skill-based outcomes with the need for achievement and attitude to new learning was non-significant (see Annex 10 for details).

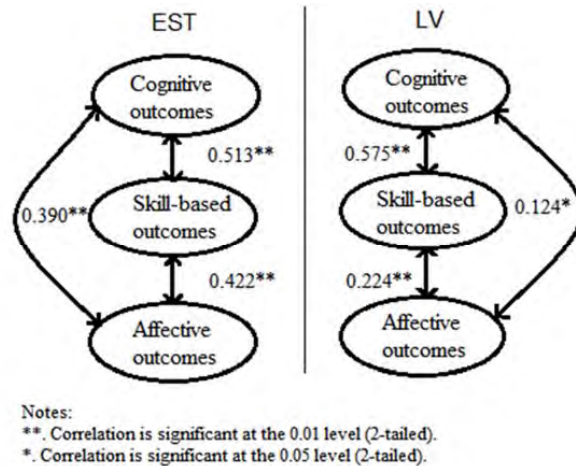


Figure 6. Correlation between the learning outcome types in Estonia and Latvia

In the study by Fisher et al. (2008), entrepreneurial spirit associated with the positive affect and excitement to start-up, taking risks, being creative, was also insignificantly related to the cognitive learning composite. Hence, the result from the Latvian sample confirmed the findings of this very first study that applied the tripartite learning outcomes framework to EE. Simultaneously, the slight differences between the two samples demonstrate how variations in study programme design and delivery can influence the strength and significance of the associations.

7.3.2 Mediation between cognitive and affective outcomes: testing H2

The second hypothesis was tested both in AMOS, by constructing the structural model at the second stage of SEM, and in SPSS, by running a stepwise mediation regression. The reason behind applying the two methods was: a) to establish whether mediation held between the cognitive outcomes and the affection for entrepreneurship that explained nearly half of the cumulative variance in the Latvian data and over half in the Estonian data on the affective outcomes; and b) to establish whether mediation held between the cognitive and affective outcomes

(the latter comprising the subscales of affective outcomes), while taking into account control variables previous research had shown to be important.

In the first stage of SEM, the convergent validity of the tripartite framework was achieved. Prior to proceeding to the second stage in AMOS to test the structural model, the discriminant validity test was performed to back up the modelling results. This test indicated that the latent variables were able to account for more variance in the observed variables (items) than the measurement error or other constructs within the conceptual model (Farrell and Rudd 2009). As Table 24 shows, the squared correlation estimates (e.g. Cognitive<->Skill-based, 32.9%) were lower than the AVE of each of the learning outcome constructs (e.g. Skill-based, 58.4%; Cognitive, 50.7%); hence, the discriminant validity was established. The lowest AVEs of the constructs for each pair of the outcomes are displayed.

Table 24. The discriminant validity test

r*	<i>Correlation</i>		<i>Squared correlation</i>		<i>AVE</i>	
	Estonia	Latvia	Estonia	Latvia	Estonia	Latvia
C <-> S	0.513	0.575	0.263	0.331	0.543 (C)	0.507 (C)
S <-> A	0.340	0.134	0.116	0.018	0.602 (S)	0.584 (S)
A <-> C	0.377	0.079	0.142	0.006	0.543 (C)	0.507 (C)

*Notes: C – cognitive outcomes construct, S – skill-based outcomes construct, A – affection for entrepreneurship construct

The results of the second stage of SEM, the construction of the structural model (that consisted of the estimated constructs), which tested the mediated relationship between the knowledge and affection-outcomes, are outlined in Figure 7.

The structural model demonstrated excellent fit indicators in both countries and suggested H2 can be supported (see Annex 11). With skill-based outcomes introduced to the model in the Latvian sample, the influence of cognitive outcomes on the affection for entrepreneurship was insignificant, and the direct effect even became negative. Consequently, mediation was established supporting the logic of Bloom's adapted taxonomy (e.g. Kraiger et al. 1993). The standardised indirect (mediated) effect of cognitive outcomes on the affection was 0.110, while cognitive and skill-based outcomes explained 2.5% of the variance in affection. In the Estonian sample, the influence of cognitive outcomes on affection remained significant ($R=0.192$, $p<0.05$) alongside other regression weights, and therefore, partial mediation was established. The standardised indirect effect was 0.184, while cognitive and skill-based outcomes explained 20.4% of the variance in affection.

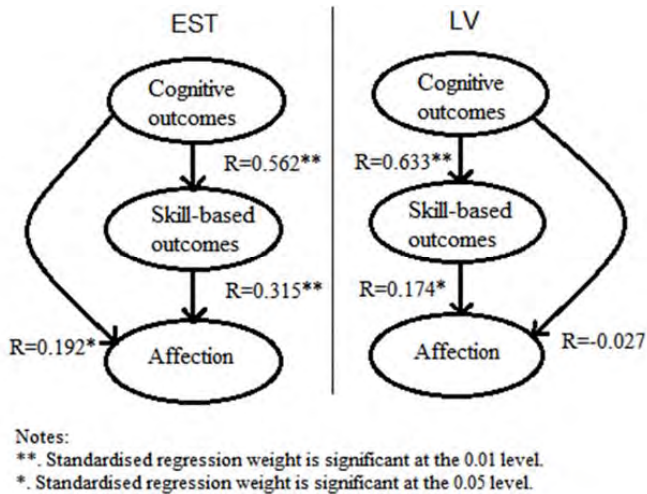


Figure 7. Testing the mediation relationship between knowledge and affection

The stepwise mediation regression brought about quite similar results, confirming the mediated relationship between cognitive and affective outcomes in both countries. The baseline model consisted of control variables related to basic demographic characteristics (age, gender, parents-entrepreneurs) as well as prior entrepreneurial proclivity, attitudes to educators, and graduate status that could have an influence on the formation of affective outcomes. Neither of the correlations between the variables was especially high, though many were significant indicating that they share common variance.

In the Estonian sample, cognitive outcomes had a positive and significant effect on affective outcomes (model 2), but when skill-based outcomes entered the model (model 3), this significance dropped because the direct effect was “taken over” by the new variable. Therefore, with control variables, full mediation was established (see Table 25a).

In the Latvian sample, the initial direct effect of cognitive on affective outcomes was non-significant (model 2), yet both positively correlated with the potential mediator. Just like in the structural model, the introduction of skill-based outcomes to the regression (model 3) showed the significant positive effect of this predictor on the criterion variable (regressand), and made the direct effect even negative ($B < 0$), yet not significantly (see Table 25b). McKinnon et al. (2007) refer to a similar case as inconsistent mediation, which does not require the causal variable (cognitive outcomes) to predict or even be correlated with the outcome (affective outcomes), while other conditions – suppression of the causal variable when the

mediator is brought into the model, causal relationship between the mediator and the outcome – are met.

Table 25a. The mediating effect of cognitive on affective outcomes in Estonia

Indep. variables	Affective outcomes					
	Model 1		Model 2		Model 3	
	B	S.E.	B	S.E.	B	S.E.
Age	-0.010	0.036	0.002	0.035	-0.016	0.034
Parent-entrepreneur	0.008	0.061	0.025	0.059	0.022	0.057
Gender	-0.113 ⁺	0.061	-0.134*	0.060	-0.146*	0.057
Prior proclivity	0.201***	0.023	0.172***	0.024	0.158***	0.023
Graduate status	-0.026	0.057	-0.019	0.055	-0.009	0.053
Attitudes to educators	0.084*	0.028	0.061*	0.028	0.073**	0.027
Cognitive outcomes			0.137***	0.038	0.052	0.042
Skill-based outcomes					0.166***	0.039
R ²	0.336		0.375		0.428	
ΔR ²	0.336***		0.039***		0.052***	

Notes: +p<0.10; *p<0.05; **p<0.01; ***p<0.001.

Table 25b. The mediating effect of cognitive on affective outcomes in Latvia

Indep. variables	Affective outcomes					
	Model 1		Model 2		Model 3	
	B	S.E.	B	S.E.	B	S.E.
Age	-0.024	0.048	-0.022	0.048	-0.016	0.048
Gender	-0.051	0.056	-0.057	0.056	-0.073	0.056
Parent-entrepreneur	0.105 ⁺	0.058	0.109 ⁺	0.058	0.114*	0.057
Graduate status	-0.039	0.057	-0.050	0.058	-0.045	0.058
Prior proclivity	0.206***	0.023	0.202***	0.023	0.195***	0.023
Attitudes to educators	0.080**	0.027	0.072*	0.029	0.062*	0.028
Cognitive outcomes			0.041	0.038	-0.025	0.044
Skill-based outcomes					0.118**	0.042
R ²	0.253		0.256		0.275	
ΔR ²	0.253**		0.003		0.020*	

Notes: +p<0.10; *p<0.05; **p<0.01; ***p<0.001.

Table 26 summarises the results of testing the first and second hypotheses.

Table 26. Results of testing H1 and H2

No.	Hypothesis	Latvian sample	Estonian sample
H1a	<i>There is a positive correlational relationship between cognitive and skill-based outcomes</i>	<i>Strongly supported</i>	<i>Strongly supported</i>
H1b	<i>There is a positive correlational relationship between skill-based and affective outcomes</i>	<i>Supported</i>	<i>Strongly supported</i>
H1c	<i>There is a positive correlational relationship between affective and cognitive outcomes</i>	<i>Partly supported</i>	<i>Strongly supported</i>
H2	<i>The relationship between cognitive and affective outcomes is mediated by skill-based outcomes</i>	<i>Supported</i>	<i>Strongly supported</i>

7.3.3 Comparison of learning outcomes: testing H3

The learning outcomes were compared maintaining the original grouping by HEI and regrouping the HEIs by form of intervention. The former was necessary in view of the qualitative differences in the EE delivery between the HEIs. The latter was the original focus of the testable hypotheses H3 and H7. These two versions of the fixed independent variable thus complemented each other in depicting the key patterns in the quantitative data.

One-way ANOVA is a common method for identifying statistically significant differences between the means of three or more independent groups. However, this method on its own is often insufficient to reach reliable conclusions, because other variables that might influence the setting are not taken into account. ANCOVA overcomes this limitation and extends the analysis by incorporating a range of covariates, the consecutive inclusion of which also changes the R^2 (variance explained) of a certain model. With the help of the analysis of (co)variance, knowledge of the levels of prior competences in the current design considerably enriches our understanding of the resulting levels of the learning outcomes as well as of the impact of EE at each HEI mitigating the limitation of cross-sectional design. First, this allows us to compare levels of prior competences; second, to track the differences between the means before and after adjustments; and third, to map the standardised levels of prior competences and the final learning outcomes to reveal the overall trends in cognitive, skill-based and affective learning attributable to EE.

Before running the tests, it was ascertained that the data met most of the basic assumptions including but not limited to: independence of observations, approximately normal distribution of observations on cognitive, skill-based and affective outcomes, and their residuals for each group of the independent variable, homogeneity of variance, and homoscedasticity. Customarily, the entire set of assumptions was not met and not for all groups, but the results were acceptable to enable comparisons and to permit the tests, which can tolerate several violations and still produce valid results. The details are enclosed with Annex 12.

The affective outcomes composite comprised one lead component (affection for entrepreneurship) and five other multi-item components. Descriptive statistics of these variables by HEI are presented in Annex 13. The experiential HEI C in the Estonian sample consistently leads in five out of six components (HEI B has the highest mean in the attitude to failure). The predominantly experiential HEI F in the Latvian sample leads in the mean values of four components – HEI G overtakes the leadership in the attitude to new learning and in the need for achievement.

1) Mean values of the learning outcomes before and after adjustments

The comparison of the unadjusted mean values of the perceived learning outcomes indicated notable differences in the affective and skill-based outcomes between the Estonian HEIs: { $F(3,207)=5.320$, $p<0.001$ } and { $F(3,207)=2.520$ $p<0.059$ }, respectively. The graduates from HEI C had higher levels of affective outcomes than their counterparts from HEIs A and D (5% level), yet this still does not say much about the EE impact, because the subjects might have exited the programmes simply retaining the initial difference in prior proclivity that was registered earlier (7.2.1). That said the respondents from HEI B could have gained in affective learning on similar grounds. As for entrepreneurial skills, the graduates from HEI C overrode their counterparts from HEI A (yet on a 10% level, $p<0.069$), which is likely to represent the gain in skill-based learning given no differences in prior entrepreneurial experience between the schools' graduates.

In the Latvian sample, one significant difference in the affective outcomes between HEIs F and G was registered { $F(3,302)=2.679$, $p<0.047$ }, though a similar difference existed before the EE intervention, whereas the graduates from the most experiential HEI G had notably lower prior entrepreneurial aspirations than the graduates from the predominantly experiential HEI F. Therefore, the registered difference should be controlled for a range of possible covariates, prior aspirations in particular, before being finally established.

Adjustments to the learning outcome means were introduced in three stages. At the first stage, three socio-demographic variables – age, gender and parent-entrepreneur – served as the covariates. At the second stage, the mean values adjusted for the respective prior competences/experiences entered the models in addition to the aforementioned demographic variables. Finally, attitudes to educators and graduate status were added to the models because the former could directly influence the outcome formation, and the latter involved the time difference that could affect how well the respondents remembered the changes or made sense of the learning outcomes. MA student status was not included in the models for the reason that doing a master degree was associated with no differences in the reported changes in knowledge, skills or attitudes.

From the first to the third stage, the amount of explained variance increased by 3.4 – 24.2% in the Estonian sample and by 7.5 – 19.6% in the Latvian sample. This way, the analysis gave due account to the variables that underpinned the starting significant differences between the groups of respondents identified as a result of the matching tests. In spite and in view of the fact that prior knowledge, experience and proclivity were significantly inter-correlated in both samples ($p < 0.01$), the reported learning outcome levels were adjusted for the related prior competences, so that prior knowledge was used as a covariate of the cognitive outcomes, prior proclivity as a covariate of the affective outcomes; in the case of the skill-based outcomes, both prior entrepreneurship and work experience were controlled for because the latter could have influenced the perceived gain in skills from EE as well. Experiments with several combinations of covariates forestalled the version presented here as the most optimal in terms of the number of covariates, their significance as well as the logical relation. For instance, the inclusion of prior experience in the cognitive or affective outcome models would not influence the findings, even with the inclusion of prior knowledge in the skill-based or affective outcome models. The only exception concerned prior entrepreneurial aspirations that were significant in all the models. This is comprehensively addressed right after the comparisons of the learning outcomes by the form of intervention. See Annexes 14a and 14b for a detailed presentation of the means' adjustment stages.

Adjustments of a p-value for multiple comparisons from both Bonferroni and Šidák were used to double check the significance levels. Unlike Fisher's LSD, these methods control for the family-wise error rate, or counteract the problem of multiplicity that arises from multiple hypotheses being tested in pair-wise comparisons. As the number of hypotheses increases, so does the likelihood of differences occurring, and therefore, the chances of incorrectly rejecting the null hypothesis (that the means are similar), or making the Type I error, increase as

well. The first correction is calculated as α/j , where α is the desired probability level and j is the number of hypotheses tested. The second correction is calculated as $\alpha_{\text{sid}} = 1 - (1 - \alpha)^{1/j}$. For instance, if $j=10$ and $\alpha=0.05$, the Bonferroni-adjusted level will be 0.005 and the Šidák-adjusted level is approximately 0.005116. The Šidák-alpha is always a bit larger, yet less conservative and often more powerful as the number of tests gets larger (Cohen 2004). In addition, it is more suitable when one can assume that the conducted tests are mutually independent. In some cases, the results from the same data may differ depending on the correction method chosen. Hence, to decrease the likelihood of capitalising on the Type II error; that is, deeming important differences non-significant, both the Bonferroni and Šidák adjustments were used. Annexes 14a and 14b also provide confidence intervals in the spirit of the most recent debate on p-values and statistical inference (Trafimow and Marks 2015). The p-value is primarily a tool for deciding whether to disprove the null hypothesis or not, but it does not help reasoning and interpreting results. Therefore, one should be wary when selecting types of post-hoc tests or methods of mean adjustments.

In the Latvian sample, already at the second stage no statistically significant differences between the schools appeared in cognitive outcomes $\{F(3,298)=1.127, p<0.339\}$, skill-based outcomes $\{F(3,296)=1.174, p<0.320\}$ and affective outcomes $\{F(3,298)=0.551, p<0.648\}$. The non-significant differences were maintained at the third stage of adjustments in cognitive outcomes $\{F(3,295)=0.548, p<0.650\}$, skill-based outcomes $\{F(3,294)=2.048, p<0.107\}$, affective outcomes $\{F(3,296)=0.570, p<0.635\}$. This unexpected finding suggests that as far as the learning outcomes are concerned (and in terms of the null hypothesis testing procedure) it does not matter significantly which school students should attend to experience EE in the Latvian context.

In the Estonian sample, the HEIs did not differ in terms of cognitive outcomes at any of the correction stages. The differences in affective and skill-based outcomes remained throughout, the final test yielded: $\{F(3,201)=3.446, p<0.018\}$ and $\{F(3,200)=2.272, p<0.081\}$, accordingly. Pair-wise comparisons of the estimated marginal means showed that: 1) the experiential HEI C scored higher than HEI D in affective outcomes ($p<0.05$); 2) HEI C still outperformed HEI A in the skill-based outcomes at the 10% level ($p<0.099$) using the Šidák adjustment (with Bonferroni, $p<0.103$). The latter suggested that the Estonian students would be better off in terms of skill-based outcomes by attending HEI C. The neutralisation of the difference in the affective measures between HEI C and A hinted at the possible mutually non-exclusive scenarios: the graduates from the latter school benefitted from the affective learning; the affective outcomes

decreased slightly at HEI C, but remained unchanged or also decreased at HEI D. To shed light on these dynamics, the analysis proceeds with mapping the EE impact trends.

2) Mapping the EE impact trends in cognitive, skill-based and affective learning

Figures 8-10 display the results of the mapping procedure by HEI. The very first bar next to each school represents the prior level of knowledge, skills or aspirations adjusted for age, gender and parent-entrepreneur for the reason that these demographic factors could have an impact on prior competences and experience. The second bar reflects the level of learning outcomes adjusted for the related prior competence to visualise the differences between this and the first bar. This shows the direction of the perceived EE impact. The third bar of the final level of learning outcomes takes into account all the employed covariates and controls. The variables were standardised to enable comparisons.

Graduates from the experiential HEI C in Estonia apparently benefited in developing entrepreneurial knowledge and skills. Similar trends were observable in the traditional HEI D, where the net gain in the cognitive domain was comparatively similar, but the increase in the skill-based domain seemed small not to mention its significance (unlike in HEI C that was the most salient). In the predominantly traditional HEI A, on the contrary, there was a sharp decrease in cognitive outcomes. The downward trend was also detected in skills relative to prior entrepreneurial experience in this school. The changes in HEI B in these two domains were not unidirectional with the lowest level of perceived skill-based outcomes in the Estonian sample. Most probably, the difference in the skill-based outcomes between HEI C and HEI A but not HEI B was marked as approaching 5% significance in the respective post-hoc test because of the smallest number of observations, the highest standard error, and the wider confidence interval in HEI B that brings greater uncertainty with respect to the effect size.

As for the affective outcomes, initially the highest prior aspirations in HEI C slightly decreased supposedly alongside the improved understanding of the entrepreneurship realities (the “affection for entrepreneurship” component explained over 50% of the variance in the affective outcomes). The same tendency was observed in the traditional HEI D, which markedly mirrors the learning outcome trends of the experiential HEI C. In contrast, the affective outcomes in HEI A and B rose relative to the prior level of aspirations, particularly in the latter school. Despite HEI A being diagnosed as predominantly traditional and situated closer to the border with the demand model than other schools, relying on graduate

perceptions, performance-wise it did not seem to surpass the traditional HEIs D or B at the time.

The analysis also revealed the following covariates that positively influenced the dependent variables: prior aspirations in the case of the affective outcomes ($p < 0.001$, $\eta^2 = 0.266$)⁶, attitudes to educators ($p < 0.072$, $\eta^2 = 0.016$) and age ($p < 0.092$, $\eta^2 = 0.014$) in the case of the cognitive outcomes were significant at the 10% level. The post-hoc tests showed that attitudes to educators indicated more open (10% level) and interactive (1% level) relationships at HEI C than at HEI A.

One more noteworthy effect concerned the interaction of the grouping variable “HEI” with the covariate “graduate status” that was revealed while testing the ANCOVA assumptions (Annex 12). Judging by the means plot, the significance of this interaction was sourced from the imminent graduates scoring less in cognitive outcomes at HEIs A and C, while the reverse was the case at HEI D, which tends to attract older applicants who presumably are able to make sense of the newly acquired knowledge “on the spot” unlike younger students. Overall, the adjustment of means in the Estonian sample exerted a minor influence on the final outcome levels if compared with the Latvian sample.

Two broad patterns were evident in the Latvian data: a) the changes in the schools with experiential EE interventions (G and F) were reverse in all cases, whereas the level of acquired skills relative to prior experience decreased sharply at HEI G as evaluated by the respondents; b) irrespective of the intervention type, schools leading in prior competences (HEI H in prior knowledge, HEI G in prior experience, HEI F in prior aspirations) demonstrated a decrease in the resulting learning outcomes, while the reverse was true for the schools with the lowest levels of prior competences (HEI G or E in the cognitive domain, HEI E in the skill-based domain, HEI G in the affective domain).

The graduates from the most experiential HEI G in the sample notably benefited from affective learning. The intervention at the predominantly experiential HEI F did make a small positive impact on skill-based outcomes of the graduates. Like in the Estonian HEI C, the resulting level of affective outcomes was lower relative to the initial career aspirations in this school, which might be a valuable result of the intervention if young people start reassessing their entrepreneurial attitudes and self-perceptions. In the traditional HEIs E and H, the graduates increased their skills relative to the level of prior experience in entrepreneurship as a result of EE

⁶ Eta squared (η^2) referred to in the text and in the figures shows the proportion of the variability attributable to the factor (Levine and Hullett 2002). This estimate of the magnitude of effect is relatively independent from the sample size, to which the null hypothesis testing is sensitive. It is calculated as the sum of squares between the groups divided by the total sum of squares; in the SPSS output of ANCOVA, partial η^2 has the same value as η^2 (ibid 2002).

in spite of the small decrease in the affective domain. When it came to cognitive outcomes, the sharpest decline in the sample was registered in HEI H, while HEIs E and G managed to benefit its students.

Furthermore, the analysis signposted that other factors positively influenced the dependent variables: attitudes to educators ($p < 0.001$, $\eta^2 = 0.073$) and graduate status ($p < 0.01$, $\eta^2 = 0.027$) in the case of cognitive outcomes; attitudes to educators ($p < 0.001$, $\eta^2 = 0.070$) and gender (being female) ($p < 0.10$, $\eta^2 = 0.011$) in the case of the skill-based outcomes; parent-entrepreneur ($p < 0.01$, $\eta^2 = 0.028$), attitudes to educators ($p < 0.001$, $\eta^2 = 0.073$) and prior career aspirations ($p < 0.001$, $\eta^2 = 0.190$) in the case of the affective outcomes. Bonferroni post-hoc tests showed that attitudes to educators indicated more open and supportive relationships at HEI E than at HEI H (10% level), more simple and interactive relationships at HEI G than at HEI H (5% level) as well as more interactive relationships at HEI G than at HEI F (10% level).

The positive difference that being a graduate made in cognitive outcomes despite the potential of the respondents “forgetting” the impact of the course might have occurred because they had more time to reflect upon the course and their subjective gain from it (Henry et al. 2007). Nonetheless, significant differences were not detected in relation to skill-based and affective outcomes of recent and imminent graduates in the Estonian and Latvian samples. There were no differences in the learning outcomes between the groups of respondents that graduated in 2011 and 2012–2013 either.

The positive effect that prior proclivity towards entrepreneurship had, literally meant that those who had higher prior proclivity also reported greater affective outcomes. Setting aside the differences between the HEIs, the comparatively large size of this effect suggested that the boost of affective outcomes was to a lesser degree attributable to EE in both samples. In the HEIs where the improvement in affective learning was exerted (A, B and G), the educators might have done a good job in inspiring and “tuning” their students into entrepreneurial activity, but at the expense of skill-based learning. The detected decreases in affective learning can also have a negative connotation, especially if such components as self-confidence, sense of self-reliance or attitude to new learning and failures were influenced negatively. The cross-sectional design does not make it possible to claim this for certain, yet it is useful to get an idea of the differences between the HEIs in terms of the individual components of affective outcomes. In addition, it is possible to compare the dynamics of the affection component with the whole composite; to contrast the learning outcome levels of the entrepreneurship and non-

entrepreneurship graduates in the Latvian sample, and of the business background and non-business background graduates in the Estonian sample.

Examining the differences between the adjusted mean values of affection, creative attitude and self-confidence, need for achievement, sense of self-reliance, attitude to new learning and attitude to risk and failure by HEI uncovered the following insights. In the Estonian sample, the need for achievement ($p < 0.001$), sense of self-reliance (10% level) and attitude to new learning (10% level) were notably higher at HEI C than at HEI D. Females had much lower affection for entrepreneurship and attitude to risk and failure, but better attitude to new learning than males. This pattern, however, mirrored quite generic gender differences; in other words, the EE intervention did not affect it. Younger people aged 20–25 had a considerably higher need for achievement/ambitiousness but lower sense of self-reliance and attitude to new learning than their older counterparts (again, a logical pattern seemingly unaffected by EE). Prior aspirations were highly significant in all the cases exhibiting a positive influence; indicatively, its effect was the largest in the affection component. These effects are summarised in Table 27.

In the Latvian sample, as in the case of the whole composite, no differences between the HEIs were found in its individual components. Prior aspirations persistently predicted four out of six affective measures, being non-significant for the sense of self-reliance and attitude to new learning. Attitudes to educators drove up all but two components, affection and attitude to risk/failure. Unlike in the neighbouring country, gender differences were less salient suggesting that EE also positively influenced the affective outcomes of females. Yet again, younger respondents aged from 20 to 25 had a greater need for achievement but a lower sense of self-reliance. Finally, the graduates who had a parent-entrepreneur showed a higher level of attitude to risk and failure in this model (those individuals also scored higher on all the components except for the attitude to new learning).

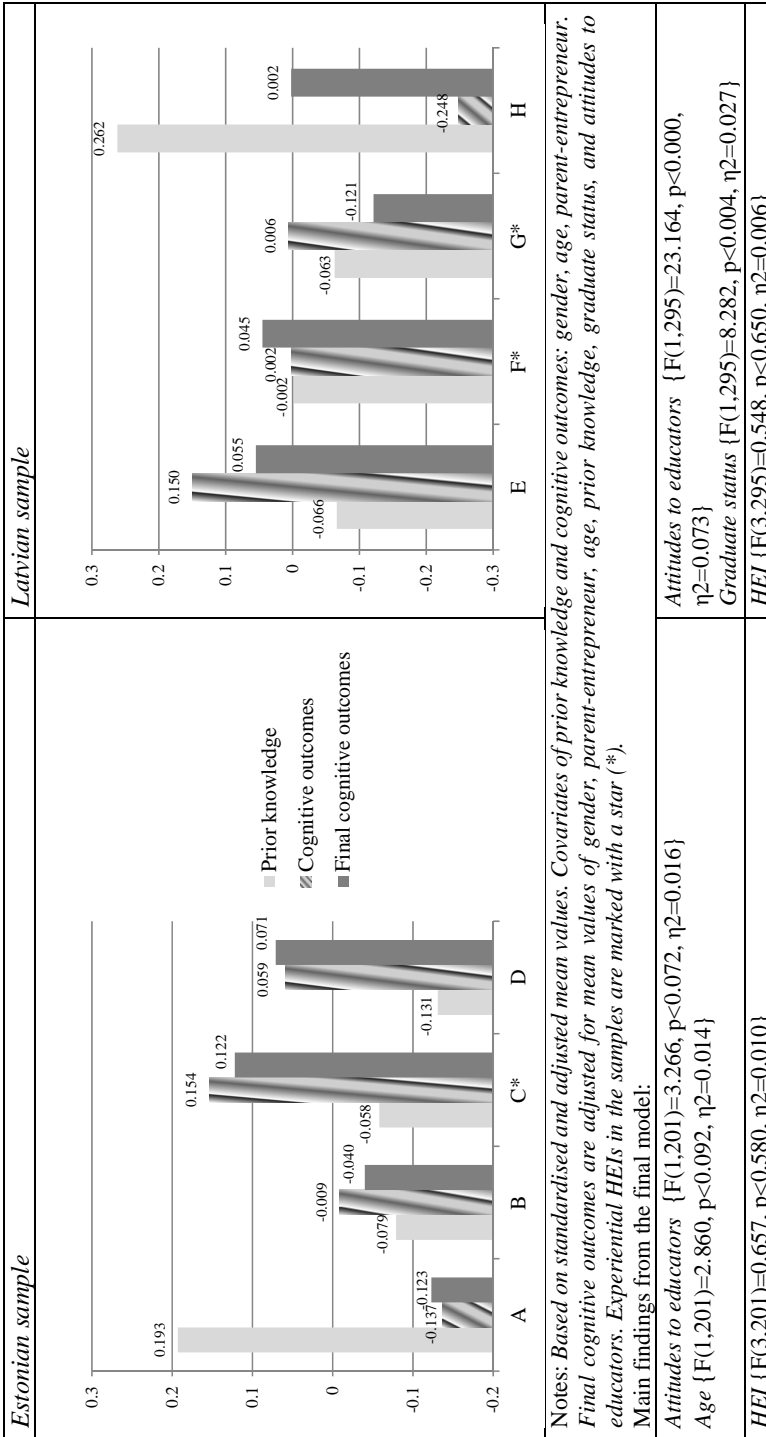


Figure 8. Initial level of knowledge about entrepreneurship and perceived cognitive outcomes of EE

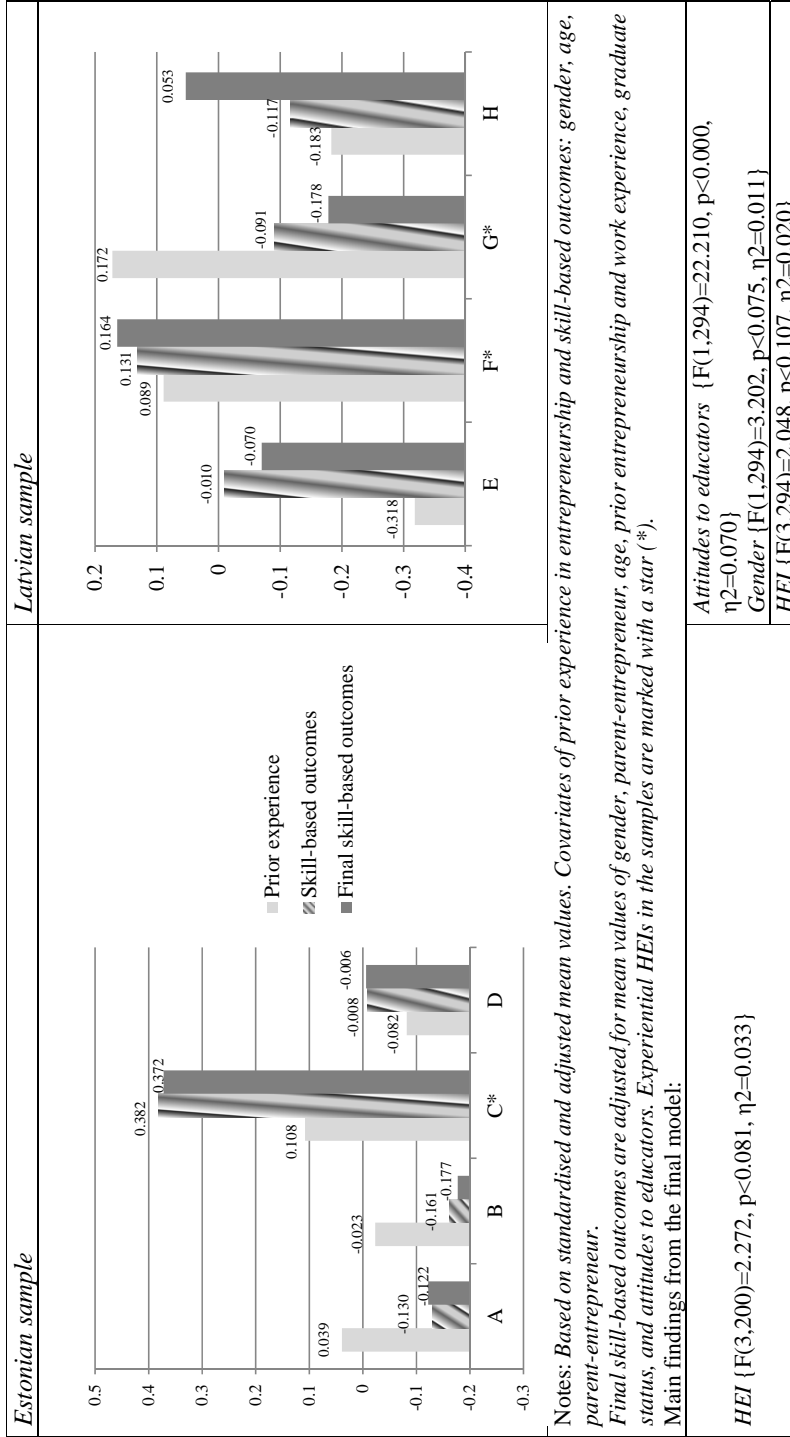


Figure 9. Initial level of entrepreneurship experience and perceived skill-based outcomes of EE

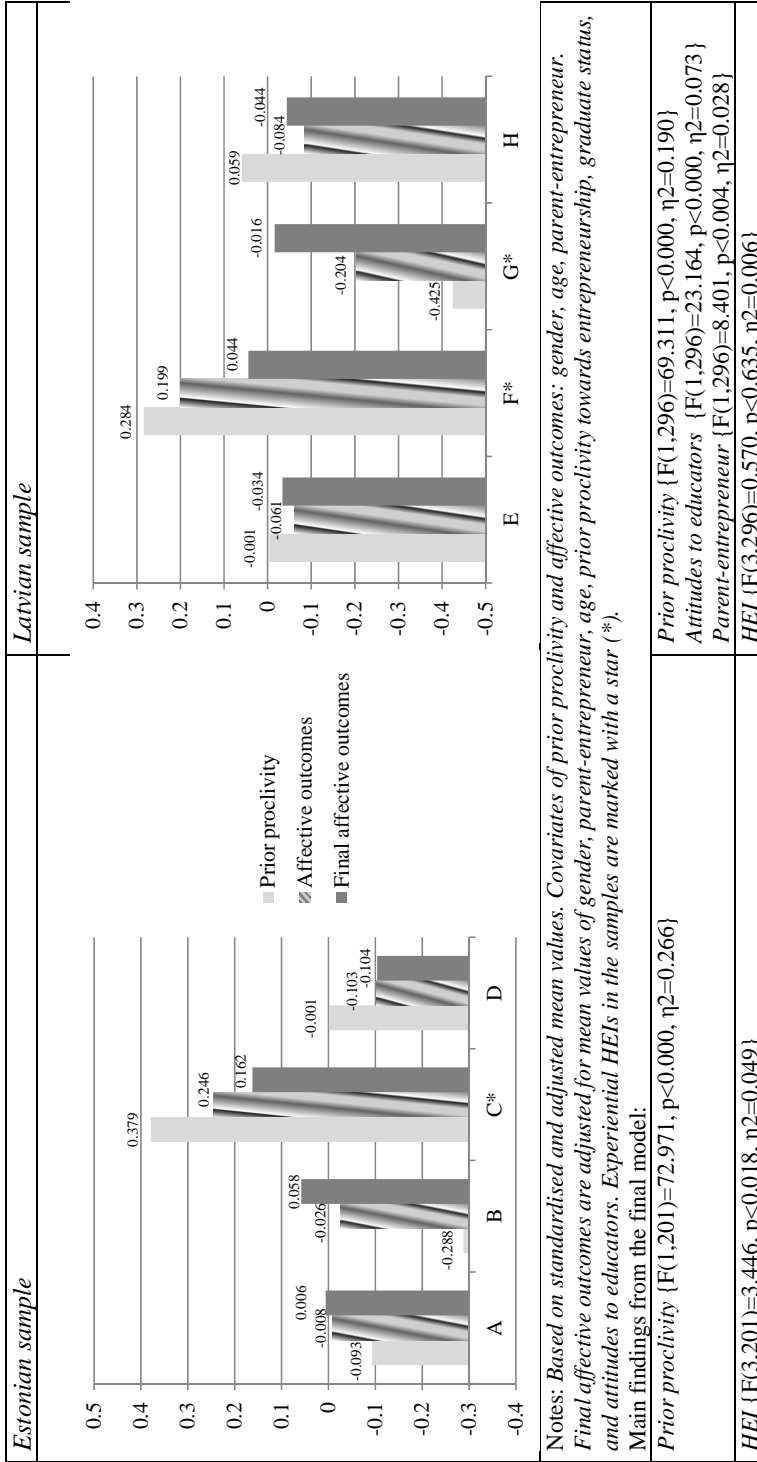


Figure 10. Initial level of entrepreneurial career aspirations and perceived affective outcomes of EE

Table 27. Significant predictors of the affective outcome components

<i>Affective outcome component</i>	<i>Estonian sample</i>	<i>Latvian sample</i>
Affection	Females vs. males ($p < 0.05$), $\eta^2 = 0.025$ Prior proclivity ($p < 0.001$), $\eta^2 = 0.368$	Prior proclivity ($p < 0.001$), $\eta^2 = 0.313$
Creative attitude/ self-confidence	Prior proclivity ($p < 0.001$), $\eta^2 = 0.128$	Prior proclivity ($p < 0.001$), $\eta^2 = 0.062$ Attitudes to educators ($p < 0.01$), $\eta^2 = 0.025$
Need for achievement	Age ($p < 0.05$), $\eta^2 = 0.021$ Prior proclivity ($p < 0.001$), $\eta^2 = 0.035$ HEIs ($p < 0.001$), $\eta^2 = 0.085$	Age ($p < 0.05$), $\eta^2 = 0.013$ Attitudes to educators ($p < 0.05$), $\eta^2 = 0.016$ Prior proclivity ($p < 0.001$), $\eta^2 = 0.040$
Sense of self-reliance	Age ($p < 0.05$), $\eta^2 = 0.024$ Prior proclivity ($p < 0.05$), $\eta^2 = 0.029$ Attitudes to educators ($p < 0.01$), $\eta^2 = 0.040$ HEIs ($p < 0.05$), $\eta^2 = 0.040$	Age ($p < 0.05$), $\eta^2 = 0.021$ Attitudes to educators ($p < 0.05$), $\eta^2 = 0.021$
Attitude to new learning	Age ($p < 0.05$), $\eta^2 = 0.025$ Females vs. males ($p < 0.01$), $\eta^2 = 0.035$ Prior proclivity ($p < 0.05$), $\eta^2 = 0.020$ HEIs ($p < 0.05$), $\eta^2 = 0.038$	Attitudes to educators ($p < 0.05$), $\eta^2 = 0.017$
Attitude to risk/failure	Females vs. males ($p < 0.05$), $\eta^2 = 0.029$ Prior proclivity ($p < 0.05$), $\eta^2 = 0.081$	Prior proclivity ($p < 0.001$), $\eta^2 = 0.030$ Parent-entrepreneur ($p < 0.05$), $\eta^2 = 0.013$

The lead component of the affective outcome composite, affection towards entrepreneurship, comparable with the prior entrepreneurial career aspirations closely reflected the dynamics of the whole composite (see Annexes 15 and 16). It could have also determined these dynamics in view of the large amount of variance it explained in the data. Therefore, the decreases in affective learning at HEIs C, D, E, F and H were very likely to be attributable to the more cautious resulting attitudes towards career in entrepreneurship to a large extent. This was particularly evident at HEI C, where more close examination of the component means shows that the attitude to risk and failure in this school was quite moderate and presumably had lowered as a result of the intervention (alongside affection). At the traditional HEIs D, E and H, however, other components also drove the composite down: the need for achievement and attitude to new learning (D, E, H), sense of self-reliance (D, H). Yet, it was not possible to establish by HEI whether these measures had been low from the outset or went down after the interventions.

Figures 11–13 display the results of the comparisons of the perceived learning outcomes by the form of intervention. It maps both the original HEIs and their regrouping applying gradient marking to make the groupings easily distinguishable. In the Estonian sample, logically only HEI C was contrasted to the traditional HEIs A, B and D. The ANCOVA tests confirmed statistically significant differences between the experiential and traditional forms of intervention in the case of skill-based and affective outcomes in this sample, as well as the lack thereof in the Latvian sample. The difference in affective outcomes was sourced from: need for achievement (mainly, $p < 0.01$), creative attitude/self-confidence as well as sense of self-reliance and affection ($p < 0.10$). The estimated marginal means of the learning outcomes were all higher in the experiential group in Estonia. However, the reverse was found in the case of knowledge about entrepreneurship in Latvia where HEI G levelled the overall group mean down while HEI A levelled the traditional group's mean up. The mean values for skills and attitudes in the experiential group were above the traditional group.

To favour the comparison of the learning outcome means, let us share the findings of one more ANCOVA test, where prior career aspirations/proclivity towards entrepreneurship acted as the grouping variable because it proved to be significant in many of the conducted tests. Those who did not want to become entrepreneurs (either probably or definitely) constituted the first group. The second group included undecided individuals (“may be”). The final group was for aspiring entrepreneurs (definite or probable). Strikingly, even after all the previously applied adjustments the graduates initially positively predisposed towards entrepreneurship had considerably higher perceived learning gains from EE in knowledge and skills in both samples. Therefore, the aspiring entrepreneurs always scored better than “non-entrepreneurs” ($p < 0.01/0.05$). However, in the case of affective outcomes the estimated marginal means were lower for the aspiring entrepreneurs than for the two other groups in both samples. Therefore, those who did not want to become entrepreneurs before the EE interventions gained more (albeit non-significant statistically) from the affective learning. Annex 17 provides details of these findings.

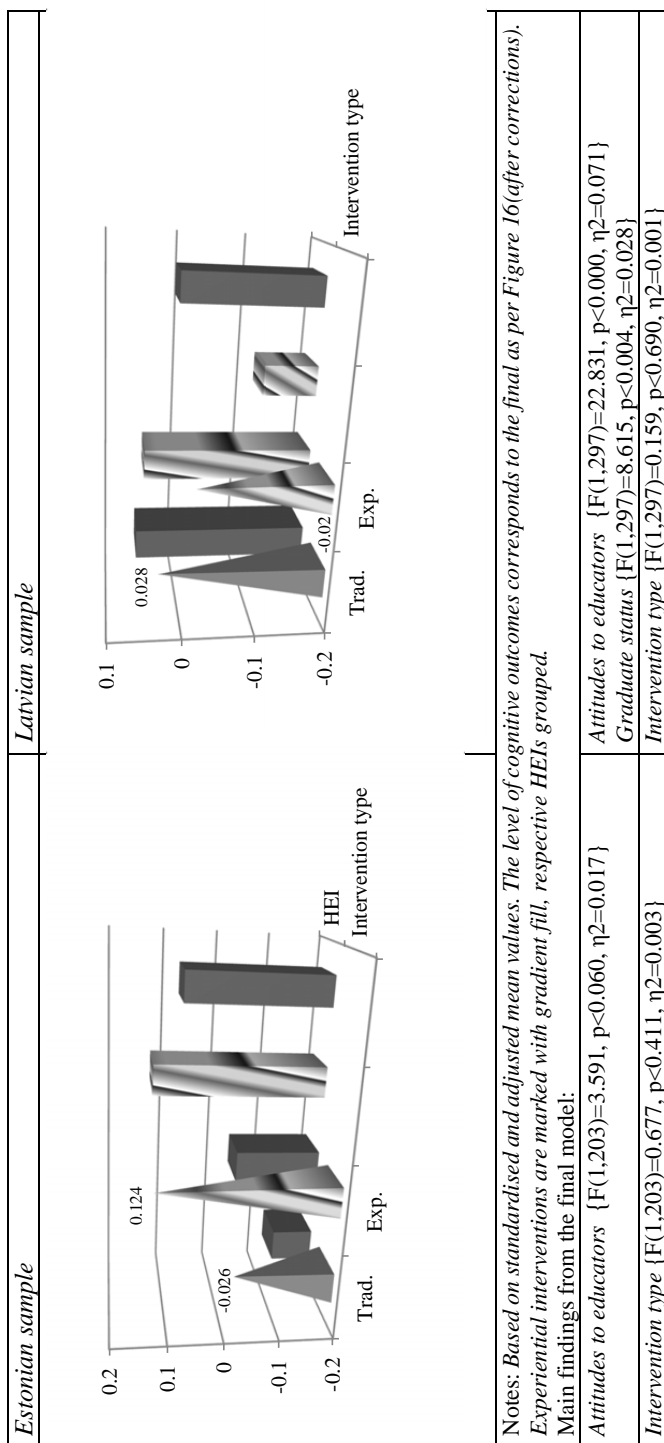


Figure 11. Comparison of perceived cognitive outcomes by form of intervention

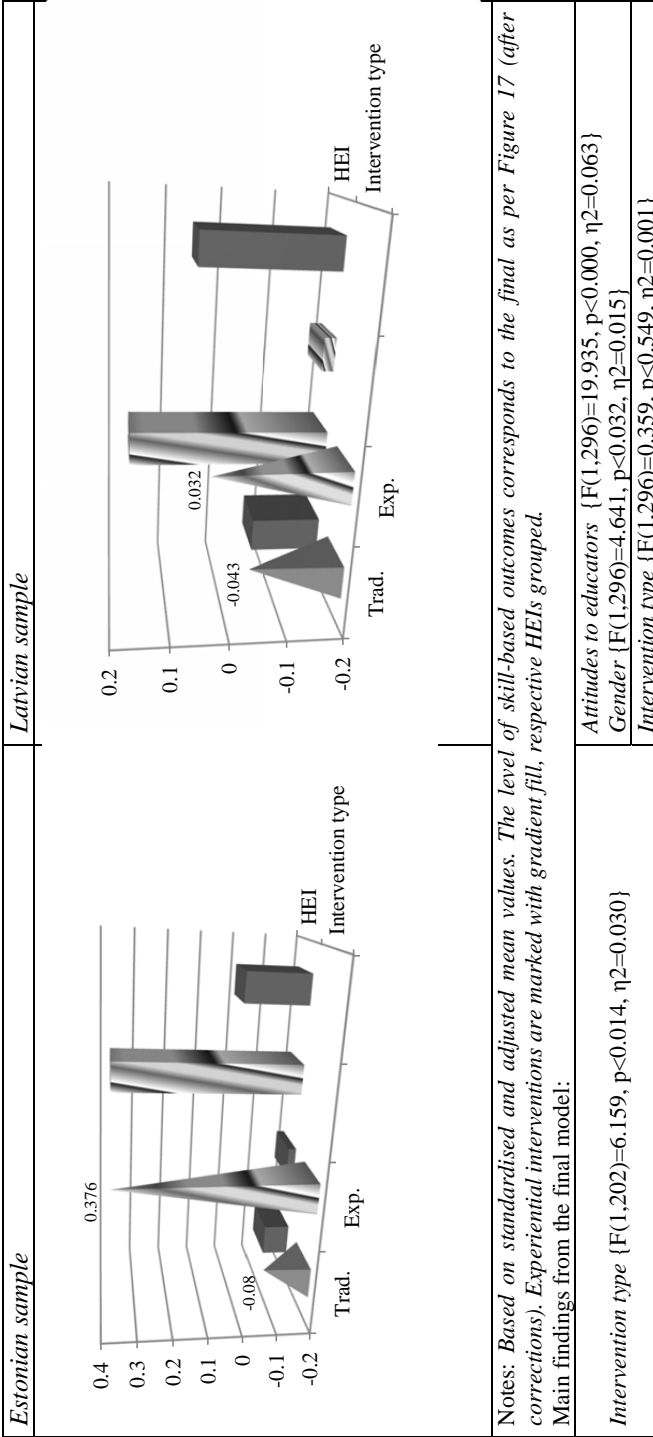


Figure 12. Comparison of perceived skill-based outcomes by form of intervention

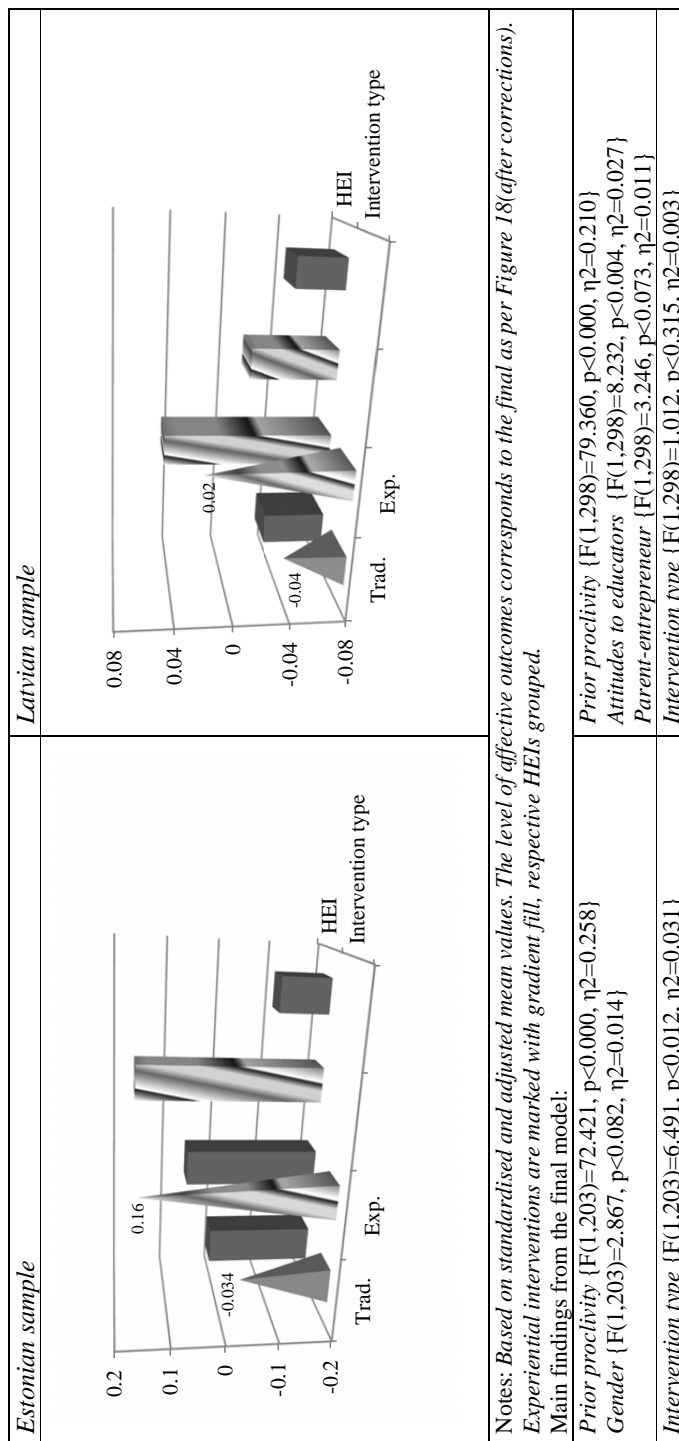


Figure 13. Comparison of perceived affective outcomes by form of intervention

3) Supporting the sampling frame and the learning outcomes

As a counterweight to the cross-sectional design limitations, the comparisons with non-entrepreneurship students in the Latvian sample and with non-business students in the Estonian sample were a vital source of analytical information that supported the sampling frame in each country and helped reinforce the entrepreneurial knowledge, skills and affection measured as *outcomes* of EE. The mean values in this test were compared with no adjustments using the simple non-parametric Kruskal-Wallis procedure due to the small size of the control groups. With no statistically significant differences (5% level) in self-assessed prior entrepreneurial knowledge, experience and aspirations between the comparable groups in both samples, the tests signposted: 1) better post-intervention cognitive and skill-based outcomes as well as affection for entrepreneurship among the graduates who studied the discipline in Latvia; and 2) higher levels of entrepreneurial knowledge and skills among business graduates in Estonia. This is illustrated in Table 28 below and generally confirms the expectations and findings of previous studies that employed quasi-experimental design; for example, Rauch and Hulsink (2014) and Souitaris et al. (2007). The descriptive statistics are provided in Annex 18a–b.

Table 28. Results of the Kruskal-Wallis test: supporting the learning outcomes

Variable/country	<i>Estonia: business vs non-bus.</i>	<i>Latvia: entrep. vs non-entrep.</i>
<i>Cognitive outcomes</i>	• $\chi^2=12.148$, $df=1$, $p<0.000$	• $\chi^2=13.621$, $df=1$, $p<0.000$
<i>Skill-based outcomes</i>	• $\chi^2=6.202$, $df=1$, $p<0.013$	• $\chi^2=4.828$, $df=1$, $p<0.028$
<i>Affective outcomes – affection</i>	• $\chi^2=1.605$, $df=1$, $p<0.205$	• $\chi^2=7.067$, $df=1$, $p<0.008$
Creative attitude and self-confidence	• $\chi^2=0.548$, $df=1$, $p<0.459$	• $\chi^2=0.067$ $df=1$, $p<0.796$
Need for achievement	• $\chi^2=1.151$, $df=1$, $p<0.283$	• $\chi^2=1.495$ $df=1$, $p<0.221$
Attitude to new learning	• $\chi^2=0.089$, $df=1$, $p<0.765$	• $\chi^2=0.070$ $df=1$, $p<0.791$
Sense of self-reliance	• $\chi^2=1.854$, $df=1$, $p<0.173$	• $\chi^2=0.249$ $df=1$, $p<0.618$
Attitude to risk and failure	• $\chi^2=1.427$, $df=1$, $p<0.232$	• $\chi^2=0.021$ $df=1$, $p<0.884$

It is also worth noticing that the mean values of the sense of self-reliance and attitude to risk and failure were slightly lower among entrepreneurship graduates in the Latvian sample, which might indeed represent the post-hoc levelling off effect. However, affection, creative attitude and self-confidence, attitude to risk and

failure were also lower among the business background graduates in the Estonian sample. This signifies that the knowledge and skills of newcomers in EE can be inversely related to affection and risk-taking; that is, the less one knows about the subject at a deeper level the higher the willingness to pursue entrepreneurial career. In other words, when it comes to a relatively short intervention volume – 6 ECTS points – decreases in affective outcomes can be justifiable unless the process stops there.

4) *Summing it up*

Table 29 summarises the results of testing the third hypothesis. On the whole, the results obtained do not support H3a, H3b, and H3c in the Latvian sample, because after adjusting for covariates, perceived learning outcomes associated with EE interventions diagnosed as experiential (at HEI G) and predominantly experiential (at HEI F) are not significantly higher than the outcomes associated with traditional (at HEI H) and predominantly traditional interventions (at HEI E). This conclusion is true for both types of grouping – by HEI and by form of intervention – and raises concerns about the effectiveness and efficiency of experiential EE in Latvia. If we set aside the statistical significance, the mean values of the skill-based and affective outcomes would favour experiential interventions only if the second type of grouping is pursued.

Table 29. Results of testing H3

No.	Hypothesis	Latvian sample	Estonian sample
H3a	<i>Experiential EE is associated with higher cognitive outcomes than traditional EE</i>	Not supported	Not supported
H3b	<i>Experiential EE is associated with higher skill-based outcomes than traditional EE</i>	Not supported	<i>Supported</i>
H3c	<i>Experiential EE is associated with higher affective outcomes than traditional EE.</i>	Not supported	<i>Supported</i>

In the Estonian sample, H3b and H3c are supported. There was a weak indication of superior skill-based outcomes at HEI C (if compared to HEI A), which became stronger when grouping by form of intervention was applied. Splitting the file by the prior aspirations and running ANCOVA for skills suggested that the aspiring entrepreneurs from HEI C scored considerably higher (1% level) than the aspiring entrepreneurs from HEI A (this essentially sourced the discovered difference, and therefore, H3b is not “strongly supported”). The superiority in the affective outcomes at HEI C (as compared to HEI D) and when contrasted with the

traditional HEIs (A, B, D) held even after the adjustments for the six covariates. Yet, as clarified through the closer examination of the composite, 3 out of 6 measures made this difference that did not include affection (need for achievement, sense of self-reliance and attitude to new learning). H3a, however, does not find statistical support in either of the grouping types. Taken at face value, the mean values of the learning outcomes at HEI C were higher than in the other schools.

7.3.4 Connecting learning outcomes and objective outcomes: testing H4–H6

To test the next set of hypotheses, about the linkages between the learning and objective outcomes, the stepwise multiple linear regressions of employability and nascent intrapreneurship (II), the binary logistic regressions of nascent intrapreneurship (I) and private early-stage EA were run. For the regressions to produce valid results, the underlying data were recommended to meet a number of assumptions as set out below (Lund and Lund 2013):

<i>Assumptions of a multiple linear regression</i>	<i>Assumptions of a binary logistic regression</i>
<ul style="list-style-type: none"> ▪ Independence of errors (residuals). ▪ A linear relationship between the predictor variables and the dependent variables. ▪ Homoscedasticity of residuals (equal error variances). ▪ Residuals normally distributed. 	<ul style="list-style-type: none"> ▪ Independence of cases/errors. ▪ A linear relationship between the continuous predictor variables and the logit transformation of the dependent variable.
<ul style="list-style-type: none"> • No multicollinearity. • No significant outliers or influential points. 	

During the analysis, it has been ascertained that the data largely complied with the assumptions. The details can be found in Annex 19. Furthermore, similarly to the learning outcomes, extra tests were conducted to reinforce employability, nascent intrapreneurship and early-stage EA as the objective *outcomes* of EE.

Based on the Latvian data, 25% of non-entrepreneurship graduates (7 out of 35) became early-stage entrepreneurs in comparison to 32% of entrepreneurship graduates (98 out of 306). The mean values of the latter group were higher for nascent intrapreneurship as well, though the differences were not statistically significant. The mean of employability was slightly higher among 236 entrepreneurship graduates than among 27 non-entrepreneurship graduates. Tables

30a–b display the Kruskal-Wallis test results, the assigned mean ranks and the test statistic. Discounting the fact that the measurement in the current study is short- and mid-term oriented, these figures tend to confirm the higher level of the objective outcomes among the entrepreneurship graduates, as the study by Charney and Libecap (2000) pinpointed.

The test results in the Estonian sample were quite intriguing. We know that the learning outcomes of the non-business graduates who studied entrepreneurship had been expected to be and were indeed lower (knowledge and skills at a 5% level, see Table 28) than those of the business graduates. However, our knowledge about similar effects in the professional life of these two groups of graduates is quite limited. Relying on the small sample of non-business respondents in this study (N=29), it appears that engineering students had higher mean ranks for the three types of the objective outcomes evaluated. Yet again, no statistical differences with the business group (N=211) were detected in this time frame. Despite having much lower resulting levels of cognitive and skill-based outcomes, engineering graduates scored higher in professional life, either in paid or self-employment. The ensuing regressions suggested this was most likely to occur owing to the higher mean values of affection, attitude to risk and failure as well as creative attitude and self-confidence.

Table 30a–b. Results of the Kruskal-Wallis test: supporting the objective outcomes

a) Mean ranks: variable/country, group	<i>Estonia</i>		<i>Latvia</i>	
	<i>Business</i>	<i>Non-business</i>	<i>Entrep.</i>	<i>Non-entrep.</i>
<i>Early-stage EA</i>	120.91	134.28	173.10	152.60
<i>Nascent intrap.</i>	121.67	128.66	171.53	166.34
<i>Employability</i>	120.91	134.28	132.10	131.15

b) Test statistic: variable/country	<i>Estonia: business vs non-bus.</i>	<i>Latvia: entrep. vs non-entrep.</i>
<i>Early-stage EA</i>	• $\chi^2=1.506$, $df=1$, $p<0.220$	• $\chi^2=2.125$, $df=1$, $p<0.145$
<i>Nascent intrap.</i>	• $\chi^2=0.478$, $df=1$, $p<0.489$	• $\chi^2=0.143$, $df=1$, $p<0.706$
<i>Employability</i>	• $\chi^2=0.007$, $df=1$, $p<0.934$	• $\chi^2=0.004$, $df=1$, $p<0.951$

One more common rule of thumb had to be met to estimate the regression models: 10–15 observations per independent variable, 5 in a lenient version of the rule (Lund and Lund 2013). For the linear regressions of employability, $N_{EST}=157$ and $N_{LV}=236$, it was acceptable to include 16–24 independent variables in the models. In the case of nascent intrapreneurship II, 43 and 88, respectively, were

involved in the idea development and implementation phases that limited the allowable number of factors to 9–16 in the linear models. For the logit predictions to be reliable, usually 15 events per variable are recommended. However, based on Vittinghoff and McCulloch' simulations (2007), this rule can be relaxed to 5–10 events. In the regression of nascent intrapreneurship I, 8–12 variables were acceptable. The proportionally similar solution applied for the regressions of the private early-stage EA with 57 and 98 cases of involvement.

The descriptive statistics and correlations of the relevant regression variables (non-standardised) are presented in Tables 31 and 32a–b. The cognitive and skill-based outcomes and nascent intrapreneurship II have mean values of zero and standard deviations of one since they were elaborated from factor scores.

Table 31. General descriptive statistics of the regression variables

Variable (non-Z)	<i>Estonian sample</i>					<i>Latvian sample</i>				
	N	Min	Max	Mean	SD	N	Min	Max	Mean	SD
Employability (comp.)	157	-12.07	9.08	0.03	4.31	236	-12.66	9.37	-0.12	4.20
Nascent intrapreneurship I	211	0.00	1.00	0.20	0.40	306	0.00	1.00	0.29	0.45
Nascent intrapreneurship II	43	-2.04	1.04	0.00	1.00	88	-2.19	1.23	0.00	1.00
Early-stage EA	211	0.00	1.00	0.27	0.45	306	0.00	1.00	0.32	0.47
Cognitive outcomes	211	-2.13	2.22	0.00	1.00	306	-2.79	1.95	0.00	1.00
Skill-based outcomes	211	-2.38	2.09	0.00	1.00	306	-2.87	1.86	0.00	1.00
Affective outcomes (comp.)	211	-1.62	1.15	0.00	0.49	306	-1.60	1.31	0.00	0.54
Prior knowledge	211	0.00	3.00	1.64	0.87	305	0.00	3.00	1.68	0.77
Prior e-ship experience	211	0.00	3.00	0.73	0.85	305	0.00	3.00	0.53	0.77
Prior work experience	211	0.00	3.00	1.51	0.96	305	0.00	3.00	1.08	0.94
Prior e-ship career aspirations	211	1.00	5.00	3.26	1.25	306	1.00	5.00	3.60	1.21
Prior mng career aspirations	211	1.00	5.00	3.24	1.28	306	1.00	5.00	3.98	0.95
Entrep. network	211	0.00	4.00	2.86	1.12	306	0.00	4.00	2.39	1.22
Past intrapreneurship	211	0.00	1.00	0.24	0.43	306	0.00	1.00	0.22	0.41
Female	211	0.00	1.00	0.66	0.47	306	0.00	1.00	0.58	0.48
Parent-entrepreneurs	211	0.00	1.00	0.36	0.48	306	0.00	1.00	0.36	0.49
Parent-manager	211	0.00	1.00	0.29	0.45	306	0.00	1.00	0.53	0.49
Age	211	1.00	3.00	1.70	0.81	306	1.00	3.00	1.27	0.58
Graduate status	211	0.00	1.00	0.54	0.50	306	0.00	1.00	0.63	0.48
Doing MA degree	211	0.00	1.00	0.14	0.35	306	0.00	1.00	0.15	0.35
Intervention type	211	0.00	1.00	0.18	0.38	306	0.00	1.00	0.69	0.46
HEI A/E	211	0.00	1.00	0.35	0.48	306	0.00	1.00	0.19	0.39
HEI B/F	211	0.00	1.00	0.12	0.32	306	0.00	1.00	0.40	0.49
HEI C/G	211	0.00	1.00	0.18	0.38	306	0.00	1.00	0.28	0.45
HEI D/H	211	0.00	1.00	0.36	0.48	306	0.00	1.00	0.12	0.32

Table 32a–b. Correlation matrixes of the regression variables

a)	<i>Estonia</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	17	18	19	20	21	
1	Employability	1.00																				
2	Intrap. II	0.33*	1.00																			
3	Intrap. I	0.34*	-0.16	1.00																		
4	Early-stage EA	0.22*	0.21	0.37	1.00																	
5	Cognitive outcomes	0.08	0.09	0.10	0.16*	1.00																
6	Skill-based outcomes	0.15	0.18	0.14*	0.19*	0.51*	1.00															
7	Affective outcomes	0.41*	0.29*	0.18*	0.32*	0.39*	0.42*	1.00														
8	Prior knowledge	0.28*	0.20	0.03	0.24*	0.00	-0.10	0.18*	1.00													
9	E-ship experience	0.37*	0.27*	0.11	0.27*	-0.03	-0.01	0.26*	0.61*	1.00												
10	Work experience	0.35*	-0.04	0.20*	0.15*	0.03	0.04	0.14*	0.30*	0.40*	1.00											
11	Ent.proclivity	0.2*	0.20	-0.07	0.39*	0.37*	0.27*	0.55*	0.23*	0.22*	0.09	1.00										
12	Mng proclivity	0.21*	0.17	0.08	0.20*	0.2*	0.18*	0.48*	0.25*	0.27*	0.19*	0.65*	1.00									
13	Entrep network	0.36*	0.12	0.10	0.18*	0.01	0.05	0.24*	0.21*	0.17*	0.11	0.18*	0.24*	1.00								
14	Past intrap.	0.41*	0.36*	0.46*	0.25*	0.01	0.08	0.21*	0.22*	0.34*	0.28*	0.07	0.25*	0.06	1.00							
16	Female	-0.24*	0.02	-0.06	-0.20*	0.04	0.03	-0.21*	-0.21*	-0.22*	-0.15*	-0.20*	-0.24*	-0.03	-0.23*	1.00						
17	Parent-entrep.	-0.04	-0.04	-0.13	-0.10	-0.04	-0.02	0.06	0.05	0.08	-0.16*	0.10	0.05	0.06	-0.12	-0.08	1.00					
18	Parent-mng.	-0.01	-0.02	-0.06	-0.04	-0.03	-0.03	0.11	0.14*	0.09	-0.08	0.14*	0.13	0.16*	-0.04	-0.08	0.27*	1.00				
19	Age	0.24*	0.11	0.16*	0.08	-0.08	0.05	-0.04	0.17*	0.33*	0.55*	-0.07	0.01	0.13	0.24*	-0.02	0.23*	0.15*	1.00			
20	Graduate	-0.02	0.06	-0.01	0.09	-0.01	-0.05	-0.04	-0.06	-0.15*	-0.13	-0.01	-0.03	0.08	0.05	0.11	-0.03	0.00	-0.02	1.00		
21	Doing MA	0.01	0.18	0.00	0.03	0.08	-0.01	-0.01	0.06	-0.03	-0.09	-0.02	0.07	0.19*	0.02	0.00	0.04	0.16*	0.18*	0.38*	1.00	

Notes: *Pearson correlation is significant at the 0.05 level (2-tailed). HEI-dummies and intervention type are excluded from this matrix.

b)	<i>Latvia</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	17	18	19	20	21
1	Employability	1																			
2	Intrap. II	0.46*	1.00																		
3	Intrap. I	0.20*	-0.03	1.00																	
4	Early-stage EA	0.19*	0.16	0.013	1.00																
5	Cognitive outcomes	0.12	0.13	0.003	-0.09	1.00															
6	Skill-based outcomes	0.11	0.18	-0.003	-0.01	0.58*	1.00														
7	Affective outcomes	0.39*	0.28*	0.11	0.29*	0.12*	0.22*	1.00													
8	Prior knowledge	0.22*	-0.002	0.06	0.11	0.07	0.03	0.12*	1.00												
9	E-ship experience	0.33*	0.19*	0.07	0.17*	-0.03	-0.04	0.10	0.4*	1.00											
10	Work experience	0.30*	0.13	0.13*	0.20*	-0.01	-0.03	0.08	0.28*	0.42	1.00										
11	Ent. proclivity	0.24*	0.13	0.06	0.31*	0.10	0.13*	0.46*	0.17*	0.15*	0.11*	1.00									
12	Mng proclivity	0.12	-0.14	0.06	0.03	0.03	0.01	0.22*	0.15*	0.00	0.12*	0.25*	1.00								
13	Network	0.36*	0.39*	0.07	0.22*	0.18*	0.13*	0.27*	0.29*	0.26*	0.18*	0.19*	0.09	1.00							
14	Past intrap.	0.4*	0.34*	0.43*	0.10	0.04	0.02	0.17*	0.11	0.20*	0.19*	0.06	-0.08	0.17*	1.00						
16	Female	-0.07	-0.06	-0.10	-0.13*	0.07	0.11*	-0.12*	-0.03	-0.06	-0.02	-0.15*	0.03	0.02	-0.09	1.00					
17	Parent-entrep.	0.18*	0.18	-0.09	0.12*	-0.03	-0.03	0.14*	0.13*	0.12*	0.02	0.06	0.00	0.24*	0.01	-0.08	1.00				
18	Parent-mng.	0.16*	0.15	0.05	0.13	-0.02	-0.04	0.13*	0.10	0.11	0.08	0.07	0.18*	0.15*	0.07	-0.03	0.43*	1.00			
19	Age	0.19*	-0.004	0.13*	0.07	0.01	-0.03	0.01	0.14*	0.22*	0.4*	0.11*	0.08	0.07	0.18*	-0.02	-0.15*	-0.15*	1.00		
20	Graduate	0.02	0.13	0.03	-0.03	0.18*	0.07	-0.05	-0.06	0.03	-0.03	-0.07	-0.03	0.00	0.12*	-0.05	0.01	-0.02	0.11	1.00	
21	Doing MA	-0.01	0.05	0.00	0.05	-0.01	-0.05	0.01	0.02	0.05	-0.01	-0.01	-0.09	0.04	0.09	0.02	-0.01	0.04	0.11	0.32*	1.00

Notes: *Pearson correlation is significant at the 0.05 level (2-tailed). HEI-dummies and intervention type are excluded from this matrix.

None of the correlations was specifically high (all below 0.7) and many were significant. Surprisingly, the highest coefficient ($r=0.65$) in the Estonian sample was found between the prior entrepreneurial and managerial proclivities, which could mean that for the Estonian students these were two interchangeable career scenarios. In the Latvian sample, it was the correlation between the cognitive and skill-based outcomes ($r=0.58$). Employability was significantly inter-related with the three other dependent variables in both samples, even with the private early-stage EA. More descriptive information on the graduate enterprises is to accompany the regressions of the private early-stage EA.

1) *Employability*

Most of the Estonian and Latvian graduates were employed as specialists and professionals; 15–20% held positions in middle management and about the same number worked as office clerks. Imminent graduates in several cases worked as skilled manual workers too. Table 33 provides the relevant figures.

Table 33. Types of paid employment among the Estonian and Latvian graduates

<i>Type of paid employment</i>	Estonia (N=157)	Latvia (N=235)
Professional (accountant, consultant, lawyer)	30	80
General management, director, top management	5	14
Middle management	27	48
Civil servant	6	10
Specialist	56	73
Office clerk	23	39
Skilled manual worker	12	10
Other	8	9

A stepwise multiple linear regression was run to predict employability from the learning outcomes with a set of control variables. Tables 34a–b present the findings in four steps. The baseline model puts forward socio-demographic control variables. In Model 2, prior knowledge, experience and proclivities are added. The third model gives special treatment to intrapreneurial activities in the past and the volume of entrepreneurial network. The independent effect of the learning outcomes was tested in Model 4. The change in explanatory power (ΔR^2) between the models was significant at a 1% level as the F-test indicated.

Tables 34a–b. Effects of the learning outcomes on graduate employability

<i>a) Estonian sample</i>	<i>Dependent variable: Employability</i>							
	Model 1		Model 2		Model 3		Model 4	
<i>Independent variables:</i>	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Parent-entrepreneur	-0.129	0.757	-0.302	0.717	-0.139	0.681	-0.199	0.659
Parent-manager	-0.178	0.804	-0.424	0.748	-0.418	0.709	-0.315	0.694
Gender	-2.096**	0.724	-0.753	0.707	-0.953	0.673	-0.827	0.663
Age	1.170**	0.420	0.179	0.460	0.026	0.438	0.169	0.435
Graduate status	0.171	0.722	0.767	0.687	0.583	0.653	0.596	0.639
Doing MA	0.763	1.061	0.136	0.982	-0.592	0.948	-0.412	0.936
Prior knowledge			0.220	0.460	-0.120	0.444	-0.047	0.434
Prior e-ship experience			0.818	0.494	0.795 ⁺	0.469	0.775 ⁺	0.464
Prior work experience			0.923*	0.406	0.818*	0.386	0.793*	0.374
Entrep. proclivity			0.612 ⁺	0.340	0.409	0.326	-0.009	0.350
Managerial proclivity			-0.311	0.345	-0.341	0.327	-0.493	0.320
Past intrapreneurship			2.447***	0.745	2.675***	0.709	2.255***	0.702
Entrep. network					1.203***	0.291	0.993***	0.289
Cognitive outcomes							0.018	0.349
Skill-based outcomes							0.045	0.361
Affective outcomes							2.614***	0.788
(Constant)	-0.814	1.141	-4.316	1.574	-5.802	1.536	-3.681	1.614
N	157		157		157		157	
F-value	3.050		4.999		6.443		6.408	
p-level	0.008		0.000		0.000		0.000	
R ²	0.109		0.294		0.369		0.423	
ΔR ²	0.109**		0.185***		0.075***		0.053**	
adj. R ²	0.073		0.235		0.312		0.357	

Notes: +p<0.10; *p<0.05; **p<0.01; ***p<0.001.

In the Estonian sample, in the baseline model we see that being a female had a considerable decreasing effect on graduate employability, while being older logically had a positive effect. In the second model, however, the socio-demographic variables were no longer significant with the prior work experience and past intrapreneurship overtaking the positive effects. Involvement in nascent intrapreneurial activities in the past considerably increased employability. These

variables remained significant when the entrepreneurial network entered the third model also levelling the dependent variable. Finally, of the three learning outcome types, only the affective outcomes stood out increasing the composite by 1.86 units.

<i>b) Latvian sample</i>	<i>Dependent variable: Employability</i>							
	Model 1		Model 2		Model 3		Model 4	
<i>Independent variables:</i>	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Parent-entrepreneur	1.323**	0.604	0.873	0.549	0.527	0.549	0.516	0.537
Parent-manager	1.305**	0.584	0.536	0.547	0.552	0.536	0.512	0.523
Gender	-0.406	0.534	0.118	0.484	-0.031	0.477	-0.021	0.469
Age	1.698***	0.448	0.506	0.444	0.537	0.435	0.609	0.423
Graduate status	0.099	0.610	0.217	0.559	0.166	0.548	0.127	0.541
Doing MA	-0.502	0.764	-0.712	0.688	-0.789	0.675	-0.729	0.659
Prior knowledge			0.075	0.348	-0.141	0.348	-0.135	0.340
Prior e-ship experience			0.910*	0.351	0.797*	0.346	0.866*	0.338
Prior work experience			0.564+	0.299	0.530+	0.293	0.558+	0.285
Entrep. proclivity			0.404+	0.212	0.325	0.209	-0.080	0.228
Managerial proclivity			0.346	0.270	0.298	0.265	0.155	0.261
Past intrapreneurship			3.135***	0.546	2.862***	0.542	2.452***	0.538
Entrep.network					0.647**	0.204	0.496*	0.204
Cognitive outcomes							0.178	0.287
Skill-based outcomes							0.016	0.286
Affective outcomes							1.864***	0.499
(Constant)	-3.273	0.929	-6.432	1.305	-6.765	1.283	-4.406	1.381
N	235		235		235		235	
F-value	4.369		8.284		8.736		8.512	
p-level	0.000		0.000		0.000		0.000	
R ²	0.103		0.309		0.339		0.385	
ΔR ²	0.103***		0.206***		0.030**		0.045**	
adj. R ²	0.080		0.272		0.301		0.339	

Notes: +p<0.10; *p<0.05; **p<0.01; ***p<0.001.

In the Latvian sample, the baseline model returned three variables positively influencing employability: age with an even higher B-coefficient (1.7), and having a parent-manager or a parent-entrepreneur. Prior experience in entrepreneurship, past intrapreneurship and network that entered the second and third models retained

their effects in Model 4. Prior work and entrepreneurship experience “exchanged roles” in this regression in the two samples. The latter was significant on the 10% level in the Estonian sample and the 5% level here ($B=0.87$), while the reverse was true for the former. One unit of increase in prior work experience raised the dependent variable by 0.56 yet on the 10% level (remaining through Model 2 to Model 4). In the final model, only the affective outcomes were once again associated with the positive change in graduate employability ($B=1.86$).

A deeper investigation into the affective outcome composite revealed it is the creative attitude and self-confidence that made this difference: $B=1.289$, $p<0.004$ in Estonia and $B=1.229$, $p<0.000$ in Latvia. Its consistent significance in both samples logically feeds into the paid employment demands better than the other components that are more entrepreneurially oriented. Although using the cross-sectional design, we do not know for certain that this component levelled up as a result of the intervention; comparison of the component means between entrepreneurship and non-entrepreneurship graduates suggested it was still slightly higher in the former group (at least in Latvia). Moreover, knowing that prior proclivity determined the level of creative attitude and self-confidence among Estonian and Latvian graduates, we can also notice that this variable behaves similarly in the regressions. At first, it shows the 10% level significance that, however, fades away in Model 3 when “network” is added. Further, in Model 4, its B-coefficient becomes negative once the highly significant affective outcomes enter the regression.

There were no fully overlapping confidence intervals in the final model. The largest overlap was about 1/3 in the Estonian sample and 1/4 in the Latvian sample between the past entrepreneurship and affective outcome intervals suggesting the significance of these variables should be less in practice (Cumming and Finch 2005). Therefore, the related hypotheses are supported but not strongly supported.

The same regressions were run using the weighted employability composite as a dependent variable. The aforementioned predictors behaved identically in both countries, if not counting prior entrepreneurship experience whose effect was non-significant in the Estonian sample. Also, the standard errors of the estimates were less in these regressions (see Annex 20 for the details).

2) *Nascent intrapreneurship I and II*

The dependent variables captured individuals who were involved in venture, subsidiary, product or service creation for an employer at the moment of the survey. There were 43 and 88 respective individuals in the samples. Most of them were developing new product or service lines. In the Estonian sample, only 4 out of 43

were dealing with new ventures or subsidiaries; in the Latvian sample, 27 out of 88.

Let us commence with the binary logistic regression run to predict the likelihood of nascent intrapreneurial activity among the graduates. Again, a stepwise method was used to estimate this, making it possible to track changes in R^2 and include meaningful variables in the models. Tables 35a–b present the key findings on nascent intrapreneurship I with the most optimal set of predictors. They report Exp(B) instead of B-coefficients, because changes in the log odds are more intuitive and easier to interpret in the logit regressions. Age was not included in the list of independent variables due to its non-significance despite the acknowledged correlation with the dependent variable.

Tables 35a–b. Effects of learning outcomes on nascent intrapreneurship I

<i>a) Estonian sample</i>	<i>Dependent variable: Nascent intrapreneurship I</i>				
	Model 1	Model 2	Model 3	Model 4	
<i>Independent variables:</i>	Exp(B)	Exp(B)	Exp(B)	Exp(B)	95% C.I.
Gender	0.702	0.738	1.387	1.528	[0.568; 4.114]
Parent-entrepreneur	0.450 ⁺	0.537	0.646	0.666	[0.251; 1.769]
Parent-manager	0.736	0.830	0.880	1.046	[0.390; 2.804]
Graduate status	1.055	1.222	0.911	0.927	[0.386; 2.227]
Prior work experience		1.677**	1.298	1.356	[0.852; 2.159]
Entrep.proclivity		0.822	0.768	0.491**	[0.316; 0.763]
Past intrapreneurship			11.225***	15.775***	[5.777; 43.074]
Cognitive outcomes				1.578	[0.909; 2.739]
Skill-based outcomes				1.248	[0.752; 2.070]
Affective outcomes – attitude to risk/failure				2.155**	[1.317; 3.527]
(Constant)	0.418	0.272	0.155	0.371	
Events/N	43/210	43/210	43/210	43/210	
Chi-square (χ^2)	6.002	14.568	47.651	65.714	
degrees of freedom	4	6	7	10	
p-level	0.199	0.024	0.000	0.000	
Cox & Snell R^2	0.028	0.067	0.203	0.269	
Nagelkerke R^2	0.045	0.106	0.321	0.425	
PAC	80%	79.5%	83.8%	86.2%	
Sensitivity	0%	0%	42.9%	47.6%	
Specificity	100%	99.4%	94.0%	95.8%	
PPV	-	-	64.3%	74.0%	
NPV	-	-	86.8%	87.9%	

Notes: + $p < 0.10$; ** $p < 0.01$; *** $p < 0.001$; PAC – percentage of accuracy in classification, sensitivity – % of cases that had the observed characteristic, specificity – % of cases that did not have the observed characteristic, PPV – positive predicted value (% of correctly predicted cases with the observed characteristic), NPV – negative predicted value (% of correctly predicted cases without the observed characteristic).

The baseline model had four socio-demographic control variables to which prior work experience and entrepreneurial proclivity were added in Model 2. Past intrapreneurship entered Model 3. This variable deserved special attention because even more respondents indicated that they took part in nascent intrapreneurial activities in the past than at the moment of the survey in the Estonian sample ($N=62$, 17 of which concerned new ventures or subsidiaries), and nearly the same number of respondents in the Latvian sample ($N=78$, 20 concerned new ventures or subsidiaries). Finally, the learning outcomes were introduced in Model 4. Model fit improved together with the R-square as the variables were sequentially added to the regression (it is more common to refer to Nagelkerke R^2 , however, as a modification of Cox and Snell R^2). Tables 35a–b also provide other metrics usually reported in conjunction with the logit regressions, such as the percentage of accuracy in classifications, sensitivity, specificity, positive and negative predicted value.

Of the 10 predictor variables, only 3 were statistically significant. In both samples, those who had past nascent intrapreneurial experience were 16 and 8 times more likely to be engaged in the nascent intrapreneurship at present in Estonia and Latvia, accordingly. Furthermore, this variable fully mediated the effect of prior work experience on the dependent variable. Prior entrepreneurial proclivity this time decreased the odds of involvement in nascent intrapreneurship twice (an inverted ratio of 1/0.491) in the Estonian sample. In turn, the odds of becoming a nascent intrapreneur were 2.4 times greater for those who did not have a parent-entrepreneur in the Latvian sample.

Among the three types of learning outcomes, only the affective outcomes proved positively significant. Separate tests with the composite's measures revealed that the attitude to risk and failure in the Estonian sample and the affection for entrepreneurship in the Latvian sample were the significant components in predicting nascent intrapreneurship I. One unit of increase in the attitude to risk and failure doubled the likelihood of the target activity; increasing affection raised the odds ratio by 1.6. Indeed, if controlled for the attitude to risk and failure the correlation between the dependent variable and prior proclivity was significantly negative in Estonia ($r=-0.154$, $p<0.026$), whereas attitude to risk and failure mitigated prior proclivity, most likely as a result of EE. In Latvia, having a parent-entrepreneur was negatively related to nascent intrapreneurship, either uncontrolled ($r=-0.086$, $p<0.132$) or controlled for affection towards entrepreneurship ($r=-0.109$, $p<0.058$) in spite of being positively related to affection. Therefore, the direct effect of having a parent-entrepreneur on the dependent variable was negative, while the indirect effect was positive.

<i>b) Latvian sample</i>	<i>Dependent variable: Nascent intrapreneurship I</i>				
	Model 1	Model 2	Model 3	Model 4	
<i>Independent variables:</i>	Exp(B)	Exp(B)	Exp(B)	Exp(B)	95% C.I.
Gender	0.629 ⁺	0.651	0.692	0.717	[0.402; 1.281]
Parent-entrepreneur	0.511 [*]	0.510 [*]	0.475 [*]	0.424 [*]	[0.216; 0.835]
Parent-manager	1.624 ⁺	1.548	1.451	1.474	[0.789; 2.752]
Graduate status	1.155	1.201	0.911	0.914	[0.497; 1.679]
Prior work experience		1.315 [*]	1.123	1.138	[0.839; 1.544]
Entrep.proclivity		1.074	1.054	0.869	[0.649; 1.165]
Past intrapreneurship			8.170 ^{***}	8.442 ^{***}	[4.433; 16.079]
Cognitive outcomes				0.966	[0.679; 1.376]
Skill-based outcomes				0.973	[0.688; 1.376]
Affective outcomes – affection				1.557 [*]	[1.093; 2.218]
(Constant)	0.462	0.257	0.228	0.439	
Events/N	88/305	88/305	88/305	88/305	
Chi-square (χ^2)	8.770	13.539	60.015	66.292	
degrees of freedom	4	5	7	10	
p-level	0.067	0.036	0.000	0.000	
Cox & Snell R ²	0.028	0.043	0.179	0.195	
Nagelkerke R ²	0.041	0.062	0.255	0.279	
PAC	71.1%	69.8%	77.7%	78.7%	
Sensitivity	0%	4.5%	47.7%	46.6%	
Specificity	100%	96.3%	89.9%	91.7%	
PPV	-	33.3%	65.6%	69.5%	
NPV	-	71.3%	80.9%	80.9%	

Notes: ⁺p<0.10; ^{*}p<0.05; ^{***}p<0.001; PAC – percentage of accuracy in classification, sensitivity – % of cases that had the observed characteristic, specificity – % of cases that did not have the observed characteristic, PPV – positive predicted value (% of correctly predicted cases with the observed characteristic), NPV – negative predicted value(% of correctly predicted cases without the observed characteristic).

Another closely related part of nascent intrapreneurial activity, involvement in idea development and implementation phases and taking an active or supporting role in them, was regressed linearly using eight predictors. The dependent variable captured the same individuals as in the preceding logistic regression as they took part in the tested phases. Tables 36a–b outline the results.

The baseline factors in the first model were limited to age, gender and graduate status. Past intrapreneurship and entrepreneurial network were added to the second model raising its explanatory power. In the Latvian sample, two of these predictors could be associated with a considerable increase in the dependent variable; in the Estonian sample, only past intrapreneurship, which also overtook the effect of age, is visible in the baseline model. This pattern persisted in Model 3, when the effect

of the learning outcomes was tested. The key variables did not improve the coefficient of the determination a lot – in both samples, the change in R^2 was negligent. However, one unit of increase in the skill-based outcomes could be associated with an increase in the dependent variable by 0.24 units at a 10% level of significance ($p < 0.057$) in the Latvian sample. In the Estonian sample, being a nascent intrapreneur in the past increased current nascent intrapreneurship by 0.83 units ($p < 0.05$). Regression Model 3 in this sample is non-significant. One might doubt whether the lower number of observations affected the result. Yet, running the same models using six variables (excluding gender and network) returns exactly the same result except that the F-test of the first and final model starts approaching the 5% level of significance, and the second model hits the 5% level.

Tables 36a–b. Effects of learning outcomes on nascent intrapreneurship II

<i>a) Estonian sample</i>	<i>Dependent variable: Nascent intrapreneurship II</i>					
	Model 1		Model 2		Model 3	
<i>Independent variables:</i>	B	S.E.	B	S.E.	B	S.E.
Gender	0.226	0.305	0.216	0.295	0.150	0.316
Age	0.374*	0.176	0.276	0.174	0.256	0.178
Graduate status	0.335	0.308	0.046	0.321	-0.054	0.348
Past intrapreneurship			0.737*	0.318	0.825*	0.362
Entrep.network			-0.013	0.154	-0.088	0.168
Cognitive outcomes					0.068	0.178
Skill-based outcomes					0.081	0.163
Affective outcomes					0.314	0.378
(Constant)	-1.166	0.474	-1.235	0.699	-1.019	0.719
N	43		43		43	
F-value	1.812		2.269		1.724	
p-level	0.161		0.068		0.128	
R^2	0.122		0.235		0.289	
ΔR^2	0.122		0.112 ⁺		0.054	
adj. R^2	0.055		0.131		0.121	

Notes: + $p < 0.10$; * $p < 0.05$.

Prior knowledge, entrepreneurial experience and aspirations were not presented in this regression to comply with the rule of thumb in relating the number of predictors to the number of observations (in the Estonian sample, the lenient version of five observations per predictor was followed). If these variables were included, their effect would be non-significant.

<i>b) Latvian sample</i>	<i>Dependent variable: Nascent intrapreneurship II</i>					
	Model 1		Model 2		Model 3	
<i>Independent variables:</i>	B	S.E.	B	S.E.	B	S.E.
Age	-0.068	0.169	-0.154	0.148	-0.145	0.148
Gender	-0.112	0.225	-0.190	0.198	-0.167	0.198
Graduate status	0.231	0.237	0.002	0.211	-0.013	0.211
Past intrapreneurship			0.724***	0.200	0.778***	0.208
Entrep.network			0.286**	0.083	0.237**	0.088
Cognitive outcomes					-0.102	0.121
Skill-based outcomes					0.240 ⁺	0.124
Affective outcomes					0.229	0.247
(Constant)	-0.015	0.320	-0.790	0.322	-0.722	0.328
N	88		88		88	
F-value	0.472		6.212		4.816	
p-level	0.702		0.000		0.000	
R ²	0.017		0.275		0.328	
ΔR^2	0.017		0.258***		0.053	
adj. R ²	-0.019		0.230		0.260	

Notes: +p<0.10; **p<0.01; ***p<0.001.

3) *Private early-stage EA*

Private early-stage EA captured individuals either taking active steps towards starting a new enterprise (nascent entrepreneurs), owned a new enterprise that was less than 3.5 years old or were self-employed professionals.

In the Estonian sample, out of the 57 cases of involvement, 39 were self-employed and 26 were nascent entrepreneurs:

- 22 were professionals with or without employed staff, 22 were owner-managers or co-owners of a young enterprise, 3 were owners of several new enterprises, but 1 marked “other” not specifying what type of self-employment she had; hence, 9 responses came from both professionals and new company owners;
- 8 self-employed individuals were also taking active steps towards starting a new company, thus 18 were nascent entrepreneurs only;
- 39 and 18 added up to 57 target observations.

In the Latvian sample, out of 98 cases of involvement, 39 were self-employed and 72 were nascent entrepreneurs:

- 25 were professionals with or without employed staff, 16 were owner-managers or co-owners of a young enterprise, 2 were owners of several new enterprises, but 1 marked “other” not specifying what type of self-employment she had; hence, 5 responses came from both professionals and new company owners;

- 13 self-employed individuals were also taking active steps towards starting a new company, thus 59 were nascent entrepreneurs only that amounts to 60% of those involved in private early-stage EA – twice more than in the Estonian sample;
- 39 and 59 added up to 98 target observations.

Half of the self-employed professionals in both samples were freelancers, the other half were contractors or subcontractors in existing companies. Six Estonian professionals employed staff ranging from 1 to 20 people, and only 1 Latvian professional employed five people.

Referring to the NACE codes, the young companies specialised in diverse areas of operation:

<i>Economic activity of young enterprises</i>	Estonia	Latvia
Agriculture, forestry and fishing	1	1
Mining and quarrying	1	-
Manufacturing	2	-
Construction	2	1
Wholesale and retail trade	2	4
Accommodation and food service activities	2	-
Information and communication	2	4
Financial and insurance activities	2	2
Real estate	1	-
Professional, scientific and technical activities	1	1
Education	1	-
Human health and social work activities	1	-
Arts, entertainment and recreation	1	3
Other service activities	6	4
Activities of households as employers; undifferentiated goods and services.	1	-

They also tended to employ less than 4 people, yet few companies had over 10 but less than 50 employees:

<i>Number of employees</i>	Estonia	Latvia
1-2	12	9
3-4	4	4
5-6	3	1
7-10	4	1
11-20	1	1
21-50	1	1
Total	25	16

In Estonia 17 of 25 and in Latvia 9 out of 16 entrepreneurs reported that their enterprise(s) accounted a profit within the period of existence. The young entrepreneurs were even quite open about the annual turnover of their companies:

	Estonia	Latvia
<i>Turnover (EUR)</i>		
<20 000	11	7
20 000 – 50 000	3	1
50 001 – 100 000	2	3
100 001 – 200 000	2	3
500 001 – 1 000 000	1	-
5 000 001 – 10 000 000	2	-
No answer	3	-
Total	24	14

The small new enterprises whose turnover was below EUR 20 000 did not have high-growth aspirations tending to remain within a manageable size:

<i>Growth aspirations:</i>	Estonia	Latvia
to be as large as possible	8	6
to be of a size you can manage yourself or with a few employees	12	6
hard to say	5	4
Total	25	16

Yet, some of them still tried to be innovative in some shape or form:

<i>Level of innovation</i>	Estonia	Latvia
The enterprise introduced new or significantly improved:		
- goods or services to the market	8	9
- processes to supply or produce goods	4	2
- forms of organisation, business structures or practices aimed at internal efficiency and effectiveness	5	4
Other	2	0
None	9	5

The majority of new enterprises were launched either during bachelor studies or after the graduation:

New enterprise owners:	Estonia, N=25		Latvia, N=18	
<i>Enterprises –</i>				
1) established before graduation:		Years:		Years:
- during studies	10	2007-2013	8	2007-08, 2010-13
- before admission	4	1996, 2005, 2008	1	2001
2) established after graduation:	8	2011-2013	14	2010-2013
3) by serial entrepreneurs:	14	1996-2011	8	2008, 2010, 2012

This implies an extra option to test the association of interventions in entrepreneurship with private early-stage EA among graduates, not counting the few serial entrepreneurs who naturally create a disproportionately larger number of new enterprises⁷. Even if the young companies fail, they still contribute to the overall entrepreneurial activity in the region. The aforementioned figures prove that many companies survived in the short- and mid-term. Notwithstanding the fact that the European “hype” favouring entrepreneurship, the fiscal loosening and other government regulations that coincided with the reference period could also influence entrepreneurial activity among young people, the contribution of EE should be notable, if present as a first-order factor.

A stepwise logistic regression was performed to ascertain the effects of the learning outcomes on the likelihood that the graduates engage into private early-stage EA. Gender, parent-entrepreneur and graduate status comprised the baseline model (Model 1). Prior entrepreneurship and work experience, entrepreneurial proclivity and network were added to Model 2. Then the effects of the cognitive, skill-based and affective outcomes of EE were tested in Model 3. All the logistic regression models were statistically significant. The log odds can be found in Tables 37a–b.

Confidence intervals are displayed for Model 3, which explained 44.5% and 33.1% of the variance in the dependent variable in the Estonian and Latvian data, respectively. With every new step in the regression, the percentage of accuracy in the classification of cases improved. It is noteworthy that age (unlike graduate status) was significant in neither of the models confirming the absence of the correlative relationship, and therefore, this was not included in the regressions.

Of the three socio-demographic control variables, 2 affected the likelihood of engagement in private early-stage EA in the Estonian sample. Bachelor graduates had 2.7 times higher odds of exhibiting the target behaviour. Having a parent-entrepreneur in this case was associated with a considerable reduction in the likelihood of engaging in EA ($1/0.264=3.8$), similarly to the case of nascent intrapreneurship (I) in the Latvian sample.

Increasing prior entrepreneurship experience in the Estonian sample and increasing prior work experience in the Latvian sample were associated with the higher likelihood of exhibiting the target behaviour. Having higher entrepreneurial aspirations before the bachelor studies also increased the odds significantly in both countries. In addition, personal entrepreneurial network had a positive effect in Latvia.

⁷ In Estonia, 2 serial entrepreneurs studied at HEI C, 1 at HEI D. In Latvia, 1 studied at HEI A and 1 at HEI B.

Tables 37a–b. Effects of learning outcomes on private early-stage EA

a) Estonian sample	Dependent variable: Private early-stage EA			
	Model 1	Model 2	Model 3	
Independent variables:	Exp(B)	Exp(B)	Exp(B)	95% C.I.
Gender	0.360**	0.517 ⁺	0.544	[0.239; 1.242]
Parent-entrepreneur	0.530 ⁺	0.251**	0.264**	[0.107; 0.650]
Graduate status	1.807 ⁺	2.628*	2.722*	[1.201; 6.170]
Prior e-ship experience		2.060**	2.213**	[1.333; 3.674]
Prior work experience		0.975	0.948	[0.606; 1.484]
Entrep.proclivity		2.657***	1.942**	[1.245; 3.030]
Entrep.network		1.329	1.317	[0.905; 1.915]
Cognitive outcomes			0.970	[0.622; 1.513]
Skill-based outcomes			1.253	[0.783; 2.004]
Affective outcomes -- affection			2.108*	[1.180; 3.767]
(Constant)	0.601	0.004	0.008	
Events/N	57/210	57/210	57/210	
Chi-square (χ^2)	13.837	66.132	76.590	
degrees of freedom	3	7	10	
p-level	0.003	0.000	0.000	
Cox & Snell R ²	0.064	0.270	0.306	
Nagelkerke R ²	0.093	0.394	0.445	
PAC	74.3%	79.5%	81.4%	
Sensitivity	17.9%	50.8%	55.4%	
Specificity	94.8%	90.3%	90.9%	
PPV	55.5%	65.1%	68.9%	
NPV	76.0%	83.2%	84.8%	

Notes: + $p < 0.10$; ** $p < 0.01$; *** $p < 0.001$; PAC – % of accuracy in classification, sensitivity – % of cases that had the observed characteristic, specificity – % of cases that did not have the observed characteristic, PPV – positive predicted value (% of correctly predicted cases with the observed characteristic), NPV – negative predicted value (% of correctly predicted cases without the observed characteristic).

The aforementioned effects persisted in Model 3. Similarly to employability and nascent intrapreneurship, only affective outcomes, affection for entrepreneurship to be precise, acted as a significant predictor. Increasing affection was associated with the likelihood of becoming an early-stage entrepreneur being twice as high in both countries. However, better gains in cognitive learning; that is, increasing knowledge about entrepreneurship as a result of EE, reduced the odds of engaging in EA among the Latvian graduates, contrary to the initial expectations.

In terms of the confidence intervals, quite a number of them overlapped in this regression in both samples. In particular, the intervals for prior entrepreneurial career aspirations fully overlapped with a slightly wider interval for prior experience in entrepreneurship in the Estonian sample. Both of them were

“covered” by the interval of affection, which in turn had a large zone of overlap with graduate status. In the Latvian sample, this issue concerned only the control variables, yet how similar their confidence intervals (and slopes) are is noteworthy.

<i>b) Latvian sample</i>	<i>Dependent variable: Private early-stage EA</i>			
	Model 1	Model 2	Model 3	
<i>Independent variables:</i>	Exp(B)	Exp(B)	Exp(B)	95% C.I.
Gender	0.569*	0.620 ⁺	0.666	[0.374; 1.184]
Parent-entrepreneur	1.717*	1.474	1.220	[0.678; 2.198]
Graduate status	0.806	0.860	0.974	[0.540; 1.755]
Prior e-ship experience		1.059	1.021	[0.691; 1.509]
Prior work experience		1.437*	1.492*	[1.069; 2.081]
Entrep.proclivity		1.809***	1.370*	[1.003; 1.872]
Entrep.network		1.309*	1.389*	[1.078; 1.790]
Cognitive outcomes			0.626*	[0.437; 0.896]
Skill-based outcomes			1.119	[0.792; 1.580]
Affective outcomes -- affection			2.262***	[1.530; 3.344]
(Constant)	0.593	0.020	0.039	
Events/N	98/304	98/304	98/304	
Chi-square (χ^2)	10.643	55.780	82.061	
degrees of freedom	3	7	10	
p-level	0.014	0.000	0.000	
Cox & Snell R ²	0.034	0.168	0.237	
Nagelkerke R ²	0.048	0.235	0.331	
PAC	67.4%	71.7%	75.7%	
Sensitivity	6.2%	35.1%	47.4%	
Specificity	96.1%	88.9%	88.9%	
PPV	42.9%	59.6%	66.7%	
NPV	68.6%	74.5%	78.3%	

Notes: + $p < 0.10$; ** $p < 0.01$; *** $p < 0.001$; PAC – % of accuracy in classification, sensitivity – % of cases that had the observed characteristic, specificity – % of cases that did not have the observed characteristic, PPV – positive predicted value (% of correctly predicted cases with the observed characteristic), NPV – negative predicted value (% of correctly predicted cases without the observed characteristic).

4) Summing it up for H4–H6

All in all, these three analyses offer support for H4c, H5c, H6c in both countries. Graduate employability is positively dependent upon the affective outcomes of EE (the creative attitude and self-confidence component, in particular). Nascent intrapreneurship I is positively dependent upon attitude to risk and failure in the Estonian sample, and upon affection for entrepreneurship in the Latvian sample. Private early-stage EA is positively dependent on affection in both samples. H5b can be weakly and partly supported – based on Latvian data – although we should

not exclude that this effect might be random. H4a–b, H5a, H6a–b did not find support as summarised in Table 38. The role of the cognitive and skill-based outcomes of EE in employability, nascent intrapreneurship and private early-stage EA among bachelor graduates is therefore seriously questioned. In addition, despite the earlier acceptance of H2, or the indirect relationship between the cognitive and affective outcomes, the latter did not mediate associations between cognitive and skill-based outcomes and objective expressions of entrepreneurial behaviour.

Table 38. Results of testing H4–H6

No.	Hypothesis	Latvian sample		Estonian sample	
Employability					
H4a	<i>Graduate employability is positively dependent on the cognitive outcomes of EE.</i>	Not supported		Not supported	
H4b	<i>Graduate employability is positively dependent on the skill-based outcomes of EE.</i>	Not supported		Not supported	
H4c	<i>Graduate employability is positively dependent on the affective outcomes of EE.</i>	Supported		Supported	
Intrapreneurship (nascent, I and II)		Part I	Part II	Part I	Part II
H5a	<i>Nascent intrapreneurial activity of graduates is positively dependent on the cognitive outcomes of EE.</i>	Not supported		Not supported	
H5b	<i>Nascent intrapreneurial activity of graduates is positively dependent on the skill-based outcomes of EE.</i>	Not supported	Weakly supported	Not supported	
H5c	<i>Nascent intrapreneurial activity of graduates is positively dependent on the affective outcomes of EE.</i>	Supported	Not supported	Supported	Not supported
Entrepreneurial activity					
H6a	<i>The cognitive outcomes of EE increase the propensity of graduates to engage in private early-stage entrepreneurial activity.</i>	Not supported		Not supported	
H6b	<i>The skill-based outcomes of EE increase the propensity of graduates to engage in private early-stage entrepreneurial activity.</i>	Not supported		Not supported	
H6c	<i>The affective outcomes of EE increase the propensity of graduates to engage in private early-stage entrepreneurial activity.</i>	Supported		Supported	

7.3.5 Comparison of objective outcomes: testing H7

The seventh and last hypothesis in this study, akin to the third, is concerned with comparing the objective outcomes of EE in terms of the forms of intervention. To test H7a, there were over 20 observations on employability per HEI in each country; therefore, the original grouping was kept. To test H7b–c, the number of observations on nascent intrapreneurship and private early-stage EA per HEI was insufficient in the Estonian sample as seen in Table 39a–b below, and that is why grouping by form of intervention was used. In the regression of EA with the Latvian data, the findings were more meaningful with grouping by HEI.

Descriptive statistics for the dependent variables by HEI or form of intervention can be found in Table 40. The means are higher for HEI C in Estonia. In spite of the experiential interventions featuring higher nascent intrapreneurship means in the Latvian sample, it is HEI F but not G that leads in employability and early-stage EA.

Table 39a–b. Number of graduates involved in entrepreneurial and intrapreneurial activities per HEI

<i>a) Estonia</i>	Early-stage EA		Nascent intrap.		
	Yes/No	0	1	0	1
A (N=70)		54	19 (26%)	62	11 (15%)
B (N=25)		20	5 (20%)	22	3 (12%)
C (N=36)		24	13 (35%)	25	12 (32%)
D (N=71)		56	20 (26%)	59	17 (22%)
Total (211)		154	57 (27%)	168	43 (20%)

<i>b) Latvia</i>	Early-stage EA		Nascent intrap.		
	Yes/No	0	1	0	1
E (N=60)		41	19 (32%)	44	16 (27%)
F (N=123)		70	53 (43%)	84	39 (32%)
G (N=87)		73	14 (16%)	63	24 (28%)
H (N=36)		24	12 (33%)	27	9 (25%)
Total (306)		208	98 (32%)	218	88 (29%)

Table 41 outlines the results of Model 5 to which the schools were added as an extension of Model 4 in the multiple linear regression of employability (Tables 41a–b). In terms of the control variables, the significance of prior entrepreneurship and work experience lessened in the Estonian but not in the Latvian sample. Past intrapreneurship and entrepreneurial network retained its effects. One unit of increase in the affective outcomes was still associated with the increase of employability: by 2.7 units in Estonia and 1.9 units in Latvia. The B-coefficients for creative attitude and self-confidence that drove this effect would be equal to 1.4 and 1.2, respectively, if used in this model. More importantly, the Estonian graduates from the experiential HEI C were not statistically different from the graduates of other schools as far as employability was concerned. In turn, the Latvian graduates from the predominantly experiential HEI F had higher levels of employability than graduates from the most experiential HEI G.

Table 40. Descriptive statistics for the dependent variables by type of EE intervention

Dependent variable	HEI/intervention type	<i>Estonia</i>			<i>Latvia</i>		
		N	Mean	SD	N	Mean	SD
Employability (equal weights)	HEI A/E	49	-0.38	4.5	45	-0.79	5.0
	HEI B/F	19	0.03	4.3	93	0.93	3.7
	HEI C/G	27	1.03	4.3	72	-1.02	4.4
	HEI D/H	62	-0.09	4.2	26	-0.19	3.1
Nascent intrapreneurship I	Traditional	174	0.18	0.4	96	0.26	0.4
	Experiential	37	0.32	0.5	210	0.30	0.5
Nascent intrapreneurship II	Traditional	31	-0.25	0.9	25	-0.33	1.1
	Experiential	12	0.21	0.9	63	0.11	0.9
Private early-stage EA	Traditional	174	0.25	0.4	-	-	-
	Experiential	37	0.35	0.5	-	-	-
	HEI E	-	-	-	60	0.32	0.5
	HEI F	-	-	-	123	0.43	0.5
	HEI G	-	-	-	87	0.16	0.4
	HEI H	-	-	-	36	0.33	0.5

The control regressions using the weighted employability composite yielded similar results, except for extra effects within the 10% level from the two control variables: prior managerial proclivity in the Estonian sample and doing an MA in the Latvian sample (see Annex 20). In addition, the p-value of HEI F exceeded 0.05 in this regression ($p < 0.063$ as compared to $p < 0.047$ when equal weights were assumed). Nevertheless, this does not affect the conclusion on H7a.

Table 41. Effects of intervention type/HEI on graduate employability

<i>Independent variables:</i>	<i>Dependent variable: Employability</i>					
	Model 5: Estonia			Model 5: Latvia		
	B	S.E.	C.I.	B	S.E.	C.I.
Parent-entrepreneur	-0.310	0.665	[-1.624; 1.005]	0.555	0.537	[-0.502; 1.613]
Parent-manager	-0.194	0.710	[-1.599; 1.211]	0.527	0.524	[-0.506; 1.560]
Gender	-0.643	0.674	[-1.976; 0.690]	-0.216	0.477	[-1.158; 0.725]
Age	0.274	0.444	[-0.604; 1.152]	0.603	0.441	[-0.266; 1.472]
Graduate status	0.408	0.654	[-0.885; 1.701]	0.532	0.601	[-0.653; 1.717]
Doing MA	0.091	1.012	[-1.911; 2.092]	-1.005	0.674	[-2.333; 0.324]
Prior knowledge	0.011	0.444	[-0.868; 0.889]	-0.128	0.342	[-0.802; 0.545]
Prior e-ship experience	0.706	0.466	[-0.216; 1.628]	0.911*	0.345	[0.230; 1.591]
Prior work experience	0.708 ⁺	0.384	[-0.051; 1.467]	0.483 ⁺	0.289	[-0.086; 1.052]
Entrep. proclivity	0.088	0.360	[-0.625; 0.801]	-0.200	0.235	[-0.663; 0.263]
Managerial proclivity	-0.542	0.329	[-1.192; 0.107]	0.143	0.262	[-0.373; 0.659]
Past intrapreneurship	2.524**	0.744	[1.052; 3.996]	2.347***	0.538	[1.286; 3.407]
Entrep.network	1.022**	0.295	[0.438; 1.605]	0.481*	0.203	[0.080; 0.881]
Cognitive outcomes	-0.042	0.352	[-0.738; 0.653]	-0.029	0.287	[-0.594; 0.537]
Skill-based outcomes	0.071	0.362	[-0.644; 0.786]	0.199	0.286	[-0.365; 0.762]
Affective outcomes	2.729**	0.792	[1.163; 4.295]	1.883***	0.497	[0.902; 2.863]
HEI A/E	0.039	0.928	[-1.796; 1.875]	0.178	0.726	[-1.254; 1.610]
HEI B/F	1.609	1.145	[-0.655; 3.874]	1.291*	0.620	[0.070; 2.512]
HEI D/H	0.813	0.907	[-0.982; 2.607]	1.065	0.928	[-0.763; 2.894]
(Constant)	-4.706	1.860		-4.631	1.382	
N	157			235		
F-value	5.558			7.543		
p-level	0.000			0.000		
R ²	0.435			0.400		
ΔR ²	0.013			0.015		
adj. R ²	0.357			0.347		

Notes: +p<0.10; *p<0.05; **p<0.01; ***p<0.001; HEIs C and G are the reference groups.

Table 42 presents results of the binary logistic regression of nascent intrapreneurship I, which extended Model 4 using form of intervention. All the previously salient variables persisted with their effects. Intervention type was non-significant once again in both samples. There were no differences between the Latvian HEIs in that respect either.

In the case of nascent intrapreneurship II, the multiple linear regressions brought slightly different results once intervention type was added to Model 4 (Table 43). In the Estonian sample, the new slope was not statistically different from zero; that is, the linear relationship between the intervention type and nascent intrapreneurship II was non-significant. Past intrapreneurship was significant at the

5% level as it was in Model 3 but remained within the 10% level. In the Latvian sample, the control variables and the skill-based outcomes had the same effects. Although there were no differences between the HEIs, regrouping by form of intervention brought weak support for H7b.

Table 42. Effects of intervention type on nascent intrapreneurship I

<i>Independent variables:</i>	<i>Dependent variable: Nascent intrapreneurship I</i>			
	<i>Model 5: Estonia</i>		<i>Model 5: Latvia</i>	
	<i>Exp(B)</i>	<i>95% C.I.</i>	<i>Exp(B)</i>	<i>95% C.I.</i>
Gender	1.488	[0.553; 4.000]	0.733	[0.409; 1.314]
Parent-entrepreneur	0.668	[0.251; 1.779]	0.422*	[0.214; 0.830]
Parent-manager	0.988	[0.364; 2.683]	1.472	[0.789; 2.748]
Graduate status	0.949	[0.391; 2.298]	0.890	[0.418; 1.561]
Prior work experience	1.393	[0.871; 2.228]	1.126	[0.837; 1.556]
Entrep.proclivity	0.471**	[0.299; 0.742]	0.873	[0.652; 1.187]
Past intrapreneurship	13.897***	[4.961; 38.930]	8.561***	[4.485; 16.339]
Cognitive outcomes	1.597	[0.913; 2.791]	0.971	[0.671; 1.376]
Skill-based outcomes	1.228	[0.740; 2.036]	0.965	[0.688; 1.389]
Affective outcomes – attitude to risk/failure (EST) affection (LV)	2.205**	[1.337; 3.634]	1.549*	[1.087; 2.207]
Intervention type	1.686	[0.575; 4.945]	1.235	[0.654; 2.331]
(Constant)	0.383		0.379	
Events/N	43/210		88/305	
Chi-square (χ^2)	66.607		66.720	
degrees of freedom	11		11	
p-level	0.000		0.000	
Cox & Snell R ²	0.272		0.196	
Nagelkerke R ²	0.430		0.281	
PAC	84.3%		78%	
Sensitivity	45.2%		46.6%	
Specificity	94.0%		90.8%	
PPV	65.5%		67.2%	
NPV	87.3%		79.5%	

Notes: **p<0.01; ***p<0.001; PAC – % of accuracy in classification, sensitivity – % of cases that had the observed characteristic, specificity – % of cases that did not have the observed characteristic, PPV – positive predicted value (% of correctly predicted cases with the observed characteristic), NPV – negative predicted value (% of correctly predicted cases without the observed characteristic).

Finally, the regression model of private early-stage EA brought the following results. The relationship of the dependent variable to intervention type was non-significant in both samples. In the Latvian sample, however, comparison by HEI with the most experiential HEI G used as a reference group yielded counter-

intuitive results at first sight that are presented in Table 44. The graduates from this school were 3–4 times less likely to engage in early-stage EA than graduates from the other three schools. However, this is well explicable using the initial career aspirations that were low among the graduates of HEI G, which was also confirmed during the interviews with their educators; in other words, EE did not change this pattern.

As for the control variables, they retained the status quo in the Estonian sample. In the Latvian sample, the HEI-dummies mediated the effect of prior proclivity because the initial differences between the schools were present in this respect. The counter-effect of being female on the odds of engaging in private early-stage EA strengthened along with the introduction of the HEI-variable for the same reason.

Table 43. Effects of intervention type on nascent intrapreneurship II

<i>Independent variables:</i>	<i>Dependent variable: Nascent intrapreneurship II</i>					
	Model 4: Estonia			Model 4: Latvia		
	B	S.E.	C.I.	B	S.E.	C.I.
Gender	0.114	0.329	[-0.556; 0.783]	-0.182	0.194	[-0.569; 0.205]
Age	0.284	0.190	[-0.102; 0.670]	-0.105	0.147	[-0.398; 0.187]
Graduate status	-0.020	0.359	[-0.751; 0.710]	-0.094	0.212	[-0.515; 0.327]
Past intrapreneurship	0.724 ⁺	0.423	[-0.137; 1.584]	0.809 ^{***}	0.205	[0.401; 1.218]
Entrep.network	-0.115	0.179	[-0.479; 0.250]	0.224 [*]	0.086	[0.052; 0.396]
Cognitive outcomes	0.046	0.186	[-0.332; 0.424]	-0.076	0.119	[-0.314; 0.162]
Skill-based outcomes	0.086	0.165	[-0.251; 0.422]	0.232 ⁺	0.122	[-0.011; 0.476]
Affective outcomes	0.292	0.385	[-0.491; 1.075]	0.205	0.243	[-0.279; 0.689]
Intervention type	0.199	0.414	[-0.643; 1.041]	0.421 ⁺	0.217	[-0.010; 0.853]
(Constant)	-0.972	0.733		-1.000	0.353	
N	43			88		
F-value	1.524			4.851		
p-level	0.181			0.000		
R ²	0.294			0.359		
ΔR ²	0.005			0.031 ⁺		
adj. R ²	0.101			0.285		

Notes: ⁺p<0.10; ^{*}p<0.05; ^{***}p<0.001.

To sum up, out of the three hypotheses on the association of experiential EE with objective outcomes of EE in the two countries, only H7b found weak support in the Latvian sample. In spite of the fact that based on the descriptive data, experiential EE could be associated with better objective outcomes, this was not the case in inferential terms as summarised in Table 45.

Table 44. Effects of intervention type on private early-stage EA

<i>Independent variables:</i>	<i>Dependent variable: Private early-stage EA</i>			
	<i>Model 4: Estonia</i>		<i>Model 4: Latvia</i>	
	<i>Exp(B)</i>	<i>95% C.I.</i>	<i>Exp(B)</i>	<i>95% C.I.</i>
Gender	0.544	[0.238; 1.243]	0.533*	[0.291; 0.978]
Parent-entrepreneur	0.265**	[0.108; 0.653]	1.345	[0.733; 2.469]
Graduate status	2.707*	[1.193; 6.142]	1.255	[0.650; 2.423]
Prior e-ship experience	2.220**	[1.336; 3.689]	1.113	[0.745; 1.664]
Prior work experience	0.949	[0.607; 1.485]	1.418*	[1.008; 1.994]
Entrep.proclivity	1.946**	[1.247; 3.036]	1.292	[0.939; 1.779]
Entrep.network	1.322	[0.908; 1.924]	1.375*	[1.061; 1.782]
Cognitive outcomes	0.963	[0.616; 1.505]	0.644*	[0.446; 0.929]
Skill-based outcomes	1.267	[0.788; 2.036]	1.081	[0.754; 1.550]
Affective outcomes -- affection	2.144*	[1.191; 3.862]	2.277***	[1.528; 3.395]
Intervention type (EST)	0.848	[0.330; 2.183]	-	
HEI E (LV)	-		3.010*	[1.166; 7.770]
HEI F (LV)	-		3.700**	[1.613; 8.487]
HEI H (LV)	-		3.641*	[1.145; 11.576]
(Constant)	0.008		0.018	
Events/N	57/210		98/304	
Chi-square (χ^2)	76.707		92.965	
degrees of freedom	11		13	
p-level	0.000		0.000	
Cox & Snell R ²	0.306		0.263	
Nagelkerke R ²	0.446		0.369	
PAC	81.0%		78.9%	
Sensitivity	55.4%		55.7%	
Specificity	90.3%		89.9%	
PPV	67.4%		72.0%	
NPV	84.8%		81.2%	

Notes: +p<0.10; **p<0.01; ***p<0.001; PAC – % of accuracy in classification, sensitivity – % of cases that had the observed characteristic, specificity – % of cases that did not have the observed characteristic, PPV – positive predicted value (% of correctly predicted cases with the observed characteristic), NPV – negative predicted value (% of correctly predicted cases without the observed characteristic).

Partial correlations, where the product-moment correlation coefficients between education and entrepreneurship-level outcomes were adjusted to take into account the significant control variables, brought about analogous findings. Calculated separately for the traditional and experiential groups, the coefficients for the pairs of skills and intrapreneurship, of knowledge and employability, of attitudes and all the objective outcomes were significant or approaching significance only in the former group in the Estonian sample. In the Latvian sample, affective and skill-based outcomes notably correlated with intrapreneurship in the

experiential group. It was also clarified that the significantly negative association of the cognitive outcomes and early-stage EA fell within the traditional group. On the whole, the experiential form of intervention was not consistently characterised by conspicuous correlational linkages between the two groups of the EE outcomes. Annex 21 provides the relevant figures.

Table 45. Results of testing H7

No.	Hypothesis	Latvian sample		Estonian sample
H7a	<i>Experiential EE is associated with higher levels of graduate employability.</i>	Not supported		Not supported
H7b	<i>Experiential EE is associated with higher levels of nascent intrapreneurial activity of graduates.</i>	Part I	Not supported	Not supported
		Part II	<i>Weakly supported</i>	
H7c	<i>Experiential EE is associated with higher likelihood of graduate engagement in private early-stage entrepreneurial activity.</i>	Not supported		Not supported

The obtained results are rather surprising and quite challenging for the current state of EE in Latvia and in Estonia. Does it really meet the expectations of educators, the management in HEIs, and policy makers? The learning measures are expected to have the greatest effect when there is congruence between learning objectives, instructional design, methods of assessment and learning environment (Ramsden 2003; Kraiger et al. 1993; Biggs 1999). Is the congruence really ensured and what might be the reasons as well as solutions for the findings in the analysed context? The results are also intriguing from the theoretical perspective questioning the widespread assumptions about EE. This are comprehensively discussed in the next chapter, which systematises and links the qualitative insights with the quantitative inferences, offers concrete recommendations and identifies the avenues for further research. The limitations of this study are also acknowledged and addressed.

8 CONCLUSIONS AND DISCUSSION

The belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative (Dewey 1998:13).

Entrepreneurship education research has increasingly recognised the importance of deepening the understanding of the outcomes of educational interventions. The underlying rationale behind this call consists in the solid bets and high expectations from EE on the part of policy makers, study programme leaders and educators as well as students, among other possible stakeholders. The widespread belief that educational efforts in entrepreneurship are capable of boosting societal and economic growth through increased entrepreneurial activity in its turn driven by the competences developed at the individual-level is close to indispensable. Despite the fact that this may well be true, the substantial body of research on the impact of EE has shed insufficient light on the links constituting the aforementioned logical chain, as well as on key factors of effective interventions. In particular, how the form of intervention – traditional versus experiential – conditioned by specifics of EE design and delivery relate to outcomes at the educational and entrepreneurship level, and how the coherence between the didactic, pedagogical and contextual choices of educators might affect these outcomes has remained underexplored. Further, the associations between the two groups of outcomes, one being competences formed as a result of EE and the other being objective expressions of entrepreneurial behaviour, were not widely researched by EE scholars. Finally, most studies of the impact of EE have relied on empirical material from developed, typically Anglo-Saxon, countries that might have led to over-generalising findings from these contexts. Against this backdrop, the current monograph sought to revisit the evaluation of the outcomes of EE by addressing the crucial gaps and to contribute to on-going academic debate with new theoretical, methodological and empirical insights.

In doing so, the monograph proposed and applied a novel integrative framework for evaluating the outcomes of EE. The framework put forward entrepreneurship

teaching models alongside the triad of entrepreneurial competences expressed as cognitive, skill-based and affective outcomes in the domain of education, and the triumvirate objective outcomes expressed as employability, intrapreneurship and private early-stage entrepreneurial activity in the domain of entrepreneurship. The application of the framework covered the specifics of EE design and delivery in the analysed countries, the questions of outcome evaluation and attainment of educational objectives as well as touching upon the effectiveness and efficiency of EE. In effect, the integrative framework served as a system of analysis of what worked, what did not and why in certain interventions. Targeted at the two main lines of falsifiable propositions that: a) *experiential EE is associated with higher levels of the learning and objective outcomes among graduates than traditional EE*, and b) *the objective outcomes of EE are positively dependent on the learning outcomes*, the study arrived at somewhat unexpected findings which are critically discussed with an attempt to explain them below.

8.1 Empirical findings and contributions

This study found empirical support for the hypothesis that experiential EE is associated with higher skill-based and affective outcomes than traditional EE, but only in Estonia. The analysis indicated that the experiential form of intervention does not necessarily lead to higher levels of perceived learning outcomes, in some cases even being associated with adverse effects; and that other factors, for example, prior entrepreneurial aspirations and attitudes to educators exhibit significant influence on these outcomes. In regard to prior aspirations, they played an instrumental role in the formation of learning outcomes. Graduates with high aspirations reported considerably better learning gains in perceived entrepreneurial knowledge and skills. However, graduates with low aspirations benefited more from affective learning. This extends and confirms the findings of Fayolle and Gailly (2013).

The linkages envisaged by the integrative framework also addressed the associations among the types of learning outcomes, whereas four hypotheses on the correlational and mediation relationships were supported in both samples. Therefore, the results provided empirical support for the assumption of hierarchical relationships between the types of learning outcomes as per Kraiger et al.'s (1993) and Fisher et al.'s (2008) adaptations of Bloom's original taxonomy (Krathwohl 2002), so that the relationship between cognitive and affective outcomes was mediated by skill-based outcomes. The validity of the tripartite competence

framework grounded in the science of education was also substantiated by means of structural equation modelling.

Regarding the associations between perceived learning outcomes and objective outcomes, affective outcomes (namely, creative attitude and self-confidence, affection, attitude to risk and failure) were found to act as consistent predictors of graduate employability, private early-stage EA as well as increasing the propensity of graduates to engage in nascent intrapreneurship. Another testable aspect of the latter of these entrepreneurship-level outcomes (involvement in idea development and implementation phases, taking an active or supporting role in them) revealed weak dependence on skill-based outcomes in the Latvian sample, but not in the Estonian sample. This measure of nascent intrapreneurial activity was also somewhat positively influenced by the experiential form of intervention in Latvia, unlike other entrepreneurship-level outcomes. In principle, as far as the objective expressions of entrepreneurial behaviour were concerned in the time frame of the research project, it did not matter significantly whether students studied entrepreneurship traditionally or experientially in Estonia; more experiential EE even tended to be less beneficial in terms of early-stage EA in Latvia. Moreover, none of the objective outcomes showed the expected dependency (positive and at the 95–99% confidence level) upon cognitive and skill-based learning outcomes. A number of control variables turned out to act as significant predictors, for example: prior work experience, entrepreneurial network in the case of employability, past intrapreneurship in the case of nascent intrapreneurship, prior experience in entrepreneurship or gender in the case of early-stage EA. These results were largely divergent from conventional wisdom within human capital theory, implying that investments in entrepreneurship-related human capital assets (i.e. competence development) do not quite meet the expected returns in the time frame of the research.

In total, nine out of nineteen hypotheses were supported with slight differences between Estonia and Latvia. Qualitative insights helped to unveil deeper reasons behind the obtained quantitative findings that tended to challenge the dominant assumptions and question the effectiveness and efficiency of EE. Furthermore, they provided extensive evidence on the profiles and current practices of entrepreneurship educators in the two countries, and demonstrated how diverse operational dimensions converge in the known teaching models, eventually the forms of EE interventions.

8.1.1 Constructs of learning outcomes

Based on the refined measures originally categorised by Fisher et al. (2008), the resulting constructs of learning outcomes captured a wider scope of constituents specific to EE than the entrepreneurial intentionality models alone. It is remarkable how the estimation results for knowledge and skills reflected some trends and differences in teaching entrepreneurship between Estonia and Latvia, as well as the transitioning understanding of the distinction between entrepreneurship and management in the Latvian academic circles captured in the qualitative study. The construct of perceived cognitive outcomes comprised more managerial than entrepreneurial items in Latvia, and the reverse was true for Estonia, apparently mirroring the study content. Such crucial entrepreneurial skills as “attracting investors to new endeavours”, “identifying and analysing risk”, “devising business models” and “developing new products and services” were purified when estimating perceived skill-based outcomes suggesting that they were not consistently developed among graduates in either country.

The composite of affective outcomes consisted of the six subscales: affection for entrepreneurship, creative attitude and self-confidence, need for achievement/ambitiousness, attitude to new learning, sense of self-reliance, and attitude to risk and failure where Chronbach's alphas ranged from 0.611 to 0.937. The very first sub-scale had the highest reliability indicator in both samples and comprised items representing a high degree of affection for entrepreneurship; that is, career aspirations, desirability to start-up, passion for entrepreneurship and self-efficacy. In spite of the established convergent and discriminant validity of the constructs, it might not be excessive to comment on the legitimacy of combining the items which are known to be causally related, according to the theory of planned behaviour, into one construct. Strictly speaking, the causality among a set of items does not contradict them measuring one thing, event or process; that is, making up a scale. In a similar vein, getting a PhD degree involves enrolling in a doctoral programme, getting a research proposal approved, passing compulsory theoretical courses, obtaining empirical data, and so on. Although completion of these steps is usually sequential, they are still directly related to a PhD degree, some of them having more weight than others (e.g. writing a thesis would carry the highest importance) but neither of them lead to the degree on its own. Therefore, using the scale of affection that has been validated in two countries, is highly reliable statistically and appears to be legitimate and appropriate for the purposes of this study.

The differences in the composition of cognitive outcomes eventually influenced the strength and significance of the relationships with affective outcomes in the two countries. The correlational relationship in the Latvian sample was weaker and attributable to attitude to risk and failure only, while in the Estonian sample every sub-scale of affective outcomes correlated with cognitive outcomes. The indirect relationship between the two, mediated by skill-based outcomes, also differed slightly in the absence of a direct effect in the Latvian sample for similar reasons. This demonstrates how differences in the content of a study programme can influence the composition of the outcome constructs and, hence, the relationships among them.

While there is no unity of scholarly opinions on the prioritisation of the outcomes evolution (Bloom et al. 1956; Kraiger et al. 1993) and, to the best of the author's knowledge, no empirical proofs of the hierarchical relationships between the learning outcome types in the EE research exist, there is room for discussion and statistical experiments. The stepwise relationship established in this study suggests that affective outcomes are more stable when they are formed on the basis of the consecutively developed entrepreneurial knowledge and skills. Technically, reverse causality would also hold, and supporting the second hypothesis in no way implies that affective learning does not influence knowledge formation, for instance, since all three types of learning outcomes are interconnected in the educational process (Alexander et al. 1991; Allport 1935). However, given the stronger linkage between cognitive and skill-based outcomes, the hypothesized hierarchy proves to be more feasible in spite of the cross-sectional nature of this research.

Furthermore, the study showed that changes in the learning outcomes of EE interventions are not always unidirectional. Therefore, combining knowledge, skills and attitudes under task-based self-efficacy (e.g. Lorz 2011; Barakat et al. 2011; De Noble et al. 1999) in some cases may lead to misinterpretations of the evaluation of the outcomes; that is, it is reasonable to assess them separately.

8.1.2 Practices of entrepreneurship educators: teaching models in action

The local entrepreneurship educator tends to be a well-experienced mature individual with views on both education and entrepreneurship that are already well formulated. In spite of the historical and economic legacy of Estonia and Latvia, the contemporary educator possesses entrepreneurial experience in self-employment (business consultancy), small business management or classical entrepreneurship that in the Estonian sample even exceeds the teaching experience. A few entrepreneur-educators have limited experience in teaching, though

experience in either pedagogy or entrepreneurship is not always among the recruitment criteria at Latvian and Estonian HEIs. Do the educators have to possess experience in entrepreneurship to ensure acquisition of transferrable competences by students? (Fayolle 2013; Fiet 2000a) Having entrepreneurial experience is necessary but not sufficient to be a qualified educator. On the other side of the coin, being only an educator with some though limited experience in the corporate sector or as an entrepreneur has its shortcomings. For example, in certain instances of an experiential study programme one would not be able to act as a mentor or consultant because being capable in educational principles is not enough for advising or guiding on solutions in the world of entrepreneurship. If we are dealing with a traditional awareness-raising programme, the possession of entrepreneurial experience does not necessarily have to be the recruitment criterion, unlike expertise in pedagogy and entrepreneurship research. There are several other distinctive findings related to the teaching models and linked to this debate. In particular, the best learning outcomes are reported by graduates whose educators, pursuing the demand-competence models, have considerable well-balanced experience between pedagogy and entrepreneurship.

Béchar and Grégoire (2005) conceptualised the three teaching archetypes, or models, in entrepreneurship for higher education over a decade ago but, to the best of the author's knowledge, the framework has been unfairly neglected in the empirical EE literature despite being comprehensive and simple to use. The work also fits well with the well-known classification of the general teaching modes (about, through and for) and aims (understand entrepreneurship, become entrepreneurial, and become an entrepreneur) of EE (Bridge et al. 2010; Hytti et al. 2004) as well as the dominant learning paradigms (Kyrö 2005). The adapted version of the framework included the broader set of operational dimensions. The reduction of the qualitative data around these dimensions as exemplified by 8 educational interventions demonstrates how teaching models work in practice – that the characteristics and interplay of the dimensions converge into the supply, demand, and competence models or the bordering hybrids. This both uncovers the novelty of the application and responds to the recent open queries-reflections by Fayolle (2013) on who the educators are and what they really do in their interventions.

As a reminder, while performing the diagnostics, the demand and demand-competence models were seen as synonymous with experiential interventions, while traditional interventions were viewed through a prism of the supply- and supply-demand models. A more distinct spread across the traditional and experiential EE was found in the Estonian sample, while in the Latvian sample the

institutions tended to aggregate around hybrid models. Focused primarily on the operational dimensions (curriculum, methodology, assessment, environment, regulations and financing) the findings were extrapolated to the ontological level (learning paradigm, education theory base, approach, role of students and educators). Admittedly, during the interviews, the educators did not refer to any ontological terms and did not reason the choice of their practices from this angle.

In responding to the interview questions, the educators did not reveal that their pedagogical choices are grounded in the didactical choices, that their practice is deeply thought through and in any way customised towards the background or types of audiences exposed to the teaching process. The educators were more like bricoleurs who resorted to the available assets at hand without questioning their appropriateness or measuring the effectiveness for that matter. The more conscious pursuit of the chosen intervention type by the educators in the demand-competence models is mainly driven by the belief that their approach is the most effective. In general, the educators' stance is rather fixed and self-assured than growth-oriented, although none of the HEIs measures the outcomes of EE systematically. In this light, the findings suggest that a number of the educators would benefit from professional development trainings in the general and entrepreneurship pedagogy. Most of them report the prevailing use of practice-based learning activities regardless of the teaching objectives targeted. Yet, the differing scope and depth of the respective teaching methods informs that there is an overwhelming emphasis on action-based learning; that is, doing something in contrast to attending classical lectures. The action component in this interpretation lacks reflection, as the teaching method and feedback loops foreseen by constructivist theories. Of course, there are exceptions, namely, 3 schools (2 Estonian, 1 Latvian) out of 8, where reflections were emphasised, though these cases are not enough to make up a distinct pattern. The lack of learning from personal reflection and mistakes is clearly visible on inspection of the evaluation and teaching methods employed. The finding is even more pronounced in the Latvian HEIs than in the Estonian HEIs.

The data convergence around the operational dimensions did not imply operational coherence. Quite the opposite, one of the current weaknesses in the educators' practice was the disparity between the aims set, outcomes expected and methods used as also noticed by Matlay (2006). Operational incoherence, particularly among the dimensions controlled by the educators directly, endangers the learning process, according to Bécharde and Grégoire (2005) and Kraiger et al. (1993). Likewise, Prosser and Trigwell (1999) state that learning is likely to become a result of teaching only when plans, methods, content and other components of a study programme are selected appropriately. Respective teaching

approaches become appropriate when tailored towards the discipline, aims, outcomes and type of audience. Otherwise there is a higher risk of what Vermunt and Verloop (1999) call an incongruent or destructive relationship between teaching and learning.

By giving due consideration to different layers of coherence (Béchar and Grégoire 2007) that in the adapted version of the teaching models framework are referred to as coherence among the internal dimensions, between the external and internal dimensions, and between the external dimensions of regulation and financing, and we can also notice several disparities as concluded in Chapter 6 (section 4). The results of the quantitative study suggest the first layer of coherence might have been the most influential because HEI C demonstrated better scores for some learning outcomes in Estonia, while HEI G in Latvia did not. If performance at these experiential HEIs is taken as a benchmark, traditional schools did quite well on both learning and objective outcomes in the two countries. This supports the classical view of coherence suggested by the science of education (Ramsden 2003; Biggs 1999; Prosser and Trigwell 1999).

Another weakness in EE design and subsequent delivery is the lack of interdisciplinarity. Apart from extracurricular activities such as hackathons, entrepreneurship camps, and business competitions in which only a few students participate, the learners did not have an opportunity to work on projects in interdisciplinary teams. This indirectly points to the underdeveloped EE ecosystem, namely, cooperation among business schools and universities. Although the samples of learners to whom the interviewed educators delivered EE consisted of business graduates, in each country there are technical or large state universities, which are potential suppliers of non-business students, including designers, physicists and engineers. As is well known, most inventions and innovations and scalable business ideas originate from non-business disciplines. By means of interdisciplinary projects, the HEIs could presumably make a more distinct contribution to developing the knowledge economy in the region through increasing the number of STEM start-ups. This could also help increase the quality of student ideas in the learning process.

Regulations have been exerting a constraining influence on EE in Latvia that, unlike in Estonia, is not directly supported at the policy level. Yet, EE infrastructure only starts to form in both countries where the lack of funding is an equally salient limitation. Subsequently, there is indeed no ready infrastructure that could help the educators leverage the experiential teaching methods. At the same time, there is an absence of signals that the context itself is not ready. The commencement of the formation is marked by mushrooming student incubators that risk facing

uninspiring impact figures in the long term. The reasons for this contention are grounded in simple demographics (proportion of young people in the local population and the emigration trend), the likely inability of HEIs to sustain the incubators since financing is insufficient for training and supporting the qualifications of the educators let alone quality mentorship and guidance for start-ups; finally, much more resources have already accumulated in the larger incubators in both countries (e.g. Technopol in Estonia and TechHub Riga in Latvia).

The qualitative findings of the study are entirely devoted to the educator's side of teaching entrepreneurship. But the learner's perspective, her experience, learning habits and ability to learn experientially could also affect the quantitative patterns discovered. The two following subsections bring up some thought-provoking ideas that can help deepen our understanding of the reasons behind the unexpected statistical findings.

8.1.3 Forms of educational intervention vis-à-vis learner outcomes

In attempting to explain the apparent paradox in the results of comparing the outcomes associated with experiential and traditional EE interventions, we find pertinent the educators' experience, operational coherence in teaching, the learning patterns of the graduates, unique features of the HEIs researched, and infrastructural and ecosystemic constraints. Plausible explanations can also be found in the learning theories or principles of the social constructivist paradigm.

Learning outcomes

If we compare the profiles of the educators at the HEIs delivering the most experiential EE in the region – HEIs C and G – it is clear that the educators at the former school, Hannah and Leo, have considerable experience that is equally balanced between entrepreneurship and pedagogy. The educators at the latter school, Dan and Jack, are quite successful entrepreneurs but relatively new to teaching entrepreneurship; at least they have less experience in it compared to other *entrepreneurship* educators in the Latvian sample. This might have been a hindering factor in the formation of balanced learning outcomes among the students. In addition, HEI G as such stands out in several more respects that contribute to explaining why the graduates from this school did not report the best perceived outcomes in Latvia.

Judging by the lowest level of prior entrepreneurial career aspirations and Jack's responses, it is sensible to conclude that HEI G attracts applicants who are aiming for well-paid employment upon graduation and not private entrepreneurial activity, contrary to HEI F with a predominantly experiential EE delivery. Unlike other schools, HEI G adopts rather competitive admissions criteria where knowledge of English and mathematics is primarily assessed. Hence, it selects applicants with a priori more analytical than creative minds. However, even at HEI F, where the intake features no specific selection filters or significant competition, the resulting level of knowledge and entrepreneurial career aspirations decreased relative to the prior level. At HEI G, the overall study load and academic demands in other disciplines are substantially higher. All the courses are compressed to 2–8 weeks and organised upon modular principles. Courses other than entrepreneurship, such as financial economics, are more difficult to pass, and therefore, require more attention and effort from the students. Entrepreneurship, in turn, is a 5–8 week course (depending on the study year, the 1st or the 3rd), where students can have a bit more fun, do less reading and allow themselves to be more creative.

The quantitative study project did not cover the learning habits and preferences of the graduates prior to admission to the HEIs. However, a brief investigation of the secondary educational context, where the basic learning standards and habits of young applicants are established, returns a rather traditional picture, albeit with a substantially increased amount of group work and discussion over the past two decades. According to the educators, the preferences of local students towards either experiential or traditional learning do differ dividing the subjects into proponents and opponents of educational innovations. Yet, any teaching strategy makes sense when it brings about learning and the subsequent outcomes (Pitkäniemi 2009). It is arguably not the initial perception of the teaching approach among students, but their ability to learn when this approach is enacted, on the one hand, and the teachers' ability to implement this approach, on the other hand, that matter.

Notably, experiential EE in the Estonian HEI C is enacted quite differently from that in the Latvian HEIs G and F, in spite of the similar intervention volume. During the introductory course, students are given a theoretical basis for entrepreneurship, while the choice of topics is driven by the students themselves as per the demand model. Only then, being already equipped with the relevant knowledge and having already decided on attractive business ideas, are they allowed to “swim in the real world of business” and put effectual thinking into practice in line with the competence model. In parallel, during both parts of the intervention, the students

reflect on their learning experiences. These features as well as the personality of the lead educator Hannah apparently make experiential EE at HEI C more effective. The students at HEI G also had to write learning diaries, but the entrepreneur-educators did not have much time to read and really make use of them. As for HEI F, the active component of experiential learning evidently dominated over the reflective. The methodological approach there was rather based on a potpourri of action-based methods. In addition, the applicants to the Estonian HEI C were more predisposed towards entrepreneurship in comparison to the applicants to the Latvian HEI G. The students' ability to learn through action and reflection is another pertinent issue that holds for novices in higher education and experiential learning as well as entrepreneurship (e.g. Günzel-Jensen and Robinson 2014).

Depending on the teaching approach pursued and the degree of self-regulated learning that students are capable of, the relationship between teaching and learning can be either congruent or incongruent, constructive or destructive (Vermunt and Verloop 1999). Experiential learning per se, governed by the cognitivist and social constructivist paradigms (Löbler 2006), is originally known to be more suitable for individuals that have a substantial luggage of prior experience to capitalise upon, who are experienced and motivated enough to take responsibility for own learning and to construct their own reality (e.g. the humanist theory of learning, andragogy). The research subjects in this study were bachelor graduates in their twenties. Even though they were not complete novices in entrepreneurship, possessing some prior competences, they were still relatively young and more used to traditional learning (that most likely dominated in other courses as well) to fully benefit from the experiential interventions. This argument might readily apply to the graduates from HEIs G and F in Latvia, where the implementation of experiential EE had some shortcomings.

Reflecting back on the importance of operational coherence among the dimensions in direct control of the educators (Béchar and Grégoire 2005b; Kraiger et al. 1993; Prosser and Trigwell 1999), we can identify that out of three institutions where EE was diagnosed as experiential (C, G) or predominantly experiential (F), only HEI C has its positions congruently aligned along the demand-competence and competence models. It tends to generate more entrepreneurial activity, uses highly experiential teaching and evaluation methods for that, and educators establish friendly and supportive relationships with students. HEI G has moderate aims of not much more than personality development and increased motivation to pursue an entrepreneurial career, but attempts to employ experiential team-centred methods that develop the expertise of students in a situational context by letting them experience entrepreneurship as a process; and employs evaluation methods

focused on achieving higher grades rather than sense-making. A similar issue pertains to HEI F, except that Aaron tries to experiment with performance-based evaluation. This observation might illustrate how operational incoherence within a teaching model may act as a divergent force preventing an educator from achieving her teaching aims.

Objective outcomes

Many more questions remain with the objective outcomes of the entrepreneurship-related human capital investments, where only in the Latvian sample was a weak indication found that experiential EE is associated with higher levels of involvement in idea development and implementation phases of nascent intrapreneurial activity. The experiential form of intervention was not characterised by conspicuous correlational linkages between the two groups of EE outcomes either. The aforementioned arguments related to the operational coherence among the teaching model dimensions, expertise of the educators, and learning patterns of the graduates that may exert vicarious but not direct influence on the objective outcomes because they are expected to occur through the entrepreneurial competences developed during EE. The infrastructural and ecosystemic constraints as well as the limited intervention volume seem to be more compelling reasons. Furthermore, if we consider the explicit aims of the educators towards the entrepreneurial behaviour of graduates in real life, only five of them – from HEI B, C, A and F – mentioned the self and paid employment of graduates. Most of the other educators were expecting entrepreneurial competences acquired during EE to translate into objective outcomes.

When interpreting the findings, we should bear in mind that the local EE ecosystem is at a very early stage in its formation. This implies that the educators have a limited number of options with which they can leverage existing teaching methods. Can superior results be achieved in a context with no favourable ecosystemic support? The teaching aims pursued and experiential methods employed by the educators are quite similar to those at European universities, but the environment expressed through the educational infrastructure and the system of networks among stakeholders, usually demanding considerable investment of financial and temporal resources, differs a lot in countries with developed economies, such as the UK, Netherlands and Finland, for instance. To build and sustain (pre-) incubation facilities, design and prototyping factories and university-industry cooperation platforms, the local HEIs need extra financing. To the extent possible, several initiatives are being implemented thanks to EU funding. Having

ad hoc and competition-based streams of financing support for these purposes might even be more appropriate than regular government support as paradoxical as this may sound. By carrying out a series of projects in one or more local HEIs, the region can build up relevant social and human capital slowly but steadily. Alternatively, it is an open question whether the educators at the current level of expertise in experiential EE would be qualified enough to use the infrastructure effectively.

Aside from questioning the effectiveness of experiential EE, the obtained results incur that either the choice of HEI or EE as such is currently not the first-order factor in determining the entrepreneurial behaviour of bachelor graduates in their short and medium-term career paths. Acknowledging that the researched subjects underwent on average only 6 ECTS points worth of intervention, its effect could have certainly been marginalised. For the same reason the means for greater outcomes that exist in experiential groups in descriptive terms could turn out to be non-significant in inferential terms. At the same time, in the hands of a talented or well-trained educator even a short intervention can become life-changing for students. As one of the principal conclusions of the study, we can establish the mainstream expectations of EE as somewhat inconsistent with its current state and outcomes.

To sum up, should the aforementioned socio-demographic and contextual factors apparently conditioning the EE deliverables not be taken into consideration, the blind assumption that experiential EE works better than traditional can be misleading. The findings of this study clearly signpost that experiential EE does not always work as expected in terms of both learning and the objective outcomes for graduates. Nearly 80 years ago, John Dewey, the leading proponent of pragmatism who stood at the forefront of the experiential learning theory, expressed a consonant thought by saying: *“the belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative”* (1998:13). As a matter of fact, this simple truth is often forgotten or neglected in the overwhelming stream of rhetoric asserting that experiential EE is “a panacea for all illnesses”.

8.1.4 Associations between learning outcomes and objective outcomes

Testing the basic premise of human capital theory for EE, which goes beyond the intentions-nascency link, has so far been an untapped research endeavour. Human capital investments in EE may or may not lead to competence development, which, in turn, may or may not result in entrepreneurship-level outcomes from these investments. The conducted statistical analysis, and in particular, the comparison

of learning outcomes of entrepreneurship and non-entrepreneurship, business and non-business graduates, gives grounds for establishing EE-related changes in the cognitive, skill-based and affective states of the research subjects. However, referring back to Man et al. (2002), and Bird and Schjoedt (2009), the possession of the relevant competences has little meaning until they are manifested through one's behaviour and actions, in this study expressed as employability, nascent intrapreneurship and private early-stage EA. Further comparisons with the same control groups indicated greater means for the expected objective outcomes among entrepreneurship graduates but also among non-business graduates (due to key affective determinants). Although the differences were statistically insignificant in both cases, these associations suggest that there was a certain fraction of the contribution of EE in the objective expressions of entrepreneurial behaviour analysed. Based on this, the dependence of the latter on the learning outcomes was tested, revealing that only affective outcomes play the most crucial role in the transfer of learning (Schunk 2012; Unger et al. 2011).

Despite most EE programmes aiming to develop knowledge and skills to facilitate the achievement of entrepreneurship-level outcomes, the latter appears to be statistically independent of these learning outcomes if evaluated in the short- and mid-term period after graduation. In the absence of direct relationships, one may contend that the education- and entrepreneurship-levels interact in a more complex manner. Taking into account the mediating role of skill-based outcomes in the relationship between cognitive and affective outcomes, the knowledge and skills acquired through EE might also exert certain albeit non-significant influences on employability, nascent intrapreneurship and private early-stage EA through affective factors. In some cases, they can even be inversely associated with the objective outcomes. When all the types of learning outcomes were included in the model together with the battery of control variables, the direct effect of cognitive outcomes on graduate private venture creation in Latvia turned out to be significantly negative. Consonant with the gap that exists between academic research and the real implementation of its results, one wonders whether a gap between EE and real life exists.

Naturally, the gap between education and the professional life of graduates holds for other disciplines in higher education too. The idea behind experiential approaches is to narrow this gap to an extent possible by mirroring the complexities of life and by linking learning to personal experience (Sackney and Mergel 2007). From a formal viewpoint, however, there is a great difference between entrepreneurship and other disciplines in terms of tangible output expectations on the part of learners. At least in the Central Baltic region and most likely in Europe

as a whole, graduates with a degree in physics, biology, sociology, history – any of the social or exact sciences – get respective qualifications; in other words, they become physicists, biologists, sociologists, historians, but with entrepreneurship the case is different. Notwithstanding the decades of academic and centuries of existential history, there is no such *de jure* professional or academic qualification as an entrepreneur, yet there is an enterprise manager or a degree in enterprise management. Entrepreneurship is intrinsically harder to teach; that is, to ensure the process is experienced properly given at least three archetypical teaching objectives. Therefore, EE is most often not a means to an end, but simply the first encounter.

One could otherwise inquire whether the competences that are taught at entrepreneurship courses match those demanded in professional life on top of whether they are taught well enough. Further, how accurate is the set of cognitive, skill-based and affective outcomes measured in universally reflecting what meaning the educators themselves assigned to learning outcomes/competences while teaching? Are the learning outcomes best measures at all or only commonly referred to in the evaluation reports and programme descriptions for the sake of formally adhering to the European Competence Framework standard? Reiterating Scott et al. (2015), can they be profitably used to measure the effectiveness of experiential EE, particularly if a researcher attempts to move away from subjective assessment? This study argues the tripartite framework of learning outcomes can be valuably used to evaluate the achievement of the education-level objectives and applied either in quantitative or qualitative research settings. The views of educators on what should constitute targeted competences may vary, while the reasons behind the non-achievement of expected objective outcomes can be explicable with training transfer.

Learning as a function of changes in cognitive, skill-based and affective states has a central role in training effectiveness (Kraiger et al 1993). Acquisition that transforms learning experiences into entrepreneurial competences, and the retention of the acquired competences, are known to bridge the intervention characteristics (e.g. audiences, design, organisation, and environment) with the generalisation of the learned material and maintenance of trained skills or behaviours (in other words, competences) on the job (Unger et al. 2011; Baldwin and Ford 1988). In this process, the amount of learning obtained was found to be an important precursor to transfer (Goldstein 1991, in Kraiger et al. 1993), while the analysed interventions were limited to 6 ECTS points. The discussion of training transfer once again brings up the importance of operational coherence in EE; the issues of intervention volume, externally influenced operational

dimensions and more careful consideration of learners' characteristics (level of prior entrepreneurial proclivity, learning habits, experience, etc.).

It should also be acknowledged that outcomes in the professional life of graduates can take more time to mature. In the studied time frame, statistically immeasurable, subtle results could have been generated that might bear fruit later. However, this argument comes with no scientific certainty because the time that passed since graduation to the moment of the survey was accounted for with the variable of graduate status. The final year bachelor students were only less likely to engage in private early-stage EA in Estonia. In all other instances, the differences were non-significant. Therefore, assumptions that the findings from other studies (e.g. Lange et al. 2011; Charney and Libecap 2000) and programmes (i.e. Babson College, Berger Entrepreneurship Programme) are replicable in the local context if the longitudinal time frame is captured, should be made with a greater amount of scepticism. This, however, does not undermine the fact that individuals tend to become entrepreneurially active in professional life after 30–40 years of age (e.g. Teigland et al. 2011).

8.2 Theoretical and methodological contributions

This monograph also made a number of theoretical and methodological contributions to EE research including but not limited to: a structured elaboration on the emergence and development of EE, the integrative framework for evaluating the outcomes of EE central to this work, constructing the employability index and the application of the mixed methods design.

EE is sometimes viewed as a mature academic discipline (Gorman et al. 1997) and referred to as a legitimate field of research (Katz 2003). While both statements are applicable to entrepreneurship, this work argued they do not yet apply to EE. The key theories that make up the content of EE interventions were discussed along the lines of the three known worlds – entrepreneur, process and cognition – and the new frontier of entrepreneurship as method (Neck and Greene 2011). The overview exhibited that the theoretical side of EE is fully dependent upon the eclectic developments in entrepreneurship research, while the pedagogical side is informed by a few frameworks that lack empirical enactment (Fiet 2000b). To overcome this as well as the disconnectedness of EE research from education theory (Fayolle 2013), the monograph further linked the main theories in education with the teaching models in entrepreneurship (Bécharde and Grégoire 2007, 2005b) and substantiated the tripartite competence framework (Fisher et al. 2008; Kraiger et al. 1993) as a viable approach to write and evaluate learning outcomes in EE.

EE scholars often operate with such purely educational terms as “learning”, “teaching”, “studying”, “education”, “training”, “mentoring”, “facilitating”, “coaching”, among others, often leaving them undefined or even using them interchangeably. Likewise, the key notion of experiential EE is rarely given a clear definition in the relevant literature (e.g. Scott et al. 2015; Krueger 2007; Löbner 2006), although differing meanings might be assigned to it in different contexts. For instance, such a teaching method as business modelling may or may not include product development or prototype testing; it can be considered quite traditional with or without this component in some of the US schools, while it would certainly be labelled as experiential in the schools in the Baltic context. The key terms were comprehensively defined in this monograph.

The overview presented here of the impact studies in EE might not be exhaustive in attempting to select only top-tier papers but it covered the mainstream measures of EE outcomes and was geared towards experiential interventions. This part of the literature review also stands out in including several qualitative papers as well as papers from other disciplines (accounting, nursing and physics) that brought in greater variability of results in relation to the impact of action-based learning. On the whole, the conclusions of the overview were consonant with those of Rideout and Gray (2013) and Martin et al. (2013), and adopted a more critical stance towards the positive impact reported in previous studies.

The theoretical part culminated in devising the novel integrative framework for evaluating the outcomes of EE. Needless to reiterate, it is the first and unique attempt at incorporating education- and entrepreneurship-level outcomes relevant for many study programmes and courses. This framework takes a more holistic view of the outcomes' measures beyond the plethora of models of entrepreneurial intentions that fill the EE impact literature. The tripartite structure of learning outcomes, in turn, is specifically designed for the educational context. Configuring EE courses within various teaching models links pedagogy and didactics to certain learning and objective outcomes of graduates, thereby ensuring deeper engagement of the evolving theoretical base with pedagogical practice in EE (Rideout and Gray 2013). While the classical educational objectives of developing knowledge, skills and attitudinal outcomes make up an important part of the evaluation, the attainment of entrepreneurship-related objective results, such as becoming a nascent intrapreneur, entrepreneur or self-employed professional, should distinguish graduates in EE. The integrative framework serves researchers and educators in harmonising what is being targeted with what is being evaluated to identify what efforts worked out or did not, as well as in overcoming the limitations of formal assessment practices in higher education. This framework can be further

improved by other researchers and tested fully using advanced methods such as SEM; that is, as a monolithic statistical model, for which the refinement of the objective outcome measures is required.

Most of hypotheses in the study did not find support, questioning common assumptions about EE, including the emphasis placed on experiential EE. Qualitative study programmes in entrepreneurship usually envision preparing students for professional life by equipping them with relevant knowledge and skills, which then transfer into enhanced graduate entrepreneurship in its broadest meaning. Put another way, an implicit direct relationship is built into the logic of this argument based on human capital theory. The fact that none of the expected direct relationships were found in the period of the study might imply that moderators and mediators should be considered instead (Martin et al. 2013; Rideout and Gray 2013), and that the human capital theory premise does not apply to short- and mid-term evaluations. The learning environment as such can play a mediating role between the competences developed and the professional achievements of graduates with sufficient variation expected between different experiential EE courses. On the other hand, the reason might also lie in the quality of the learning outcomes of EE that affected the subsequent transfer (Kraiger et al. 1993; Baldwin and Ford 1988).

From the methodological viewpoint, the monograph firstly fulfils Blenker et al.'s (2014) recommendations for more refined forms of research design and data analysis to counter the strong reliance on descriptive analysis and the shortage of mixed methods studies in EE research. In addition, combining both qualitative and quantitative research strategies in the multiple case study embedded design, and cross-sectional and comparative designs, the study employs structural equation modelling to estimate the first part of the integrative framework. Concurrently, this included the refinement of subjective measures used in earlier research by Fisher et al. (2008) and the revalidation of the tripartite competence framework with the more rigorous method of statistical analysis. Along with the application of SEM, the study addressed Kraiger et al.'s (1993) call for multidimensional perspectives on learning outcomes and construct-oriented evidence of their validity but in relation to EE. Coming up with several subscales of affective outcomes during the exploratory analysis on top of the SEM-estimation made it possible to construct the composite indicator of affective outcomes that was used in further statistical tests. Furthermore, the implemented mixed research strategy clearly signposted how quantitative and qualitative methods can enrich one another, and how vital it is to combine them.

Responding to one more crucial methodological observation by Blenker et al. (2014), that most EE studies in Europe rely on empirical material from developed countries, this study is based on findings from two neighbouring north-eastern European countries, Estonia and Latvia, both carrying the historical legacy of a command economy. The post-transition context was important and indicative to study for a number of reasons, among others: an existing and distinct variation between traditional and experiential interventions, in most cases an absent EE infrastructure, the highest TEA index in 2013 and still above the EU-average at present. To date, this research is the only one of its kind and calibre in the Baltic region.

8.3 Limitations of the study

The monograph has limitations to a greater or lesser extent in at least five areas that require recognition and discussion: interpretation of the qualitative data, use of a cross-sectional design, the time frame of the survey and retrospective assessment of learning outcomes, sample size or number of observations per HEI and the generalisability of the findings, and the measures of outcomes (self-reports, subjective aspect in the objective outcomes).

The qualitative study featured some limitations that should be acknowledged. On the one hand, the presence of the four management educators with entrepreneurial experience served as a valuable add-on to entrepreneurship educators teaching courses worth 6 ECTS, especially at HEI D and H. On the other hand, it also limited the analysis by reducing the number of initially targeted informants. This incurred extra risks in the classification process and determining where an HEI is positioned on certain dimensions. For example, Aaron's stance was more experiential than that of Alex in several instances (less the reflective component), while the responses of both educators should have been considered to reach the same conclusion on the dominant teaching model in the process. This, however, did not affect the final classification into the prevailing forms of intervention, and HEIs D, E and H brought about less problematic dilemmas. Next, while two interviews were initially considered enough to reach conceptual saturation, it appeared that the entrepreneurship educators at HEIs A, B, C, and G complemented the answers of one another literally, meaning that the answers to standardised questions were repeating less than expected. At the same time, the *de facto* saturation was likely to be reached because there were no other entrepreneurship educators in the analysed HEIs to approach. The ability of respondents to narrate about how they teach might have also affected the data

interpretation. Some informants might be naturally inclined to exaggerate the state of things to make them look “in better shape” depending on their awareness of contemporary mainstream approaches to EE. Others may have conversely been more modest or less knowledgeable. The selection of experts based on personal networks and the CB Entreint project networks was meant to tackle this criticism. The interview content assumed that the informants would report on factual rather than wishful teaching practices.

Most commonly, it is recommended that a quasi-experimental design would be best to employ in order to capture educational impact in this kind of quantitative study. The clear-cut limitation of any cross-section that was nevertheless more feasible to use is the challenged internal validity, where the causality sought was supported with the logic of previous studies that applied similar designs and had similar expectations of EE (e.g. Piperopoulos and Dimov 2014; Kolvereid and Moen 1997), as well as drawing support from the quantitative analysis. The latter was achieved through comparisons of entrepreneurship and non-entrepreneurship graduates in the Latvian sample, and of business and engineering graduates in the Estonian sample that indicated changes in outcomes possible to associate with the interventions. Because the results met the expectations and/or earlier findings, it was logical to accept they were transferable between the two countries notwithstanding the lack of counterfactual control group in each. As far as cognitive and skill-based outcomes were concerned, the respective questions in the survey prompted a self-assessment of change induced by EE, thereby already implying that the causal effect is measured. Mapping the levels of prior knowledge, experience and aspirations against the resulting levels of the learning outcomes helped uncover the upward or downward trends prevailing within every learning domain in terms of the HEI and the form of intervention. Although there was no time-based ordering of the variables, the cross-sectional design still allowed us to uncover the relationship between them, while the internal validity was supported with the aforementioned arguments.

The cross-sectional nature of the study also explains the retrospective assessment of the learning outcomes of EE. Acknowledged as a limitation, it does not seem critical for comparing the perceived outcomes of traditional and experiential EE. Neither it is critical in light of the unexpected findings related to the form of intervention, since learners are usually believed to remember takeaways from meaningful experiential learning better (Kolb 1984). Furthermore, there is no unifying conclusion in the literature with respect to the relationship of short-term subjective measures and their persistence in the future (Lange et al. 2011; Lucas and Cooper 2004). The further the assessment point is from the end of the

intervention, the more factors unrelated to education might interfere, despite the potential development of deeper sense-making from learning over time.

The chosen time frame built into the sampling strategy – imminent graduates in the final year of a bachelor programme and recent graduates within two years after receiving their diploma – was a balanced trade-off between the short-term, which may yield immature objective outcomes or “too fresh” learning outcomes, and the long-term, when it gets more challenging to capture the associations between the two types of outcomes given the retrospective aspect. Along with this, the sample was skewed towards the recent graduates. However, the time frame of the study did not make it possible to clarify how the analysed associations behave in the long-term, while the graduates might enter into more profound and sustainable entrepreneurial actions at a later stage in their lives at which point EE, either traditional or experiential, could prove valuable (e.g. Lange et al. 2011). To conclude on the issue of time, one should also notice that the graduates who contributed to the survey were largely unaffected by the financial crisis of 2007–2008. Their prior entrepreneurial aspirations, however, could have been influenced by the growing popularity of entrepreneurship in Estonia and Latvia.

The sampling strategy also feeds into the third disputable theme – the generalisability of the findings, or complying with the external validity criteria. For the reasons discussed in Chapter 5 and the validation of the sampling in Chapter 7, the statistical findings related to hypotheses H1–H2, H4–H6 raise no major concerns. Referring back to Creswell (2012), if a target population is relatively small and the sampling strategy is a conscious choice flowing from the research design, findings from relatively small samples can still be generalisable. It is even probable that the generalisability spans beyond the analysed countries into other post-transition economies. That said, the number of observations per HEI could have been greater in schools B, C, and H. The non-response bias was not rendered possible to assess by HEI. Judging by the response rates, the experiential school C (6.6%) was the least active in contributing to the research. These numbers become more critical for testing H7 than H3. In the regressions of nascent intrapreneurship and private early-stage EA, they met the bare minimum. The rule of thumb pertaining to the number of variables, however, is complied with in all the regressions (at least in its lenient version), but with no supported hypotheses in this respect one might suspect the possibility of a Type II error. Therefore, it would be commendable to replicate the testing of the second part of the integrative framework with larger samples.

The assessment of self-reported outcomes is a well-accepted practice both in education and EE research, as has been argued in Chapter 5. Yet, relying on more

objective measurements through short cases or situation analysis to assess the triad of learning outcomes would be more preferable and even better differentiate the study from the range of other assessments of this kind. The main problem with self-reports is that the subjectively perceived rather than the actual change is nevertheless assessed; while being close (Kraiger et al. 1993), they are not the same. Possibly, having employed more objective measures the study would arrive at slightly different conclusions on H4–H6. We should also bear in mind possible endogeneity bias that could occur as a result of measurement error or omitted variables. Furthermore, several items in the group of outcomes representing objective expressions of entrepreneurial behaviour do feature the subjectivity aspect. For instance, “satisfaction with work content”, “degree of influence in decision-making” in the employability composite are again assessed by the respondents themselves. Its construction was also subject to few measurement constraints. In the intrapreneurship sub-scale, the researcher relies entirely on the respondents’ subjective understanding of their role in the ideation and implementation of new ideas.

One more limitation in connection with the measures employed refers to the affective outcomes composite. In the frames of the study design, only the first sub-scale (affection for entrepreneurship) could be paired with prior aspirations, while the change in other subscales was not gauged. Based on the comparisons with non-entrepreneurship and non-business graduates, however, it was revealed that the mean values of the sense of self-reliance and attitude to risk/failure, unlike other items, were slightly lower among entrepreneurship graduates (interpreted as a post-hoc levelling off effect); similarly, the means of creative attitude, self-confidence and attitude to risk/failure were lower among business graduates (interpreted as the inverse relation to knowledge and skills as well as generally higher ideation capacity among non-business fields). This finding helped increase credibility in the five other subscales of affective outcomes as *outcomes* of EE regardless of the direction of change.

The construct validity of the measurement instrument employed to assess the perceived influence of EE on the learning outcomes was established together with the concurrent validity (Hair et al. 2010), since the SEM models were very similar in Estonia and Latvia. Hence, the model is expected to result in a similar composition of items if applied in other post-transition countries. However, there is a limitation related to the array of items initially included in the questionnaire, as well as the influence of the content of entrepreneurship courses on the purification process. Simultaneously, the share of the contribution of management education to the estimated learning outcomes remains questionable as we earlier

established that the managerial aspect remains strong in some EE courses; in a similar vein, entrepreneurial aspect can be present in management courses. The baseline EE intervention of 6 ECTS in this context can be treated as a limitation affecting the analysis. For an educator, it might be challenging to achieve the balanced development of cognitive, skill-based and affective outcomes as well as to ensure their enactment in authentic settings within the limits of one single course. At the same time, there is no guarantee that a larger intervention volume would boost the expected outcomes either (Martin et al. 2013).

The research did not consider such a training input as intrinsic or extrinsic motivation of the subjects towards studying entrepreneurship, especially under the conditions of formal education (Hytti et al. 2010; Baldwin and Ford 1988). Yet, higher prior entrepreneurial aspirations may simultaneously imply that an individual is interested in studying the discipline and finds it important to do so, in a way reflecting intrinsic motivation.

Finally, some methodological choices pertaining to the bachelor level, the business background of the graduates and formal education, which initially delimited the study, at the same time, narrow the scope of the findings. They may indeed turn out to be different if non-business graduates are studied (as few comparative tests with engineers suggest), if master-level or higher graduates, who are essentially more mature and more self-conscious, act as the research subjects, and if the contribution of formal and informal schooling to entrepreneurial competences is compared.

8.4 Practical implications and recommendations

Higher education in the social sciences, where the field of entrepreneurship has been evolving towards becoming trans-disciplinary (Sarasvathy and Venkataraman 2011), is a major channel for a growing and developing young generation. Unlike the objective reality that exists a priori, human nature is a product of human design to which change is inherent and where it is more powerful in terms of societal impact. Consequently, by transforming and improving higher education practices in general and EE practices in particular we can shape the future. In spite of the quite narrow specialisation of this study, its findings suggest several practical implications and recommendations for a number of EE stakeholders: first of all, on EE design and delivery; then, on EE policy development and answering the dialectic question “why study?” in relation to entrepreneurship, and finally, on the research design of further academic studies of the impact of EE.

8.4.1 For educators and decision-makers at HEIs: EE design and delivery

Attainment of the first principal objective of the monograph —the examination of the patterns in linkages between formal EE and its outcomes at the bachelor level – leads to the second objective of devising recommendations for designing and delivering EE that facilitate entrepreneurial learning and graduate entrepreneurship among students and graduates. Curricular design primarily encompasses didactic decisions as per the “Curriculum” dimension in the teaching model framework: the composition of study groups, aims set and outcomes expected, study content and sequencing of educational activities, as well as the ontological principles behind these choices. Delivery of EE includes the closely related operational choices concerning the “Methodology”, “Assessment” and “Environment” dimensions. The practical recommendations generated are grouped into the following themes ensuing from the findings of the study: selection of educators and teaching strategy, selection of students and composition of learning groups, intervention volume, and sequencing in the intervention design.

Selection of educators and teaching strategy

An educator’s role in the formal EE process is as crucial as a student’s role, where the former stands for teaching and makes sense only if it results in learning in the latter that, as known, can occur with or without teaching. Depending on who the educators are, what kind of pedagogical and entrepreneurial experience they possess, what they are aiming to achieve with the educational practice, and what student groups they cater for, it is advisable to establish alignment with one of the dominant teaching models (or their hybrids). Alternatively, an HEI or study programme should employ new educators accordingly.

In aligning the teaching model with audience specificities, the study findings draw special attention to the prior entrepreneurial aspirations and experiences of students that should have been considered when planning the interventions. There are four basic strategies that can be distinguished as Figure 14 outlines. If an experiential programme recruits personnel to teach groups of students who are already highly predisposed towards entrepreneurship and quite experienced, the prospective educators should pursue the competence model and be advanced in both entrepreneurship and pedagogy as well as experienced in entrepreneurship pedagogy. In the analysed data, this should have been a prototype for HEI F in Latvia that was not making the most of its students, presumably due to limitations in EE delivery (e.g. lacking a systematic approach in experiential learning

activities, lacking a reflective component); or for HEI C in Estonia that followed this strategy and showed the best results, at least in the learning outcomes. For highly experiential interventions targeted at new venture creation, a candidate's network of entrepreneurs may also serve as an extra recruiting criterion, since this becomes significant for graduates. Success in entrepreneurship is partly dependent on the network of individuals an entrepreneur has (Ronstadt 1987). Hence, EE programmes should connect students to people capable of facilitating their success (Hindle et al. 2009).

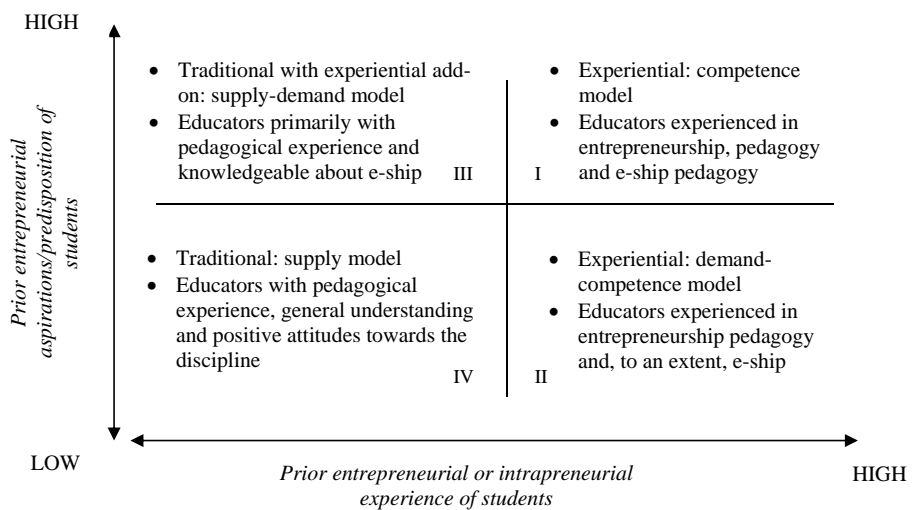


Figure 14. Quadrants for selecting the basic teaching strategy

If an experiential programme recruits personnel to teach groups of students with low prior aspirations but a high level of experience (possibly, failure-dominated), the prospective educators should be highly experienced in entrepreneurship pedagogy and implement the demand-competence model to revive the students' affection towards entrepreneurship through the rediscovery of the strengths and uniqueness of their entrepreneurial identities. This strategy could have served as a prototype for HEI G that tended to recruit successful entrepreneurs rather than experienced educators or educator-entrepreneurs.

The third basic strategy caters for students with high prior aspirations and a low level of entrepreneurial experience. In this case, it is recommended to recruit educators primarily experienced in pedagogy yet also knowledgeable about the discipline to deliver predominantly traditional EE with some elements of experiential learning. The latter as a fraction of the overall load would gradually

augment the experience of the learners at the same time as balancing their initial predisposition with improved knowledge and skills.

The fourth strategy is targeted at novices with low levels of entrepreneurial aspirations and experience to whom the supply model would be the most appropriate to build up a general understanding of the discipline (declarative knowledge) and induce a positive attitude towards it through group work, guest lectures and simple case studies. Therefore, educators possessing the relevant competences themselves alongside pedagogical experience should be recruited.

According to B  chard and Gr  goire (2005a), no model of teaching is inherently superior to others. Depending on learner characteristics, which should serve as a reference point in curricular design, one or another teaching model becomes more appropriate to follow. Entrepreneurship can be best learnt through relevant experience, but referring back to the critical reflection on the teaching model of best fit, before learning how “to think outside the box”, one should master “thinking inside the box”. One of the implications supporting the earlier theoretical reflections is that EE is not worth running as a highly experiential intervention for all kinds of students, “the one size fits all” approach would not work. By a method of exclusion, guided by the examples of HEIs A, B, G and H and matching the students’ characteristics with the educators’ objectives and teaching approach, one can find more arguments that favour “the old school” approach. Judging by the dynamics in the learning outcomes, traditional EE worked better in HEIs D and E than experiential EE in HEIs F and G. The old classics should be especially more appropriate for those novices in higher education and entrepreneurship who are used to traditional forms of learning since secondary school.

Selection of students and composition of learning groups

Complementing the selection of educators, purposeful casting or classification of students based on predetermined criteria and further streaming them into compatible educational groups seems reasonable and would ensure more rational use of resources. Knowing how crucial prior entrepreneurial aspirations, experience, and motivation are, curriculum developers and study programme directors can benefit from this information. When planning experiential EE interventions, it is supposedly more sensible to pursue the “fewer but better” approach, either one casts for venture creation (competence model) or entrepreneurial personality development (demand model). Incidentally, the renowned experiential programmes at, for example, Chalmers University of Technology, University of Twente or Jyvaskyla University of Applied Sciences,

adhere to quite rigorous selection criteria where applicants compete to be accepted based on their initial business ideas, motivation, individual entrepreneurialism, and so on.

In the post-transition context where resources are even more limited, teaching entrepreneurship to undergraduates should be focused on certain groups of students. While general awareness-raising courses can be university-wide and large-scale (and there are no grounds to expect much from them in terms of entrepreneurial skill-set or objective outcomes), more experiential interventions should be delivered to smaller groups of selected individuals predisposed for entrepreneurship. In addition, these EE courses are recommended to be organised sequentially such that students first of all get prepared to benefit from their learning experience to the utmost. Quite clearly, for several groups of students in the analysed samples (e.g. HEI A, B, D, E, G, H) this form of intervention is more relevant not as a complete alternative to traditional teaching that develops memory, attention, analytical and critical thinking but as an add-on. The same suggestion applies to the demographically and contextually comparable groups of students in other countries.

One might argue that this stance limits the potential for larger numbers of students, who could immediately try themselves out as young entrepreneurs at the bachelor level irrespective of their internal readiness. However, going massively experiential is more costly and, guided by the findings of this study, would not deliver superior results in comparison to the traditional interventions. The local economy does not need more entrepreneurs and small-scale coffee shops because the market keeps contracting; it needs better entrepreneurs and innovative start-ups with growth potential at the international level. Moreover, the form of learning that fundamentally differs from the one employed in other courses can distract students from deeper level learning, though this clearly depends on the way experiential EE is implemented.

The control group of Estonian engineering students did report greater levels of creativity and self-confidence, positive attitudes to risk and failure as well as affection towards entrepreneurship. These variables in the end proved to condition better objective outcomes among business background students. Although it is known that innovations are born on the borders of disciplines and business-related education is more generalist, the advocacy of shifting towards experiential learning still outcries the necessity to shift towards interdisciplinary learning where in principle the latter should enrich the former. Therefore, one more recommendation that follows is to cooperate more closely with non-business fields (designers, physicists, engineers) at traditional universities when designing experiential EE

interventions. Then a discussion of the real contribution of EE to long-term economic development becomes more substantiated.

Intervention volume

The issue of intervention volume has been touched upon in the discussion of possible reasons behind the unexpected findings, and of the study's limitations. Now, it logically emerges in the recommendations.

Increasing the hours of studies for experiential EE interventions could help achieve better outcomes in a number of ways, given the volume is filled with the right content. First of all, it solves the dilemma for those who are not used to experiential learning. Incorporating a special course devoted to this would teach students how to learn from failures, benefit from reflection exercises, learn from guest lectures by practitioners and company visits, develop a sense of self-regulation, and so on. Secondly, this would enable learning through similar experiences but with differing outcomes, where there is time both to fail and succeed safely. Thirdly, more hours provides enough space both for theory and practice as well as their deeper exploration. As it is known, the more a student practices, the more expert she becomes (Gladwell's 10,000-Hour Rule). Fourthly, longer hours also allow for more personalised learning that appeals to "*the heterogeneity of the learner's everyday practice to reveal her own individual-opportunity nexus*" (Blenker et al. 2012:426). Fifthly, this recommendation finds support in several previous studies where students exposed to larger EE intervention volumes are more likely to achieve better subjective and objective outcomes (e.g. Lange et al. 2011; Kolvereid and Moen 1997). Yet, this result is also known to be influenced by the level of motivation and prior psychosocial "backpacks" (including career aspirations) entrepreneurship students bring with them when enrolling in study programmes or courses.

The smart planning of experiential EE also includes avoiding such a downside as investing in and launching diverse activities or running them in parallel. They should make up a system and complement one another, similar to the practice of Hannah and Leo at the Estonian HEI C. The suggested questions to be addressed with this is how much of the students' time and effort should the entrepreneurship course take in the framework of the acting curriculum, and how should it fit with other disciplines.

Sequencing in intervention design

In addressing the sequencing of study content in course design, some implications can be drawn from the approved hierarchical relationships between the learning outcome types. Because the hierarchy is universal, it applies to all three teaching models.

The very first implication is the prioritisation of developing or extending the knowledge base about entrepreneurship. This does not mean that the other two domains rest inactive. They should be enacted simultaneously but the learning emphasis is placed on one at a time. For example, when acquiring business modelling within the demand-competence model, students learn about each building block of the canvas; that is, activities, resources, network, value propositions, customer segments, and so on (cognitive component), and start drafting their ideas right during the information session (skill-based component). To make the process more enjoyable, the students choose an idea they are eager to work on (affective component). Yet, at this point the main task of an educator is to deliver information about the Business Model Canvas. Further on, the students are required to devise a business model based on previous drafts, work on product development, possibly create prototypes, talk to potential customers, etc., where the main task is to make the students grasp *how* to implement the model. Therefore, skill-based learning is emphasised.

In regard to affective learning, typically it is easy to encourage and positively tune into entrepreneurial activity in the beginning or throughout a lecture. Later, once learners go through the skill-based learning, meet the “harsh reality” and realise how challenging this type of career can be, the course finishes and some learners are left with this takeaway having had their knowledge and skills, on balance, improved. However, the affective outcomes should not stay low at the end of the course irrespective of the grade received or whether the final pitch was successful or not. There should always be an activity or exercise reinforcing the affective outcomes. Another option, if the intervention volume allows, is to keep inducing a positive attitude towards entrepreneurship, strengthening self-efficacy using repetitive or easy tasks, making entrepreneurial behaviour emotionally beneficial for the learners all the way through the intervention.

The significance of the affective outcomes in general, but also creative attitude and self-confidence, affection for entrepreneurship and attitude to risk and failure in particular, for the transfer results (i.e. objective outcomes of EE), should be considered closely. If the teaching aim is to increase graduate entrepreneurial activity, then positive affection and risk and failure-tolerance are especially

important to develop. Business background students tend to be less capable of creative thinking than non-business students, hence it is recommended that this aspect be emphasised to support future employability through a series of exercises or joint projects with designers, craftsmen, architects or other representatives of the creative industries, either students or professionals. Self-confidence in accomplishing certain tasks is rooted in successful actions; therefore, a student's accomplishments should preferably outweigh their failures. The most viable instrument for ensuring this is assessment aimed at providing cyclical feedback beyond mere grading. The more personalised the assessment the better.

In order to understand whether one's practice yields the targeted outcomes, the educators should adopt systems of outcome assessment that would suit their objectives and based on verified measures; for example, the General Measure of Enterprising Tendency (GET) test (Cromie and Callaghan 1997), Attitude to Enterprise (ATE) test (Athayde 2009).

Training entrepreneurship educators

The further professional development of employees is a common practice in human resource management. Improvement of entrepreneurship educators' expertise should not be taken less seriously. Entrepreneur-educators are recommended to take specialist courses in general pedagogy to integrate their professional experience into their teaching practice, while educator-entrepreneurs could benefit from courses in entrepreneurship pedagogy and research. Educators with limited experience in entrepreneurship or industry as such should be required to build up entrepreneurial experience by closely engaging or working in a start-up or established enterprise as part of their compulsory sabbatical. If an HEI strives to pursue the competence teaching model, it should have educators experienced in entrepreneurship on board. Metaphorically, a person cannot teach swimming unless she can swim herself. Entrepreneurial experience also extends one's industry network facilitating firmer connections of academia with entrepreneurs and practitioners.

The need for educators to have a fuller understanding of what they wish to achieve from their practice is discernible. The articulated objectives might not always correspond to the intrinsic ones, while for an accurate assessment of the outcomes clear objectives must be set (Henry et al. 2005). The ensuing alignment with teaching methods and means is a credit of pedagogical knowledge that should help educators shape and tailor EE to different socio-demographic groups of learners. The analysis also pinpointed that keeping more open, simple, supportive,

and interactive relationships with students regardless of the teaching approach employed is positively associated with their learning outcomes.

To boost and maintain the quality of experiential EE, experience-based pedagogy should be central to the training of educators. Content-wise, such a training programme has to incorporate ontological, axiological and epistemological standpoints of the social constructivist learning paradigm. It has to convey the teaching models framework with a particular emphasis on the curriculum, methodology and evaluation dimensions as a useful approach for aligning didactic and pedagogical choices. Trainees should be able to gain a comprehensive contemporary understanding of what experience-based pedagogy is, its theoretical underpinnings and how to integrate these into EE courses, what teaching and assessment methods to choose, and how to combine them in a coherent way. In light of the obtained results, it is particularly important to clear up the compatibility between action and reflection-based learning at various stages of the experiential EE process.

To sum up the recommendations for decision-makers at HEIs and entrepreneurship educators, the recipe for implementing experiential EE should comprise the following “ingredients”:

- a) train and recruit educators qualified in entrepreneurship and/or pedagogy as well as with an extensive professional network;
- b) enrol pre-motivated students with high entrepreneurial proclivity and, if applicable, some experience in entrepreneurship;
- c) based on the outcomes targeted, adopt reliable and valid measures of EE outcomes, and establish their level before an intervention;
- d) expose the students to a well-planned intervention worth 16–18 ECTS;
- e) assess the levels of outcomes afterwards, and track career paths of alumni.

8.4.2 For other EE stakeholders

The findings of this study also make it possible to derive possible implications for local policy makers, prospective entrepreneurship students and EE scholars.

Policy makers: connecting the dots

The Estonian and Latvian economies obviously have less financial resources than more prosperous neighbours in the Central Baltic region (e.g. Finland and Sweden) or beyond (e.g. Netherlands and United Kingdom), where EE has been prioritised in the state education policy for a number of years. At the same time, prioritisation does not necessarily imply extra funding. The interviews with the Estonian

educators confirmed that EE is currently being actively promoted at the government level and concrete measures are being taken to integrate the discipline more firmly into higher education. Yet, these steps are taken with minimal investments mobilising the institutional resources at hand, including personnel; at least, the educators keep pointing out on the lack of specialist funding. In these conditions, Latvia seems to be slightly lagging behind its northern neighbour – EE has not been actively lobbied in Latvian political circles, and is still sometimes treated as part of management education. Changing the course of rhetoric in this respect becomes a matter of keeping abreast with pan-European priorities. Prioritisation of EE is a top-down initiative, but, as in Estonia, it could provide momentum to more active bottom-up EE development schemes that tend to use existing human resources and attract extra funds from EU projects as well as local successful entrepreneurs.

The on-going tendency to launch incubators at nearly every prominent HEI in Latvia looks dubious in the current context of market contraction and downsizing of the student population. A much more worthwhile investment would be in training educators in entrepreneurship pedagogy, involving them in thematic international-level projects and cooperation, including research. The second level priority rests with EE ecosystem development, especially university-industry-government cooperation platforms. These are areas where the state support could prove to be very valuable.

An increasing number of local HEIs should have started forming alumni associations and track the career paths of graduates. As part of this, each school could incorporate a system of measuring the outcomes of EE. The system could be either adopted at the country level or at each HEI separately. Currently, within the framework of the agreement of the Ministry of Education and Research in Estonia and the local universities, the volume of EE intervention has increased but no specific system of measuring the outcomes has yet been adopted.

The findings of the study question the overall quality of experiential EE. Yet, prior to stimulating a further shift towards more experiential learning or cutting the expenditures abruptly, it is necessary to reveal what drawbacks the current implementation of EE has in order to counter them in the future.

Prospective students: “why study?”

Prospective students who choose where to study entrepreneurship are prone to be most confronted with the research findings. Indeed, why study entrepreneurship at school rather than throw the cash right on the table and start your own company? In all likelihood, genuine education starts when formal education ends. Admittance

of this universal truth does not really undermine the subtle value of EE. Considering the high chances of failure and huge amount of young “puff entrepreneurs”, education provides more substance for learning from the mistakes of others, and one’s own situational “costless” failures even if the direct contribution of EE is not captured statistically. Furthermore, the learning process in a discipline one aspires to acquire fosters self-discovery and self-appropriation. At the age of 18–23, most young people are still building the foundations for life, and the companies they start a decade or two later would certainly differ from those they contemplate in their twenties (Mochari 2016). Formal education either predominantly traditional or experiential broadens one’s mind. Generally speaking, studying entrepreneurship is never an “all-or-nothing” experience. Most of contemporary courses comprise both boring and fun parts; yet, which school to select?

In the best-case scenario, the suggestion is to find an offering with longer interventions, either a set of interconnected courses or a full study programme. The latter would be challenging to find in the Baltics, in which case it is advisable to aim for an international master’s programme in entrepreneurship following completion of the first cycle. In the meantime, bachelor education can establish the generic intellectual basis that if complemented with one or two interdisciplinary elective activities should be sufficient for further learning as well as the first job. If a school’s reputation does not concern students as much as how high the fees are, in principle, it does not matter which HEI to go for. If the reverse is true, then HEI C is the smartest choice in the region.

Scholars: avenues for further research

In a nutshell, the monograph strongly recommends against taking the widely accepted assumptions for granted. The success of EE in general and of experiential EE in particular proxied through graduate learning and objective outcomes is apparently conditioned upon EE intervention design and delivery, and the socio-demographic and contextual factors accompanying it.

Apart from considering prior motivation and controlling for prior experience and aspirations, future studies of venture creation programmes can benefit from establishing an initial level of personal predisposition towards entrepreneurship as a career path through objective forms of measurement (business games, case studies, observations of role plays, situation analysis, etc.) and tracking the changes in the respective measures during and after the interventions. In more generic EE interventions, one can apply the GET and ATE tests or other verified scales. In the first case, measurement should focus on behavioural and cognitive aspects of the

entrepreneurial potential; in the second case, measurement should focus on the affective aspects and personality of the learners. The longitudinal research of the associations between entrepreneurial knowledge and skills acquired during EE and the professional life of graduates would contribute more specifically to clarifying the extent to which education matters.

The novel empirical evidence on the outcomes of EE presented in this study is positioned as a local phenomenon, but it may well also be that what is commonly regarded as a progressive educational movement does not yield the expected outcomes because of the weaknesses of its implementation or related contextual factors at other European universities or business schools. This calls for further research in leading EU economies and cross-country comparisons to confirm the deduced problems and to remedy them in the observable future. There certainly are multiple ways to implement experiential EE, given the diversity of methods and sub-types of experience-based pedagogies. This, in turn, demands on-going pedagogical trials and systematic evaluations of the expected outcomes to identify effective teaching tactics for different socio-demographic groups of learners.

The study leaves at least a couple of questions still open for further research. It remains uncovered how the availability of EE infrastructure supports entrepreneurial learning and to what extent it fosters graduate entrepreneurship. The contention yet to be tested is that the infrastructural influence should be exemplary given the magnitude of investments (other factors being equal). In addition, a study of how mixing different age groups works in the EE process would be beneficial. The education system has assumed for long time that same-age individuals study better together. Likewise, same-sex education was also prevalent many years ago but has now become outdated. As long as the bold and innovative educational strategies work, they are welcome.

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ANNEXES

Additional information on data collection

Annex 1a Study programmes of the Estonian respondents

HEI	Programme/Specialisation title	No. of respondents	% of the HEI total
A	Business Administration (Open University)	17	21.8%
	Business Administration (in English)	1	1.3%
	Economics	50	64.1%
	Other (Mixed: Enterprise Management, Economics and Business Administration, Entrepreneurship and Project Management)	10	12.8%
			78
B	International Business Administration	1	4.0%
	Business	23	92.0%
	Finance and Accounting	1	4.0%
		25	100.0%
C	International Business Administration	20	52.6%
	Entrepreneurship and Business Management	11	29.0%
	Languages and Business Administration	5	13.2%
	Other (Finance Management)	2	5.2%
		38	100.0%
D	Entrepreneurship and Business Administration	46	59.7%
	Management	15	19.5%
	Finance	5	6.5%
	Tourism	2	2.6%
	Logistics	1	1.3%
	Marketing	8	10.4%
		77	100.0%

Annex 1b Study programmes of the Latvian respondents

HEI	Programme/Specialisation title	No. of respondents	% of the HEI total
E	Enterprise Management	32	45.7%
	Finance	38	54.3%
		<i>70</i>	<i>100.0%</i>
F	Enterprise Management	78	56.1%
	European Business Studies	22	15.8%
	E-Business	4	2.9%
	Business Psychology	2	1.4%
	Public Relations and Advertising Management	32	23.0%
	Other (Economics and Business Administration)	1	0.7%
		<i>139</i>	<i>100%</i>
G	Economics	37	41.6%
	Finance	38	42.7%
	Marketing	14	15.7%
	Entrepreneurship	16	18.0%
	Other (Mixed: Entrepreneurship and Marketing, Business and Economics, Marketing and Finance, Management, etc.)	15	16.9%
			<i>89</i>
H	Enterprise Management	25	58.1%
	Economics	8	18.6%
	Finance	2	4.7%
	Other (International Economic Relations, International Economics and Commercial Diplomacy)	8	18.6%
			<i>43</i>

Annex 2 Interview protocol

Initial data about a respondent

Name, surname:

Institution:

Position:

1. Introduction

1.1. For how many years have you been teaching entrepreneurship?

1.2. What is your primary teaching interest and area of expertise in entrepreneurship?

- SMEs, “breeding gazelles”, large enterprises, emergence and growth of enterprises, general management, leadership, marketing, finance, accounting, strategy, innovation, international business, organisational behaviour/human resources, other...

1.3. How old are you?

1.4. What is your typical target audience (age, main field of study, practical work experience)?

- level: vocational school, undergraduate, postgraduate, lifelong learners
- background: business, non-business
- if non-business – from what fields (design, physics, biology, etc.)
- if business – do you teach entrepreneurship to non-business students and how often?

1.5. Do you have experience in entrepreneurship (and/or business management)? If yes, what industry background do you possess? Please describe briefly (including number of years in).

- Business consultant, (small or medium) business owner
- Corporate executive/director
- Entrepreneur
- Venture capitalist
- Other...

1.6. What is your favourite definition of entrepreneurship?

2. Methodology

2.1. What teaching/training methods do you usually use in practice?

- Entrepreneurial process-based approach, traditional academic approach, team academy, case-based methodology, problem-based and experiential learning, others... (role-playing, group discussions/presentations, creativity exercises, problem solving, workshops via internet, group projects, self-directed learning, consultancy/mentoring exercises, student research projects, experience exchange, group diagnostics, “live” cases, business plan competitions, elevator pitches, advisory clinics, film & video reporting, company visits, research papers, business & investment games, field studies, student consulting project with companies, distance & online

learning/computer conferencing/small group work; placements, internships, mentoring, job shadowing, fieldwork, pre-course experience, pedagogical drama, learning diaries...) Please, describe briefly.

- How many hours you lecture and use other methods (in %)?
- 2.2. What other teaching/training methods are you familiar with/heard of, but do not use yet... Why? What are the obstacles to using these methods? How would you suggest overcoming these obstacles?
- 2.3. What kind of teaching/training methods do you consider the most effective in your practice? Please give some indicative examples.
- 2.4. What kind of teaching/training methods do you consider the most effective for yourself to enhance your entrepreneurial teaching/training competences? Are there the new ones you would like to try out?
- 2.5. How do you develop your entrepreneurship teaching/training options?
- 2.6. Does your institution organise additional educational programmes for training EE personnel?
- How often do you participate in entrepreneurial team trainings or other activities that enhance your teaching/training potential?
- 2.7. Do you invite (other) practitioners to your classes? Could you please provide some bright examples?
- 2.8. What kind of activities outside classroom have your students been involved in recently?
- 2.9. What kind of activities outside classroom have you been involved in recently?
- Technology or knowledge transfer, student clubs, student conferences, incubators/science parks, internships or projects with start-ups, industry publication, business plan competitions, coaching start-ups...
- 2.10. Do you cooperate with companies to improve your teaching/training practice (e.g. with joint industry-based projects)?
- If yes, please describe, how, in what way (R&D, mobility of students, mobility of academics, commercialisation of R&D results, curriculum development and delivery, lifelong learning, entrepreneurship, governance...)
 - If no, why?

3. *Evaluation*

- 3.1. How do you usually assess students/trainees?
- Standard grading (using 10, 5 or other points scale), pass/not pass; let your students undertake assessment themselves (also in groups); marking is a formal procedure in classes, and you tend to critically reflect on students' achievements or flaws in learning/training; mistakes are part of learning, and you mostly assess students' ability tackle their mistakes...
- 3.2. Do you differentiate and/or modify these assessment methods? How?
- 3.3. What is your view of your students'/trainees' recent progress?
- 3.4. What are the assessment methods you have heard of, but do not use yet? Why?

3.5 Do you measure EE outcomes in the short- and long-term? Does this kind of measurement system exist in your institution?

3.6 Do you consider feedback from students for improving your teaching/training? Please give some examples.

4. *Curriculum*

4.1 What are the main objectives of your teaching practice (in entrepreneurship)?

4.2 What are the main expected outcomes of your entrepreneurial training/teaching?

4.3 How well do you make sure you achieve these objectives and expected outcomes?

- If you see potential for improvement then what are current obstacles for getting highest results? What are the solutions, from your viewpoint?

4.4 Do you participate in creating/renewing the EE curriculum according to which you are teaching/training students?

4.5 How do you structure topics you teach within the entrepreneurship course?

4.6 Do you use (interdisciplinary) teamwork as part of the teaching/ training process? If yes, how do you form the teams? Please elaborate briefly.

4.7 How many academic hours (contact and self-study) does your course provide and how many ECTS points are granted for passing the course?

5. *Social environment*

5.1. Do your students act proactively during classes and engage into activities you initiate?

- are students ambitious, initiative, creative?

5.2. What are the main obstacles that arise between you as a teacher/trainer and your students in the training process?

- communication, attitude ...
- how do you suggest overcoming these obstacles?

5.3. Do you try to ensure your students practice and solve real-life problems during your entrepreneurship course and, if yes, how? What is your experience of creating authentic entrepreneurial atmosphere during classes?

5.4. Do you bring your own entrepreneurial experiences into classes? How?

5.5. Do you incorporate “fun factor” to your classes? What is the difference between general aspiration of students to be entertained and methods of “fun” learning consciously used by a trainer (how to draw a line between)?

5.6. How would you describe your institution's management general attitude to new entrepreneurship teaching initiatives?

6. *Physical environment*

6.1. Do you develop your own materials or use the ones provided by a school/institution?

6.2. How do you perceive appropriate renewal of teaching materials?

- concept vs content...

6.3. Do teaching materials you use help you to achieve the teaching/training goals?

6.4. Do you use distant teaching technologies and/or specific software solutions in your practice? Please, describe briefly.

- e.g. e-lectures, business planning software...

6.5. Which teaching technologies and/or software you heard of, but have not used yet?

6.6. Are you satisfied with the physical space/rooms you meet with your trainees/students and use for teaching/training?

6.7. How would you improve technological equipment for teaching/training purposes you have at your disposal?

7. *Regulations*

7.1. What is the role of EE in the education policy of your country?

- relations to the HE standard; entrepreneurship as a profession not science; supportive/unsupportive regulation

7.2. What is the status of entrepreneurship courses in curricula in your institution?

- compulsory, elective, free elective

7.3. How is EE institutionalised in your institution? (Who is teaching entrepreneurship? Special structural units or standard faculties?)

8. *Financing*

8.1. How is EE financed in your institution (vs. other disciplines and/or institutions)? Is it foreseen that the allocated budget changes?

8.2. Do you see a need for changing the way EE financing is structured (ratio between teachers' salaries, investments in equipment, international/cross-border projects, other?)

9. *Final questions*

9.1. What is your vision of "ideal" approach to EE? Does this vision conflict with reality? If yes, how and why, in your view?

9.2. Are there any support structures, where students can get assistance from, after/while completing the entrepreneurship course in your institution?

9.3. Could you please tell us about EE best practices in your country? How do you tackle existing problems?

Thank you for cooperation!

Annex 3 Questionnaire administered to recent and imminent graduates from Latvian and Estonian HEIs

Block 1. Objective outcomes

Q1 As far as your occupation is concerned, are you currently self-employed, in paid employment or without a professional activity? (Feel free to mark 2 answers, if applicable.)

- Self-employed
- In paid employment
- Without a professional activity (not working and/or full-time student only)

I. SELF-EMPLOYMENT

Q2 Which type of self-employment best describes your current occupation? (Multiple answers are possible.)

- Professional (accountant, consultant, etc.) without employed staff
- Professional with employed staff
- Owner or co-owner of an enterprise with no more than 3 employed people
- Owner or co-owner of an enterprise with over 3 employed people
- Owner or co-owner of several enterprises with employed staff
- Other _____

[for self-employed professionals with staff]

Q2a How many staff members do you have as the self-employed professional?

[for self-employed professionals with and without staff]

Q2b As a self-employed professional, are you a sole freelancer, subcontractor or contractor in a bigger company?

- Sole freelancer
- Subcontractor
- Contractor
- Other _____

Q2c What is the core area of your economic activity as the self-employed professional? (according to NACE classification, multiple answers possible)

[list of 21 activities as per the NACE classificator]

II. PAID EMPLOYMENT

Q3 Which type of paid employment best describes your current occupation? (Multiple answers are possible.)

- Professional (employed accountant, consultant, lawyer, etc.)
- General management, director, top management
- Middle management
- Civil servant
- Specialist
- Office clerk
- Skilled manual worker
- Other _____

III. WITHOUT A PROFESSIONAL ACTIVITY

Q4 What activity are you currently occupied with?

- I am a homemaker
- I am a student
- I am a job seeker
- Other _____

IV. SELF-EMPLOYMENT → PRIVATE VENTURE CREATION (owners or co-owners in Q2)

Q5 How many new enterprises have you established before and/or after graduation?

Before graduation

After graduation

Q6 When did you establish your enterprise(s)? Please indicate the year(s).

->Open question

Q7 What is the core activity of your enterprise? (according to NACE classification)

->List of answers as in Q2c

Q8 Has your enterprise introduced new or significantly improved:

- goods or services to the market? (user friendliness, new components, software, etc.)
- processes to produce or supply goods? (distribution production method or support activities)
- forms of organization, business structures or practices aimed at internal efficiency and effectiveness? (changed corporate strategy, new management techniques, marketing tactics, etc.)

Q9 How many employees does your (biggest) company have?

->List of responses

Q10 Has your company reported an accounting profit within the period of existence?

- Yes
- No
- Not applicable

Q11 What is your current annual turnover? (in EUR)

->List of responses (incl. "no answer")

Q12 Would you like your company:

- to be as large as possible?
- to be of a size you can manage yourself or with a few employees?
- hard to say.

Q13 Have you discontinued any enterprise(s) that you, alone or with others, started?

- Yes
- No

Q14 What was the most important reason for quitting?

- An opportunity to sell the business
- The business was not profitable
- Problems getting finance
- Another job or business opportunity

- The exit was planned in advance
- Personal reasons
- An incident
- Other _____

Q15 Did you work for other employer(s) before starting own enterprise?

- Yes
- No

V. PAST AND NASCENT ENTREPRENEURSHIP (in paid employment or without a professional activity in Q2 or self-employed professionals)

Q16 Did you establish own enterprise in the past?

- Yes
- No
- Not applicable

Q17 Are you, alone or with others, currently trying to start a new venture?

- Yes
- No
- Not applicable

Q18 How likely is it that you will start a new enterprise in the next 10 years?

- Very unlikely
- Unlikely
- Undecided
- Likely
- Very likely

VI. EMPLOYABILITY (in paid employment or Q15 positive)

Q19 How many employers have you worked for in total?

-> Numerical list of responses

Q20 How quickly did you enter into your 1st employment contract, if calculated from the moment you started looking for a paid job?

- Within 1 week
- Within 1 month
- Within 3 months
- Within 6 months
- Within 12 months
- Within over 12 months

Q21 What was the shortest and longest period of these employment contracts? Please indicate the length of the shortest and longest contracts in days, months or years {decriptive variable}.

The shortest:

The longest:

Q22 Throughout your employment history, have you been promoted to higher and/or more responsible positions?

- Yes

- No
- Do not know

Q23 What is your average monthly income at present? (in EUR) {decriptive variable}

-> Numerical list of responses (incl. "no answer")

Q24 How satisfied are you with the *content* of your current work?

Q25 How satisfied are you with your current work *income*?

- Very Dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

Q26 Please recollect the most significant new activity you were actively involved with for your main employer. Was this activity initiated by yourself, your employer, or one or more colleagues?

- Myself
- My employer
- My colleague(s)
- It was a joint effort
- Hard to say
- Do not know

Q27 How many managerial positions have you undertaken in total?

-> Numerical list of responses

Q28 Can you think of new ideas in your everyday job that can be put into action?

- Yes, I am full of new ideas
- Yes, I have some new ideas
- I have only few ideas
- I can hardly think of new ideas
- I have no new ideas

Q29 Please assess the degree of your influence in decision-making at work in the company on a scale from 0 to 4.

Q30 What share of the working activity content in the company can you control yourself?

-> List of responses: >80%, 60-80%, 40-59%, 20-39%, <20%.

VII. INTRAPRENEURSHIP (in paid employment or Q15 positive)

Q31 Are you, alone or with others, currently trying to start a new venture or subsidiary for your employer?

- Yes
- No
- Do not know

Q32 Are you currently involved in launching a new product/service line for your employer?

-> List of responses as in Q31

Q33 Did you start a new venture or subsidiary for your employer in the past? (displayed for Q15 positive and self-employed professionals who had been employed)

-> List of responses as in Q31

Q34 Did you launch a new product/service line for your employer in the past? (displayed for Q15 positive and self-employed professionals who had been employed)

-> List of responses as in Q31

Q35 The first phase of such activities is usually an idea development. This includes, for example, active information search, brainstorming and submitting your own ideas to management. Have you been actively involved in this phase? (Q35-38 displayed for Q31-34 positive)

-> List of responses as in Q31

Q36 Have you had a leading or a supporting role in this phase?

- Leading
- Supporting
- Do not know

Q37 The second phase concerns preparation and implementation of a new activity. This includes, for example, promoting your idea, preparing a business plan, marketing the new activity or finding financial sources and acquiring a team of workers. Have you been actively involved in this phase?

-> List of responses as in Q31

Q38 Have you had a leading or a supporting role in this phase?

-> List of responses as in Q36

Block 2. Learning outcomes

I. GENERAL INFORMATION

Q39 Has entrepreneurship been a compulsory course of your study programme?

- Yes, compulsory
- No, an elective or free elective
- I have not studied entrepreneurship at the higher education level
- Other _____

Q40 Please select and/or specify activities you took part during your entrepreneurship course:

- | | |
|-----------------------------------|---|
| lectures | fishbowls |
| discussions | inter-disciplinary teamwork |
| case studies | guest lectures by practitioners |
| real-life problem solving | business planning |
| pitching business ideas | business modelling |
| internships (practice at work) | simulations |
| real-life projects with companies | business games |
| creativity exercises | business competitions |
| scientific discussions | entrepreneurship labs or camps (e.g. Garage 48) |
| mini-companies | working with mentors |
| pre-incubation or incubation | job shadowing |
| international exchange programmes | other |

Q41 Have you studied full- or part-time at the bachelor level?

- Full-time
 Part-time
 Other _____

II. EDUCATORS

Q42 Could you please characterise attitudes with your entrepreneurship educators in the study process, using the scale below?

- Open - - - - - Closed
 Simple - - - - - Complicated
 Supportive - - - - - Indifferent
 Equal - - - - - Hierarchical
 Interactive - - - - - Formal

Q43 Your teacher of entrepreneurship is (has been) a/an: (multiple answers possible):
 Presenter / Expert / Instructor / Coach / Facilitator / Mentor / Fellow learner / Other

III. PRIOR COMPETENCES

Q44 Did you know about entrepreneurship before attending the educational course or programme?

- I knew nothing
 I knew a little
 I knew something
 I knew a lot
 Hard to say

Q45 Did you have experience in entrepreneurship before attending the educational course or programme?

- I had no experience
 I had small experience
 I had some experience
 I had vast experience
 Hard to say

Q46 Did you have work experience before entering the higher education institution to do your bachelor?
 -> List of responses as in Q45

Q46a What position did you hold and for how long (in months or years)?

Q47 Did you want to become *an entrepreneur* before entering into the educational course or programme in entrepreneurship?

- Definitely yes
 Probably yes
 Maybe
 Probably not
 Definitely not

Q48 Did you want to become *a manager* before entering into the educational course or programme in entrepreneurship?

-> List of responses as in Q48

IV. COGNITIVE, SKILL-BASED AND AFFECTIVE OUTCOMES

Q49 During your entrepreneurship course or programme, have you learnt new information that you did not know at the beginning of the course about the topics listed below? (Please use the dropdown list to answer.)

Learned nothing new (1)	Integrated marketing communications (1)
Was exposed to topic (2)	General principles of financial accounting: how a cash flow, income statement and balance sheet of a firm are devised (2)
	Theories of entrepreneurship (3)
Learned some basic facts about it (3)	Entrepreneurship process (4)
	Business plans and its constituents (5)
	Legal aspects of establishing a new enterprise (6)
Learned a moderate amount of new info (4)	Business modelling (7)
	Development of new products and services (8)
	Opportunity recognition (9)
	Attraction of financing (10)
Gained extensive new knowledge of the topic (5)	Project management (11)
	Lean start-ups (12)
	Business communication (13)
	Team management (14)
	Positioning and branding of products and services. (15)
	The role of entrepreneurs in our society and economy (16)
	Evaluation of business opportunities (17)

Q50 Can you do things now that you could not do at the beginning of the course? Please select the response that best describes your level of improvement:

No improvement	Write a business plan. (1)
	Resolve conflicts. (2)
Made one or two minor improvements	Work out a marketing plan. (3)
	Identify and analyse risk. (4)
Made some improvements	Be a valuable team-member. (5)
	Work across teams and functions. (6)
Made substantial improvements	Work with others who are different from me. (7)
	Lead a team. (8)
	Deal with uncertainty, adapt to new and uncertain situations. (9)
Can now perform very well	Conduct a market research. (10)
	Negotiate deals with other businesses. (11)
	Set priorities and focus on realistic goals. (12)
	Solve creative business problems. (13)
	Organise and control on-going projects. (14)
	Develop new products and services. (15)
	Build up professional networks. (16)
	Evaluate pros and cons of business ideas. (17)
	Identify unmet needs of people. (18)
	Keep good interpersonal relations. (19)
	Prepare a cash flow for a firm. (20)
	Manage business risks. (21)
	Develop innovative working environment. (22)
	Attract potential investors to my endeavours. (23)
Devise profitable business models. (24)	

Q51 Please indicate the extent to which you agree with the following statements:

Strongly disagree	I always try to find innovative solutions to arising or existing challenges. (1)
	I want to start a new/one more enterprise. (2)
Disagree	Among various options, I would rather be an entrepreneur. (3)
	To be an entrepreneur and have own company is my true passion. (4)
Neither agree nor disagree	A career as an entrepreneur suits me well – it gives more freedom and autonomy. (5)
	I am confident in my ability to start a new enterprise. (6)
Agree	I can rely on myself in <i>any demanding</i> situation. (7)
	I am sure I can be a good leader of a team. (8)
Strongly agree	I like taking business risks – it excites me! (9)
	I tend to take my chances, even if I might fail. (10)
	I can rely on myself in <i>any uncertain</i> situation. (11)
	For me, failure is a valuable outcome of the process of doing. (12)
	Usually I set ambitious goals to myself. (13)
	I want to achieve more than most other people. (14)
	It is vital for me to grow and develop constantly. (15)
	I openly question how things can be improved. (16)
	I perceive myself as a creative person. (17)
	I am keen on new learning. (18)
	I appreciate professional guidance from more experienced people. (19)
	I am enthusiastic about generating new ideas and recognising new opportunities.
	I am always trying to be alert to new ideas and opportunities that come to my mind.
	I feel self-confident when talk to successful entrepreneurs. (22)
I always make my best effort to convince other people in my ideas. (23)	
My professional goal is to be an entrepreneur. (24)	
At any work I prefer to lead key processes myself. (25)	
I will make every effort to start a new enterprise, when aspired. (26)	

Block 3. Background of the respondents

Q52 When where you born?

->list of years

Q53 Please indicate your gender: male/female

Q54 Did you complete your bachelor degree?

Yes/No

Q54a When did you complete your bachelor? (if yes in Q55)

Q54b Are you currently doing your Master's degree? (if yes in Q55)

Q54c When do you expect to complete your bachelor's degree? (if no in Q55)

Q55 Where have you completed/are you doing your bachelor's degree? Please mark your institution.

-> list of answers

Q55a Please mark your study programme (for some HEIs)

Q55b Please mark your specialisation (for one HEI)

Q56 Has your mother or father been an entrepreneur?

Yes, father

Yes, mother

No

Q57 Does any of your parents occupy managerial positions at work?

Yes, father

Yes, mother

No

Q58 How would you assess contribution of university education into your professional life, using the scale from 0 to 9, where 9 signifies the highest contribution, and 0 – no contribution?

-> numerical list of answers

Q59 How many entrepreneurs are in your social environment?

-> list of answers

Q60 Do you want to have a chance to be rewarded for participation in the survey?

Yes/No

Q60a Please enter your contact details (if yes in Q60):

Name, surname, e-mail and/or phone

Annex 4 Content analysis: overview of the procedure

The content analysis consisted of two coding stages: the initial and focused coding. At the initial coding stage, the data were auto-coded so that to organise all the information on every dimension and sub-dimension in one place as shown in Figure 1 below. The responses of each educator about, for instance, main teaching objectives were compiled under the “Main objectives” sub-node of the curriculum dimension, and the main node that also aggregated the data from its sub-nodes (note the number of sources and references). Next, using the auto-coded educators’ responses, focused coding was performed. This involved manual creation and arrangement of new nodes to reduce the data and to find or display patterns through coding queries, charts, and visual models. Figure 2 illustrates an excerpt from this process, where two new nodes “Entrepreneurship is...” that refers to defining the phenomenon by the educators and “Teaching methods used” were created. The latter is sub-divided into country nodes and concrete methods as well as a separate sub-node storing all the responses about the estimated proportion of theory and practice at the respective courses. Classification of the educators based on the descriptive information (HEI, years of experience in pedagogy and entrepreneurship, etc.) enabled in-depth comparisons of their responses using coding queries and the other aforementioned functions.

Name	Sources	References
Introduction	16	113
Methodology	16	160
Evaluation	16	112
Curricula	16	144
Main objectives	16	16
Main outcomes	16	16
Achievement of outcomes	16	16
Other expected outcomes	16	16
EE curriculum renewal	16	16
Structuring topics	16	16
Interdisciplinary teamwork	16	16
Hours and ECTS	16	16
Social environment	16	112
Physical environment (equipment)	16	128
Regulations	16	96
Financing	16	48
Final questions	16	64

Figure 1 Nodes and sub-nodes of the auto-coding in NVivo

Name	Sources	References
Entrepreneurship is...	17	50
Teaching methods used	15	98
Estonia	8	47
Latvia	7	39
Lectures and seminars	4	14
Situation analysis	2	4
Group work	3	3
Presentations	3	3
Business games	2	3
Business planning	1	1
Case studies	4	6
Business plan competitions	1	1
Company visits	1	1
Creativity exercises	2	2
Problem-based learning	2	3
Simulations	1	1
International online projects	1	1
Business modelling	1	1
Lectures vs other methods	9	12

Figure 2 Excerpt from the focused coding process in NVivo

Annex 5 Summary of qualitative findings in the Estonian sample

Along the general lines of findings, there is a slight mismatch between the teaching aims set, outcomes expected as well as methods used at HEI A, B, and D. While aiming at developing entrepreneurial knowledge and beliefs of students, John tries to teach from a more practical angle even when lecturing. He is also one of the few who uses reflections as teaching method. At the same time, the educator does not expect any outcomes from his practice and in the end supposes that his students “do not take away much”. Rob, while intending to demonstrate that everyone can be an entrepreneur, employs somewhat traditional teaching methods and expects his students to get well-paid positions in existing companies. Similarly, Matthew who aimed to increase understanding of what it means and takes to be an entrepreneur was using predominantly traditional methods back then, even though this aim is fully achievable in the modes of learning “through” or “for” entrepreneurship.

A widespread feature of the “Curriculum” dimension is the lack of interdisciplinarity. All learning groups consist of students with business education background that presumably limits opportunities of entrepreneurial teams in leveraging competences of one another.

The educators tend to report the prevailing use of practical learning activities. However, there is an overwhelming emphasis on doing something other than listening to classical academic lectures. Only few educators, John, Leo and Hannah, referred to reflection as an important part of their teaching. The scope and depth of using experiential methods thus varies. Figure 3 gives an overview of teaching methods employed by the Estonian educators. If lectures and seminars are mentioned in all the HEIs, other methods are not evenly distributed. Inviting of acting entrepreneurs as guest lecturers is a popular method, but their deeper involvement into systematic workshops or seminars with students has not been practiced as well as other methods outlined in Figure 4 below that are mentioned by the educators themselves.



Figure 3 Teaching methods in use mentioned by the Estonian educators

Note(s):

(1) HEIs can be traced using the legend.

(2) Y-axis displays the total number of references to certain methods made during the coding process.

The lack of reflection on one's learning experiences is also visible in the evaluation methods used. Figure 5 illustrates this. Learner-centred interventions tend to incorporate formative and reflection-based assessments, because they induce sense-making on the part of learners rather than just completing a requested task, be it a case study or a joint project with an existing company. This type of evaluation used for the sake of learning is very rare, found only at HEI A and HEI C.

The local HEIs do not apply any systematic measurement of the EE outcomes, which is quite surprising (see Table 1). Course feedback as well as alumni surveys tend to give very general information, whilst educational assessment calls for more precise metrics. Adoption of a measurement system becomes even more topical along with a shift towards experiential interventions across Europe. Either way, measuring outcomes of EE specifically would help detecting worrying trends if any and counteract them accordingly by enhancing the on-going performance.

In terms of regulatory support, EE is one of the top priorities of the education policy in Estonia at present. The discipline is well-embedded into the curricula of the local business schools or respective faculties at universities having the compulsory status. However, the educators from the two state financed schools in the sample (HEI A and B) as well as one private school (HEI D) reiterate that there are not enough funds available for the EE development including viable salaries for teaching. Limitations in funding sequentially prevent creation of the EE infrastructure. On the other hand, even if the funds were invested from an external source, either the EU or the local government, it would remain questionable whether the educators having the current level of expertise in experiential approach to teaching would be qualified enough to benefit from this right away. It is more likely that they would gain more from further professional development trainings in experience-based pedagogy at first.

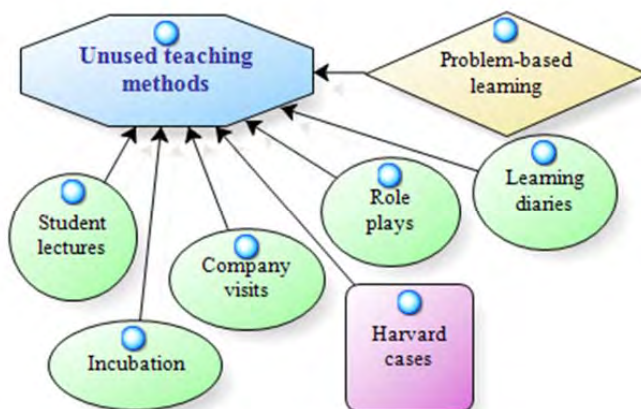


Figure 4 Teaching methods the Estonian educators are familiar with, but do not use

Note(s):

(1) Ellipses and circles display answers from HEI A, rounded rectangle – the answer from HEI C, diamond – from HEI D.

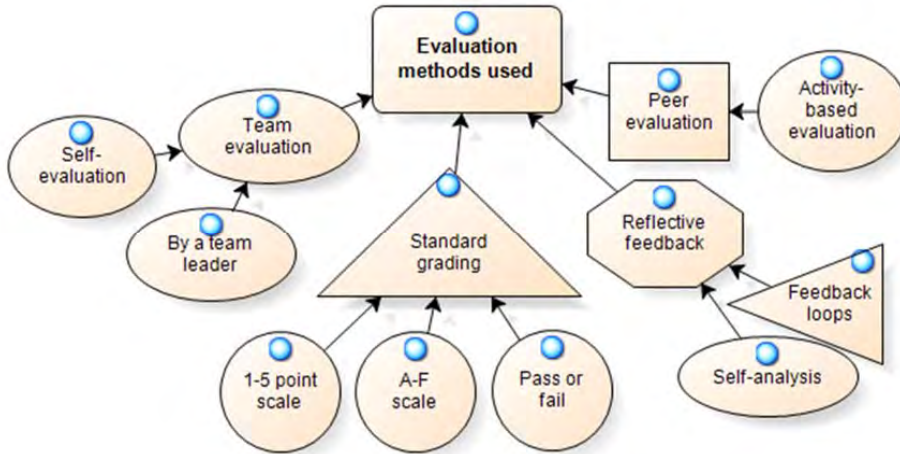


Figure 5 Evaluation methods used by the Estonian educators

Note(s):

(1) Ellipses display answers from HEI C, rectangle – HEI B, left triangle – HEI A, top triangle and circles denote answers applicable to the four HEIs.

Table 1 “Do you measure the EE outcomes in the short- or long-term?” (Estonian sample)

EE outcomes measurement	Categories identified through NVivo coding	Number of coding references	
	Confirmation	Alumni surveys	3
Enterprises founded		2	
Negation		No systematic measurement	5
		Only course feedback	2

The operational results obtained reflect the state of the ontological level. In HEIs B and D that are balancing between supply and supply-demand models, the educators rely more on the content, linear business planning and its components that trigger causal thinking. As a natural feature of this prevalingly “education about entrepreneurship” mode, an educator takes on a dominating role and fully determines the learning content. This kind of learning process leaves few options for an active, generative and wide role of a learner, yet being able to develop critical thinking. Therefore, the behaviourist and cognitivist learning paradigms prevail in HEIs B and D. HEI A, in turn, closest to the demand model in “the traditional range” already uncovers several elements of constructivist learning, particularly in using reflection as teaching method, building up support structures and provision of ad hoc mentoring as well as, to a certain extent, aiming to develop entrepreneurial personalities. Social constructivist EE prevails in HEI C that is visible in every internally influenced dimension. Furthermore, EE is enacted in a structured way, so that in the beginning students acquire theoretical basis and only then are “*let swim in the real world of business*”, practice effectual thinking as part of the study curriculum.

Annex 6 Summary of qualitative findings in the Latvian sample

Teaching aims the educators set vary clustering around four main themes: personality development, employment into managerial positions, increase of motivation towards entrepreneurship as a possible career choice, and competence development for entrepreneurship. In general, the aims set match the outcomes expected in the Latvian sample (Sarah makes the only exception). However, teaching methods chosen do not always match these aims. For instance, in HEI E, teaching takes place inside classrooms with the use of traditional and participative methods, while Sarah aims to develop competences to run and establish businesses successfully. Likewise, Chris aims to help determine personal fit with entrepreneurship, but how one can achieve this without experiencing entrepreneurial process? Furthermore, determination of the absence of this fit may demotivate from becoming an entrepreneur or even an entrepreneurial person that diverges with another aim of Chris – to increase motivation towards entrepreneurship. For the achievement of the latter aim it would be fair to provide students with positive opportunities to experience the process in authentic but controlled settings ensuring that failures are successful and that students learn from them. In HEIs F and G, Aaron, Jack and Dan do not set the ambitious aim to educate for entrepreneurship, but prioritise entrepreneurial personality development and increasing one's motivation to pursue career path in entrepreneurship. The range of methods applied by all means outruns HEIs E and H, albeit disbalances the coherence among the operational dimensions.

The general trend in employing more practice-based methods is similar to the Estonian sample alongside with the differing meanings assigned to “practice” and an excess emphasis on action at the expense of reflection that is even more salient in the Latvian sample. Figure 6 below outlines teaching methods in use mentioned by the Latvian educators. Lectures and seminars referred to most often comprise group work, situation analysis and presentations. In some cases the educators complement each other, e.g. in HEI F Alex does not use problem-based learning, while Aaron does a lot. Aaron invites his renowned colleagues to co-teach the course, and the method is also practiced at HEI G. Figure 7, in turn, shows the methods familiar to educators but not used. Notably, students at the most experiential HEI G do not do much reading on the subject due to the lack of time. Some methods remain unused on the ideological basis, e.g. case studies at HEI G and business competitions at HEI F, others due to the lack of expertise on their implementation, e.g. business games at HEI G, or environmental constraints such as simulations and interdisciplinary projects. The lack of interdisciplinarity remains a common concern for the “Curriculum” dimension, yet the discipline tends to be embedded into business-related programmes despite some terminological issues.

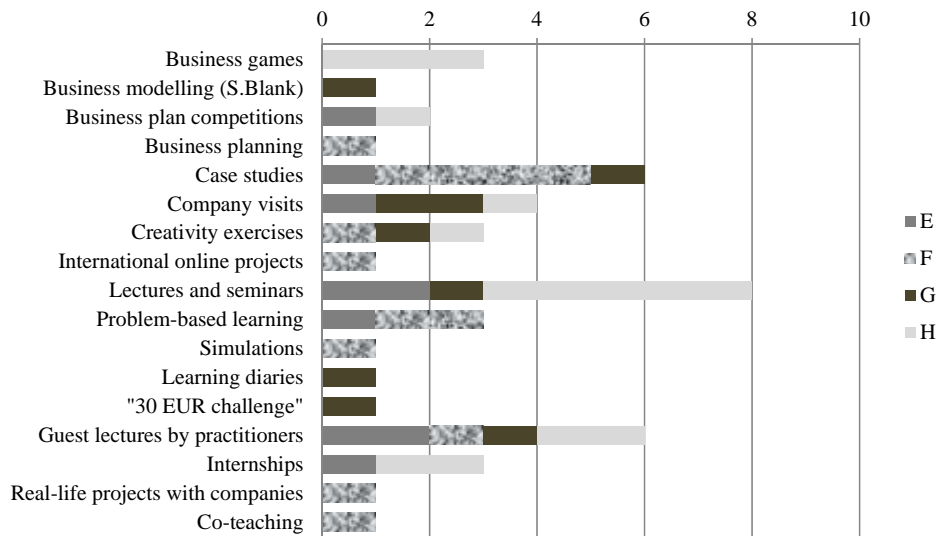


Figure 6 Teaching methods in use mentioned by the Latvian educators

Note(s):

(1) HEIs can be traced using the legend.

(2) Y-axis displays the total number of references to certain methods made during the coding process.

The range of evaluation methods employed tends to reflect insufficient learning from feedback or use of feedback loops through formative assessment (overview presented in Figure 8). Only Aaron (HEI F) refers to performance-based evaluation. Incorporation of reflective methods (i.e. student diaries) as part of learning is traceable at HEI G. Furthermore, absence of the systematic EE outcomes measurement is a common feature of all the HEIs in this dimension. HEI G stands out in more tight links with its alumni, HEI H gets to know about enterprises founded by some graduates, and in other cases information about career paths of alumni is occasional. See Table 2 for a summary.

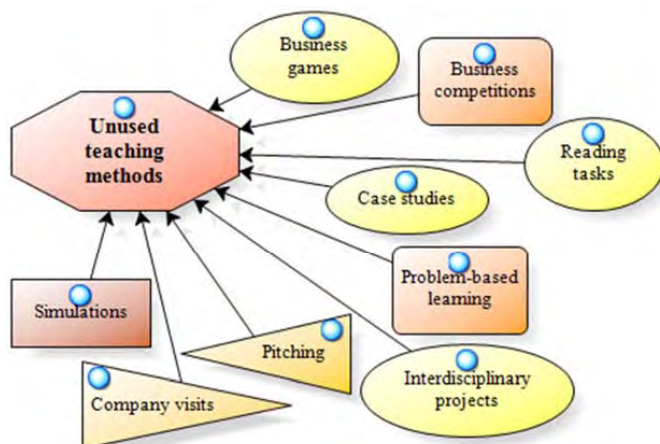


Figure 7 Teaching methods the Latvian educators are familiar with, but do not use

Note(s):

(1) Ellipses display answers from HEI G, rounded rectangle – HEI F, left and right triangles – HEI H, plain rectangle – HEI E.

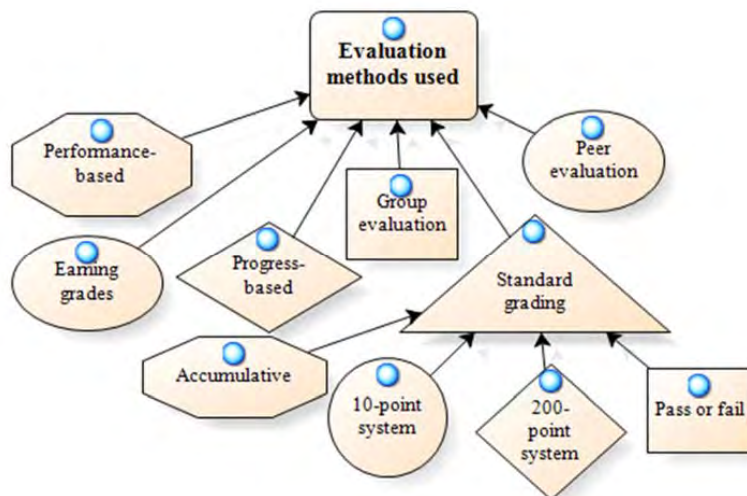


Figure 8 Evaluation methods used by the Latvian educators

Note(s):

(1) Ellipses display answers from HEI H, rectangle – HEI E, octagon – HEI F, diamond – HEI G, top triangle and circle denote answers applicable to the four HEIs.

Regulatory issues have a constraining influence on EE in Latvia. Not being among the key priorities of the state education policy, EE does not receive any targeted financing from the government. This finding confirms the known contextual specificities. The regulatory support, either external or internal (to the extent an institution can afford it) logically overlaps with environmental and ecosystemic issues. Institutionalisation helps building up the ecosystem and creating respective environment through entrepreneurship support centres, provision of extracurricular opportunities, university-industry cooperation platforms, etc. Thus far, only HEI G could afford active steps towards the experiential end of these external dimensions.

Table 2 “Do you measure the EE outcomes in the short- or long-term?” (Latvian sample)

EE outcomes measurement	Categories identified through NVivo coding	Number of coding references
	Confirmation	Alumni surveys
Enterprises founded		1
Occasional		2
At a starting phase		1
Negation		
	No systematic measurement	4

Extrapolating the operational findings to the ontological level uncovers teacher-centred and content-driven intervention at HEI E, a transitory state of HEI H between teacher- and learner-centred approaches; learner-, team-centred and process-driven interventions at HEIs G and F. Aaron, Jack and Dan purposefully refrain from being ordinary lecturers providing more space for students to experience entrepreneurial activities themselves. Self-discovery and self-appropriation, though implicit for the demand model and requisite for the competence model, seem to be insufficiently exploited at HEI G, where students are put into a situational context of experiencing entrepreneurship right away. Yet, in line with Béchard and Grégoire (2005b), the competence model at the most experiential end of the spectrum is built up on the interaction between the two previous models. This implies the students already have some prior knowledge about entrepreneurship and related entrepreneurial experience before entering the competence model. Unlike HEI C, where the structured approach is enacted, HEI G puts its students into socio-constructivist learning settings that demands effectual thinking with almost no prior preparation for that.

Annex 7 Comparison of the principal operational findings in the Estonian and Latvian samples of entrepreneurship educators

Dimensions	Similarities	Differences
<i>Curriculum and methodology</i>	<p>Aims-outcomes-methods mismatches.</p> <p>Experiential learning through the prism of action.</p> <p>Educators try to emphasise practical not theoretical learning, but understanding of the former varies.</p> <p>Absence of interdisciplinarity.</p> <p>Educators tend to consider methods they are using most effective.</p>	<p>Aims-outcomes better match in the Latvian sample.</p> <p>Estonian educators are slightly more confident in their toolbox of methods.</p>
<i>Evaluation</i>	<p>Lack of reflection.</p> <p>Prevalence of summative assessment methods.</p> <p>No systematic measurement of EE outcomes, but overall positive perceived achievement of expected outcomes and progress of students.</p>	<p>Estonian educators use reflections more often, also as a teaching method.</p>
<i>Environment</i>	<p>Ecosystemic support has strong ties with regulations and financing. Authenticity of learning is provided by pushing students outside classrooms, not by using the internal EE infrastructure.</p> <p>Overall positive attitude of the schools' management towards EE.</p> <p>Unsatisfactory quality of secondary education in general.</p>	<p>In Latvia, it is harder to get enterprises involved to cooperate.</p> <p>Latvian educators are less satisfied with the physical space for teaching.</p>
<i>Regulations</i>	<p>Entrepreneurship tends to be well-embedded into curricula.</p> <p>Presence of entrepreneurship support structures and availability of training initiatives for educators depends on internal funding and EU projects.</p> <p>Experience of educators in both pedagogy and entrepreneurship is not always among the recruitment criteria.</p>	<p>Entrepreneurship may still be titled "enterprise management" in Latvia.</p> <p>Prioritisation of EE in the state education policy in Estonia, but not in Latvia.</p> <p>"Incubation hype" in Latvia.</p>
<i>Financing</i>	<p>Insufficient funds for EE development and qualitative implementation.</p> <p>EU projects play a major role in financing EE.</p>	<p>Private schools implementing experiential EE have more resources.</p>

Extra details of statistical analysis

Annex 8 Preparatory works with the quantitative data

The survey in Estonia ran in two waves. The first wave returned 183 completed questionnaires, but fewer than anticipated usable responses from HEIs B, C and D. The second wave targeted these three institutions, and one more extra institution that provided a rather traditional EE for engineering students only. The inclusion of this school was useful to compare entrepreneurship graduates with business and non-business background. The number of unfinished questionnaires in the first wave equalled 51. Albeit the second wave increased the number of usable responses particularly from HEI D, it also brought 91 uncompleted questionnaires. Out of the total 142 partial responses with differing progress, over 45 could be used to validate the selection (depending on the variable). Therefore, the response rate in the Estonian sample was calculated using the sum of 51 and $\frac{1}{4}$ from 91 (since there is no information how many non-respondents were there per HEI). With respect to the extra HEI, approximately 490 invitations returned 29 valid responses.

The procedures necessitated in merging datasets from the two waves, and saving the main file with the four target HEIs and entrepreneurship graduates for further analysis (N=211) as well as the supplementary file with the extra HEI, few non-entrepreneurship graduates, and incomplete responses for preparatory comparisons (N=392). When marking their belongingness to the HEIs, some respondents from Estonia disregarded the available options and marked “Other”, still indicating one of the listed institutions (with HEIs B and D it was more often the case). These observations were re-coded manually in the datasets.

All the observations from Latvia were originally stored in one dataset. Since the survey came with the built-in force response, 99% of responses were fully present for the analysis. There were few exceptions, however, concerning the level of prior knowledge (N=303), entrepreneurship (N=301) and work experience (N=304), where the function was set slightly later than the survey had been launched. The same issue held for the data from Estonia. 10 observations were cleared out, because the respondents specified other local schools or provided no additional information on their alma mater. Similarly to the Estonian sample, two working files were saved – one with entrepreneurship graduates only (N=306), and another with all the observations and incomplete responses (N=408).

Validation of sampling

The aim of comparing completed and partially completed questionnaires is to see whether those, who made up the final sample, are somehow different from those who did not. The latter are then assumed to represent non-respondents. The questionnaire completion progress ranged from 10% to 60% for these individuals. Descriptive variables including information on HEIs were placed in the end of the survey; hence, it was unlikely to compare the two groups based on these criteria. Entrepreneurial intentions, nascent entrepreneurship, prior proclivity (or aspirations) to become an entrepreneur and prior knowledge about entrepreneurship, the variables directly relevant to the theme, were available instead. Location of these questions also differed in the Estonian and Latvian survey that is why there are more observations of non-respondents on some variables than in others.

The non-parametric Kruskal-Wallis test was used due to uneven number of observations between full and incomplete responses (e.g. N=212 vs. N=48 in the Estonian sample and N=341

vs. N=45 in the Latvian sample). The test showed no significant differences across the four variables in both samples, as shown in Table A below. The difference on intentions in the Latvian sample was approaching statistical significance. To double check the result, the t-test was used. Levene's test indicated that the assumption of homogeneity of variances was not met in case of intentions and prior proclivity in the Latvian sample. This meant that the samples of respondents and non-respondents were drawn from populations that did not have the same variance of intentions and prior proclivity. Therefore, the standard t-test might not be valid (Howell 2010). When equal variances are not assumed, Welch's test built into the independent samples t-test showed significant differences in none of the tested variables.

Based on the data from 120 incomplete observations, 85% of the non-respondents from Estonia did study entrepreneurship compulsorily, for 8% it was an elective subject, 6% did not study it (and 1% marked "other"). Among 50 Latvian non-respondents, 68% had entrepreneurship as a compulsory discipline, 12% as an elective, 16% did not study it (and 4% marked "other"). These figures do not differ considerably from the profile of respondents.

Table A Comparison of respondents and non-respondents

Variable/country	Estonia	Latvia
Nascency	• $\chi^2=0.027$, $df=1$, $p<0.870$	• $\chi^2=0.040$, $df=1$, $p<0.842$
Intentions	• $\chi^2=0.438$, $df=1$, $p<0.508$	• $\chi^2=2.702$, $df=1$, $p<0.100$
Prior proclivity	• $\chi^2=0.543$, $df=1$, $p<0.461$	• $\chi^2=2.117$, $df=1$, $p<0.146$
Prior knowledge	• $\chi^2=0.933$, $df=1$, $p<0.334$	• $\chi^2=0.125$, $df=1$, $p<0.723$

The sample composition in both countries allows drawing a comparison between two forms of study, namely, compulsory and elective. There are 23 Estonian and 22 Latvian students, who indicated they studied the discipline as an elective subject. They were evenly distributed among the HEIs in both countries. In the Latvian sample, a separate comparative test was run between 306 entrepreneurship and 35 non-entrepreneurship graduates. In the Estonian sample, entrepreneurship graduates with business (N=211) and engineering (N=29) background were compared. These tests were logical to run on the self-reported prior competences of the respondents in order to address the potential problem of self-selection according to EE. On top of prior entrepreneurial career aspirations and knowledge, prior experience in entrepreneurship served as the third testable independent variable. Again, in view of the small samples and dissimilar sample sizes in the groups, the non-parametric Kruskal-Wallis was used (ibid 2010).

The test showed no significant differences in the reported levels of prior proclivity to become an entrepreneur, of knowledge and experience in entrepreneurship between the compulsory and elective groups. The only exception was registered in the Latvian sample in relation to prior aspirations. The difference was approaching the 5% significance. Please see Table B for details. The t-test confirmed the result $\{t=-1.813$, $df=304$, $p<0.071\}$.

Given that entrepreneurship was compulsory to over 80% of the Estonian and Latvian graduates, and prior competences are planned to be controlled for in testing the hypotheses, selection according to EE does not seem to be a problem. Absence of statistically significant differences in prior entrepreneurial knowledge ($\chi^2=1.900$, $df=1$, $p<0.168$) and experience ($\chi^2=0.474$, $df=1$, $p<0.491$) between entrepreneurship and non-entrepreneurship (but business-related) graduates may serve as an additional confirmation of this in the Latvian sample. The

difference in prior entrepreneurial aspirations was approaching the 5% significance level ($\chi^2=3.472$, $df=1$, $p<0.062$). Finally, no differences were registered in prior aspirations ($\chi^2=2.135$, $df=1$, $p<0.144$), knowledge ($\chi^2=1.684$, $df=1$, $p<0.194$) or experience ($\chi^2=1.552$, $df=1$, $p<0.213$) between the graduates with business and non-business backgrounds in the Estonian sample.

Table B Comparison of respondents in compulsory and elective forms of study

Variable/country	Estonia	Latvia
Prior proclivity	• $\chi^2=0.637$, $df=1$, $p<0.425$	• $\chi^2=3.230$, $df=1$, $p<0.072$
Prior knowledge	• $\chi^2=0.148$, $df=1$, $p<0.700$	• $\chi^2=0.095$, $df=1$, $p<0.758$
Prior experience	• $\chi^2=0.400$, $df=1$, $p<0.527$	• $\chi^2=0.057$, $df=1$, $p<0.811$

The learning and objective outcomes of the entrepreneurship and non-entrepreneurship graduates with business background in the Latvian sample as well as of the business and non-business graduates who studied entrepreneurship in the Estonian sample will also be compared to see whether findings of the previous studies, e.g. Rauch and Hulsink (2014), Souitaris et al. (2007), Charney and Libecap (2000) confirm in the post-transition context.

Descriptive information about the updated samples ($N=211$ and $N=306$) that hypothesis testing is based on is outlined in Table C.

Matching comparison groups

In line with the pursued study design, the research subjects were not randomly assigned to experiential and traditional EE or to the HEIs for that matter, but the purposive homogeneous sampling forestalled certain criteria for the subjects to enter the selection as discussed in Chapter 5 (section 5.3.1). As concluded from the descriptive data, the targeting was generally correct: the students had business education background, studied entrepreneurship compulsorily, were either final year bachelor students or recent graduates from these programmes, were taught by the interviewed educators. Therefore, the groups of subjects were not supposed to differ from each other substantially before being enrolled into the educational programmes. To ascertain that this was indeed the case and the groups of subjects could be compared with no extra adjustments, they had to be matched on a set of *baseline characteristics* that were present before the interventions: gender, age, having parents-entrepreneurs, prior entrepreneurial proclivity, knowledge and experience. The comparative tests where the original grouping was kept also addressed the issue of selection according to HEIs. In the Latvian sample, grouping by the form of intervention involved combining observations from the experiential HEIs G and F that were compared with the combined HEIs E and H. In the Estonian sample, HEI C was compared with the traditional others. The related tests also addressed the issue of potential selection according to the form of intervention.

The original grouping of the respondents by HEIs implied pair-wise comparisons between four schools in each country, for which one-way analysis of variance (ANOVA) was chosen as the most suitable method. Unlike Kruskal-Wallis test that is powerful in its convenience since it is quite robust to violations of a number of assumptions, including normality and homogeneity of variances, ANOVA is more sensitive to violations as well as to small or uneven samples. Yet, it is exceptionally useful in providing with follow-up tests that reveal where identified differences between groups are coming from.

Table C Samples of entrepreneurship graduates

HEI and bachelor completion, institution share crosstab		Did you complete your bachelor's degree?		Total	HEI share in the sample
		Yes	No		
A	N	39	34	73	34.6%
	%	53.4%	46.6%	100.0%	
B	N	12	13	25	11.8%
	%	48.0%	52.0%	100.0%	
C	N	18	19	37	17.5%
	%	48.6%	51.4%	100.0%	
D	N	45	31	76	36.0%
	%	59.2%	40.8%	100.0%	
Total in Estonia	N	114	97	211	100.0%
	%	54.0%	46.0%	100.0%	
E	N	46	14	60	19.6%
	%	76.7%	23.3%	100.0%	
F	N	70	53	123	40.2%
	%	56.9%	43.1%	100.0%	
G	N	72	15	87	28.4%
	%	82.8%	17.2%	100.0%	
H	N	6	30	36	11.8%
	%	16.7%	83.3%	100.0%	
Total in Latvia	N	194	112	306	100.0%
	%	63.4%	36.6%	100.0%	

Inspection of the data distribution using Shapiro-Wilk's and Kolmogorov-Smirnov's tests for normality showed that observations (as well as residuals) in every HEI were non-normally distributed in both countries. This pattern was also visible in the SPSS-generated histograms of the dependent variable distribution (prior knowledge, proclivity, age, etc.) in each group of the independent variable (HEI) the most common type of violation being positive or negative skewness. Judging by box-plots, prior entrepreneurial experience and age had several outliers, few of them extreme, in both samples. Furthermore, demographic variables (age, gender, and parent-entrepreneur) in the Estonian sample did not pass Levene's test, while only one variable (prior knowledge) did pass this homogeneity of variances test in the Latvian sample. Therefore, a modified version of the method, Welch's ANOVA, had to be applied to these variables, alongside with a Games-Howell post-hoc test.

For other variables, standard one-way ANOVA and a Bonferroni post-hoc test were applicable. More stringent than Fisher's Least Significant Difference (LSD), Bonferroni counteracts the problem of multiple comparisons (as well as is robust to the violations of homoscedasticity, i.e. equal variation of residuals for all values), albeit is more conservative than Tukey's procedure. The latter is specifically applicable for pair-wise comparisons (and assumes the homogeneity of

variances), but was less preferable to Bonferroni in order to maintain consistency with the analysis of co-variance tests used further in hypothesis testing. To back up the findings in view of the outliers and uneven group sizes that make ANOVA less robust to the violations of normality, non-parametric Kruskal-Wallis test was run on top.

The findings suggest that the Estonian HEIs are better comparable with each other and call for adjustments or controls for two variables that are prior entrepreneurial proclivity ($F(3,207)=2.826$, $p<0.040$) and age (Welch's $F(3,86.847)=14.821$, $p<0.000$). According to the Bonferroni post-hoc, only if the significance level is set to 10%, one could state that experiential HEI C attracts more applicants who have higher proclivity towards entrepreneurship than other schools. Confirming what was depicted from the sample descriptives, age is an issue, particularly in HEI D where students are significantly older than in HEIs B and even A. Kruskal-Wallis just reiterated the similar results: for proclivity ($\chi^2=8.203$, $df=3$, $p<0.042$) and for age ($\chi^2=17.149$, $df=3$, $p<0.001$).

The situation in the Latvian sample is a bit more complicated with salient differences between the HEIs across four dependent variables as confirmed by both Welch's ANOVA and Kruskal-Wallis tests. See Table D.

Table D Initial differences between HEIs in the Latvian sample

Dependent var.:	ANOVA	Kruskal-Wallis
prior experience	Welch's $F(3,125.189)=2.901$, $p<0.038$	$\chi^2=6.782$, $df=3$, $p<0.079$
prior proclivity	Welch's $F(3,115.761)=7.765$, $p<0.000$	$\chi^2=20.657$, $df=3$, $p<0.000$
age	Welch's $F(3,108.259)=8.549$, $p<0.000$	$\chi^2=15.752$, $df=3$, $p<0.001$
gender	Welch's $F(3,119.723)=3.488$, $p<0.018$	$\chi^2=10.426$, $df=3$, $p<0.015$

Games-Howell post-hoc test clarifies that the predominantly experiential HEI F attracts applicants with significantly higher initial entrepreneurial aspirations than the most experiential in the sample HEI G – the pattern reflected also in the interview data. Applicants from HEI F tend to be more experienced than those from HEI E (the difference registered on a 10% level as in the Kruskal-Wallis test result). In addition, applicants from HEI G are younger than applicants from HEIs E and F. Finally, HEI G has much less female students than HEI E (on a 5% level), and, to an extent, than HEI F and H (10% level).

Grouping by the type of EE intervention and using the Kruskal-Wallis test returns significant differences in terms of prior entrepreneurial experience, gender and age in the Latvian sample, and reiterates the difference in prior proclivity in the Estonian sample, where the guess is far from being wild – respondents from the experiential HEI C have higher initial entrepreneurial aspirations. To identify the source of difference in the Kruskal-Wallis test is a more complex procedure (requiring the inspection of medians or distribution shapes) that would be in excess for this analysis. However, backed up by the earlier ANOVA post-hoc tests of HEIs, it is likely that students who underwent experiential EE in Latvia had higher initial entrepreneurial experience and tended to be younger males.

The matching results firstly suggest that whilst there seem to be no self-selection problem according to EE and the uniformity in the selection criteria has been met, some differences between the HEIs in terms of age, gender, prior entrepreneurial experience and proclivity (but not in prior knowledge) still apply. Secondly, albeit the applicants' admission to the HEIs was not directly related to the purposeful selection into the form of intervention, HEI C tends to attract individuals with higher initial entrepreneurial aspirations (though it was the only experiential school in the

Estonian sample). This, however, does not hold for the Latvian sample, where the aspirations were much lower in the experiential HEI G than in predominantly experiential HEI F.

The identification of the aforementioned differences by no means implies that the observations by HEIs are not comparable. Classical or quasi-experiment could also easily yield groups of subjects with differing characteristics. The preparatory findings rather increase the researcher's awareness of the control variables that have to be paid closer attention to throughout the main analysis.

Annex 9 Construction of the affective outcomes' composite indicator – Estonian dataset example

	Squared loadings					
	1	2	3	4	5	6
I want to start a (one more) new enterprise.	0.595	0.032	0.011	0.018	0.000	0.020
Among various options, I would rather be an entrepreneur.	0.722	0.011	0.011	0.009	0.004	0.004
To be an entrepreneur and have own company is my true passion.	0.696	0.051	0.004	0.004	0.017	0.035
A career as an entrepreneur suits me well – it gives more freedom and autonomy.	0.743	0.015	0.041	0.013	0.009	0.000
I am confident in my ability to start a new enterprise.	0.451	0.043	0.016	0.143	0.014	0.004
My professional goal is to be an entrepreneur.	0.724	0.056	0.007	0.000	0.001	0.023
I will make every effort to start a new enterprise, when aspired.	0.650	0.042	0.007	0.000	0.003	0.052
I always try to find innovative solutions to arising or existing challenges.	0.036	0.449	0.016	0.027	0.006	0.001
I can rely on myself in any demanding situation.	0.038	0.094	0.057	0.575	0.028	0.001
I like taking business risks – it excites me!	0.089	0.017	0.005	0.030	0.001	0.665
I tend to take my chances, even if I might fail.	0.050	0.052	0.020	0.000	0.000	0.693
I can rely on myself in any uncertain situation.	0.005	0.039	0.008	0.714	0.019	0.026
Usually I set ambitious goals to myself.	0.037	0.153	0.470	0.005	0.004	0.020
I want to achieve more than most other people.	0.065	0.059	0.658	0.022	0.000	0.010
It is vital for me to grow and develop constantly.	0.012	0.011	0.446	0.038	0.196	0.004
I openly question how things can be improved.	0.010	0.447	0.000	0.033	0.002	0.046
I perceive myself as a creative person.	0.019	0.447	0.051	0.009	0.012	0.021
I am keen on new learning.	0.001	0.011	0.037	0.051	0.667	0.019
I appreciate professional guidance from more experienced people.	0.012	0.029	0.000	0.001	0.637	0.013
I am enthusiastic about generating new ideas and recognising new opportunities.	0.087	0.465	0.014	0.007	0.047	0.025
I am always trying to be alert to new ideas and opportunities that come to my mind.	0.040	0.465	0.064	0.007	0.118	0.003
I always make my best effort to convince other people in my ideas.	0.032	0.471	0.009	0.001	0.021	0.002
I feel self-confident when talk to successful entrepreneurs.	0.035	0.320	0.034	0.138	0.001	0.095
<i>Explained variance</i>	<i>5.150</i>	<i>3.779</i>	<i>1.989</i>	<i>1.847</i>	<i>1.808</i>	<i>1.781</i>
<i>Explained/total</i>	<i>0.315</i>	<i>0.231</i>	<i>0.122</i>	<i>0.113</i>	<i>0.111</i>	<i>0.109</i>
Cronbach's alpha	0.937	0.857	0.766	0.780	0.663	0.791

Weights of intermediate composites					
1	2	3	4	5	6
0.116	0.119	0.236	0.311	0.369	0.373
0.140	0.118	0.331	0.387	0.352	0.389
0.135	0.118	0.224			
0.144	0.123				
0.088	0.123				
0.141	0.125				
0.126	0.085				

$$\begin{aligned} \text{AffectiveSubCompt1} &= \text{ZQ54_2} * 0.116 + \text{ZQ54_4} * 0.140 + \text{ZQ54_6} * 0.135 + \text{ZQ54_7} * 0.144 + \text{ZQ54_8} * 0.088 + \text{ZQ54_34} * 0.141 + \text{ZQ54_49} * 0.126 \\ \text{AffectiveSubCompt2} &= \text{ZQ54_1} * 0.119 + \text{ZQ54_23} * 0.118 + \text{ZQ54_24} * 0.118 + \text{ZQ54_31} * 0.123 + \text{ZQ54_32} * 0.123 + \text{ZQ54_33} * 0.125 + \text{ZQ54_39} * 0.085 \\ \text{AffectiveSubCompt3} &= \text{ZQ54_19} * 0.236 + \text{ZQ54_20} * 0.331 + \text{ZQ54_21} * 0.224 \\ \text{AffectiveSubCompt4} &= \text{ZQ54_9} * 0.311 + \text{ZQ54_15} * 0.387 \\ \text{AffectiveSubCompt5} &= \text{ZQ54_29} * 0.369 + \text{ZQ54_30} * 0.352 \\ \text{AffectiveSubCompt6} &= \text{ZQ54_13} * 0.373 + \text{ZQ54_14} * 0.389 \end{aligned}$$

$$\begin{aligned} \text{Composite} &= \text{AffectiveSubCompt1} * 0.315 + \text{AffectiveSubCompt2} * 0.231 + \text{AffectiveSubCompt3} * 0.122 + \text{AffectiveSubCompt4} * 0.113 + \\ &+ \text{AffectiveSubCompt5} * 0.111 + \text{AffectiveSubCompt6} * 0.109 \end{aligned}$$

Annex 10 Testing the first hypothesis

a) Correlations between the composites of the learning outcomes

<i>Estonian sample</i>		Knowledge	Skills	Affective outcomes
Cognitive outcomes/ Knowledge	Pearson Correlation	1	0.513**	0.390**
	Sig. (2-tailed)		0.000	0.000
	N	211	211	211
Skill-based outcomes/ Skills	Pearson Correlation	0.513**	1	0.422**
	Sig. (2-tailed)	0.000		0.000
	N	211	211	211
Affective outcomes	Pearson Correlation	0.390**	0.422**	1
	Sig. (2-tailed)	0.000	0.000	
	N	211	211	211

** . Correlation is significant at the 0.01 level (2-tailed).

<i>Latvian sample</i>		Knowledge	Skills	Affective outcomes
Cognitive outcomes/ Knowledge	Pearson Correlation	1	0.575**	0.124*
	Sig. (2-tailed)		0.000	0.030
	N	306	306	306
Skill-based outcomes/ Skills	Pearson Correlation	0.575**	1	0.224**
	Sig. (2-tailed)	0.000		0.000
	N	306	306	306
Affective outcomes	Pearson Correlation	0.124*	0.224**	1
	Sig. (2-tailed)	0.030	0.000	
	N	306	306	306

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

b) Correlations between knowledge, skills and the six subscales of the affective outcomes

<i>Estonian sample</i>		Knowledge	Skills	Affection	Creativity/ confidence	Need for achievement	Self-reliance	New learning	Risk/failure
Knowledge	Pearson Correlation Sig. (2-tailed) N	1 211							
Skills	Pearson Correlation Sig. (2-tailed) N	0.513** 0.000 211	1 211						
Affection	Pearson Correlation Sig. (2-tailed) N	0.340** 0.000 211	0.377** 0.000 211	1 211					
Creativity/ confidence	Pearson Correlation Sig. (2-tailed) N	0.313** 0.000 211	0.336** 0.000 211	0.511** 0.000 211	1 211				
Need for achievement	Pearson Correlation Sig. (2-tailed) N	0.331** 0.000 211	0.344** 0.000 211	0.443** 0.000 211	0.575** 0.000 211	1 211			
Self-reliance	Pearson Correlation Sig. (2-tailed) N	0.158* 0.022 211	0.193** 0.005 211	0.333** 0.000 211	0.518** 0.000 211	0.465** 0.000 211	1 211		
New learning	Pearson Correlation Sig. (2-tailed) N	0.120* 0.082 211	0.175* 0.011 211	0.208** 0.002 211	0.339** 0.000 211	0.360** 0.000 211	0.362** 0.000 211	1 211	
Risk/failure	Pearson Correlation Sig. (2-tailed) N	0.289** 0.000 211	0.235** 0.001 211	0.464** 0.000 211	0.427** 0.000 211	0.354** 0.000 211	0.275** 0.000 211	0.086 0.211 211	1 211

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

+ . Correlation is significant at the 0.10 level (2-tailed).

<i>Latvian sample</i>		Knowledge	Skills	Affection	Creativity/ confidence	Need for achievement	New learning	Self-reliance	Risk/failure
Knowledge	Pearson Correlation Sig. (2-tailed) N	1 306							
Skills	Pearson Correlation Sig. (2-tailed) N	0.575** 0.000 306	1 306						
Affection	Pearson Correlation Sig. (2-tailed) N	0.079 0.167 306	0.134* 0.019 306	1 306					
Creativity/ confidence	Pearson Correlation Sig. (2-tailed) N	0.093 0.104 306	0.267** 0.000 306	0.350** 0.000 306	1 306				
Need for achievement	Pearson Correlation Sig. (2-tailed) N	0.046 0.426 306	0.089 0.121 306	0.291** 0.000 306	0.464** 0.000 306	1 306			
New learning	Pearson Correlation Sig. (2-tailed) N	0.041 0.477 306	0.059 0.303 306	0.100 0.081 306	0.371** 0.000 306	0.381** 0.000 306	1 306		
Self-reliance	Pearson Correlation Sig. (2-tailed) N	0.094 0.101 306	0.138** 0.016 306	0.167** 0.003 306	0.347** 0.000 306	0.401** 0.000 306	0.263** 0.000 306	1 306	
Risk/failure	Pearson Correlation Sig. (2-tailed) N	0.187** 0.001 306	0.232** 0.000 306	0.368** 0.000 306	0.460** 0.000 306	0.315** 0.000 306	0.134* 0.019 306	0.306** 0.000 306	1 306

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Annex 11 Testing the second hypothesis in AMOS

<i>Hypothesis</i>	<i>Link</i>	<i>Estimate</i>	<i>S.E.</i>	<i> t value</i>	<i>Two-tailed p</i>	<i>Standardised regr.weight</i>	<i>Variance explained</i>
H2 (EST)	1. C→S	0.419	0.063	6.605	0.000	0.562	31.6%
	2. S→A	0.438	0.122	3.587	0.000	0.315	20.4%
	3. C→A	0.199	0.089	2.236	0.025	0.192	
Fit indexes: $\chi^2=419.065$, $df=268$, $p<0.000$; CMIN/DF=1.564, GFI= 0.865, NFI=0.895, CFI=0.959, RMSEA=0.052							
H2 (LV)	1. C→S	0.622	0.070	8.936	0.000	0.633	40.0%
	2. S→A	0.171	0.082	2.073	0.038	0.174	2.5%
	3. C→A	-0.026	0.083	-0.312	0.755	-0.027	
Fit indexes: $\chi^2=436.237$, $df=244$, $p<0.000$; CMIN/DF=1.788, GFI=0.889, NFI=0.911, CFI=0.958, RMSEA=0.051							

Annex 12 Checking the assumptions for the comparison of learning outcomes

Before running the analysis of variance tests, it was necessary to check which of the following assumptions the data met:

1) for ANOVA –

- no significant outliers in the groups.
- the dependent variables approximately normally distributed for each group of the independent variable (the same as the distribution of the residuals in this test).
- homogeneity of variance (the variance was equal in each group).

2) for ANCOVA –

- normal distribution and no outliers (similar to ANOVA).
- homogeneity of variance of the residuals for the independent variable groups (similar to ANOVA).
- homogeneity of regression slopes.
- homoscedasticity.

Otherwise, the dependent variables were continuous, the grouping variables were categorical with four and two independent groups, and there was the independence of observations.

Annex 12 (cont.)

ANOVA

		Result	
Assumption	Meaning	<i>Estonian sample</i>	<i>Latvian sample</i>
No significant outliers in the groups	Extremely small or large values influence the mean and standard deviation for the group where they are detected.	Dependent variable Cognitive outcomes Skill-based outcomes Affective outcomes	As assessed by inspection of a boxplot, four outliers (one per HEI) were detected only in the affective outcomes. Two outliers in HEI E, one in HEI F, five in HEI G; none of them extreme.
Normal distribution	The dependent variable is approximately normally distributed for each group of the independent variable.	Cognitive outcomes Skill-based outcomes Affective outcomes	The variable was non-normally distributed in HEI H (negative kurtosis as assessed by the histogram). In HEIs E, F, G, the Shapiro-Wilk's test suggests the violations of normality (negative skewness in HEI E, negative kurtosis in HEI F, positive kurtosis in HEI G) HEI F does not meet the assumption (negative kurtosis).
Homogeneity of variance	The population variance for each group of the independent variable is the same.	Learning outcomes: knowledge, skills, attitudes	There was homogeneity of variances, as assessed by Levene's test for equality of variances ($p>0.5/p>0.2$).

Annex 12 (cont.)

ANCOVA (full factorial model, "final") – grouping by HEIs

Assumption	Meaning	Dependent variable	Result	
			<i>Estonian sample</i>	<i>Latvian sample</i>
Homogeneity of regression slopes	There is no interaction between the independent variable (HEI/group) and the covariates (the regression lines are parallel).	Learning outcomes: knowledge, skills, attitudes	There was homogeneity of regression slopes as the interaction terms were not statistically significant, except for HEI*graduate in cognitive outcomes ($p < 0.5$).	The assumption was met.
Normal distribution	Normality of the group residuals and of the overall model residuals.	Learning outcomes: knowledge, skills, attitudes	Standardised residuals for the HEIs and for the overall model were normally distributed as assessed by Shapiro-Wilk's test ($p > 0.05$), except for affective outcomes in HEI A (positive kurtosis) that also influenced the overall model.	The assumption was met for the group residuals, except for skill-based outcomes in HEIs E and F (negative skewness). This is also reflected in the overall model; the stand.residuals of the affective outcomes were also non-normally distributed ($p < 0.05$).
Homoscedasticity	The variance of the residuals is equal for all predicted values.	Learning outcomes: knowledge, skills, attitudes	Scatterplots of the standardised residuals against predicted values showed the assumption was met.	
Homogeneity of variance of the residuals	The variance of the residuals is equal for the different groups of the independent variable.	Learning outcomes: knowledge, skills, attitudes	There was homogeneity of error variances as assessed by Levene's test ($p > 0.5$; $p > 0.2$).	

ANCOVA (full factorial model, "final") – grouping by the form of intervention

		Result	
Assumption	<i>Estonian sample</i>	<i>Latvian sample</i>	
No significant outliers in the groups	Several outliers including one extreme were found in affective outcomes of the traditional group, as well as two outliers in the experiential group. The assumption was met.	Few but no extreme outliers were detected in skill-based outcomes (both groups), and in cognitive outcomes (experiential group).	
Homogeneity of regression slopes	The assumption was met.		
Normal distribution of the group residuals	The assumption was not met in the traditional intervention group in the cases of attitudes ($p < 0.01$, positive kurtosis) and knowledge ($p < 0.05$, negative kurtosis).	The assumption was not met in both groups in the case of the skill-based outcomes: -traditional type ($p < 0.01$, negative skewness); -experiential type ($p < 0.01$, positive kurtosis).	
Homoscedasticity	The assumption was not met in the case of the skill-based outcomes (the scatterplot showed the signs of heteroscedasticity).	Scatterplots of the standardised residuals against predicted values showed the assumption was met.	
Homogeneity of variance of the residuals	There was homogeneity of error variances as assessed by Levene's test ($p > 0.2$).		

Annex 13 Descriptive statistics for the components of the affective outcome composite by HEI*

<i>Estonian sample</i> HEIs, N=211		Affective outcomes comp.	Affection	Creative attitude	Need for achievement	Sense of self- reliance	Attitude to new learning	Attitude to risk and failure
A	Mean	-0.002	-0.004	-0.084	0.037	0.069	0.101	-0.036
	SD	0.911	1.001	1.059	0.964	0.887	0.946	1.025
B	Mean	-0.019	-0.195	0.110	0.254	0.054	-0.158	0.729
	SD	0.875	0.848	0.952	0.872	1.032	0.950	1.038
C	Mean	0.528	0.476	0.414	0.535	0.278	0.232	0.118
	SD	0.921	0.889	0.871	0.946	0.860	0.916	0.953
D	Mean	-0.249	-0.164	-0.157	-0.380	-0.219	-0.157	-0.065
	SD	1.073	1.037	0.974	0.961	1.121	1.086	0.997

<i>Latvian sample</i> HEIs, N=306		Affective outcomes comp.	Affection	Creative attitude	Need for achievement	Attitude to new learning	Sense of self- reliance	Attitude to risk and failure
E	Mean	-0.085	-0.077	-0.073	-0.210	-0.112	0.113	0.051
	SD	0.975	1.062	1.011	1.006	0.928	0.914	0.948
F	Mean	0.194	0.219	0.163	0.081	0.015	0.081	0.031
	SD	0.996	0.926	1.043	0.924	1.066	1.043	0.966
G	Mean	-0.161	-0.239	-0.209	0.087	0.118	-0.102	-0.020
	SD	1.006	1.070	0.973	1.064	0.931	0.979	1.118
H	Mean	-0.131	-0.042	0.067	-0.136	-0.152	-0.219	-0.144
	SD	0.969	0.829	0.808	1.055	1.044	1.019	0.918

*Notes:

-SD – standard deviation

-highest mean values are marked with italics.

Annex 14a Results of the between-subjects analysis of (co-)variance in the Estonian HEIs

Dependent variable (Z-stand.)	School	N	Unadjusted		Adjusted I		Adjusted II		Adjusted III		
			M	SE	M	SE	M	SE	M	SE	CI
Knowledge	A	73	-0.134	0.112	-0.137	0.118	-0.146	0.119	-0.123	0.119	[-0.357, 0.112]
I. R ² =0.024	B	25	0.027	0.189	-0.009	0.205	-0.005	0.205	-0.040	0.205	[-0.445, 0.364]
II. R ² =0.026	C	37	0.161	0.173	0.154	0.165	0.157	0.166	0.122	0.166	[-0.205, 0.450]
III. R ² =0.065	D	76	0.041	0.119	0.059	0.119	0.065	0.119	0.071	0.119	[-0.163, 0.306]
Skills	A	73	-0.137	0.113	-0.130	0.117	-0.128	0.118	-0.122	0.119	[-0.356, 0.112]
I. R ² =0.038	B	25	-0.190	0.196	-0.161	0.203	-0.162	0.204	-0.177	0.206	[-0.582, 0.229]
II. R ² =0.039	C	37	0.371 ⁺	0.181	0.382 ⁺	0.164	0.385 ⁺	0.165	0.372 ⁺	0.167	[0.043, 0.701]
III. R ² =0.072	D	76	0.014	0.110	-0.008	0.118	-0.011	0.118	-0.006	0.119	[-0.240, 0.228]
Affection	A	73	-0.004	0.117	-0.030	0.112	0.025	0.089	0.019	0.090	[-0.159, 0.198]
I. R ² =0.116	B	25	-0.195	0.170	-0.266	0.195	-0.095	0.156	-0.086	0.157	[-0.396, 0.224]
II. R ² =0.441	C	37	0.476 [*]	0.146	0.433 [*]	0.157	0.207	0.127	0.215	0.129	[-0.039, 0.468]
III. R ² =0.442	D	76	-0.164	0.119	-0.094	0.113	-0.094	0.090	-0.095	0.090	[-0.273, 0.084]
Affective comp.	A	73	-0.002	0.107	-0.008	0.056	0.015	0.048	0.006	0.048	[-0.089, 0.101]
I. R ² =0.104	B	25	-0.019	0.175	-0.026	0.096	0.046	0.083	0.058	0.084	[-0.108, 0.223]
II. R ² =0.338	C	37	0.528 [*]	0.151	0.246 [*]	0.078	0.152 [*]	0.068	0.162 [*]	0.068	[-0.027, 0.297]
III. R ² =0.346	D	76	-0.249	0.123	-0.103	0.056	-0.103	0.048	-0.104	0.048	[-0.199, -0.009]

Notes:

Unadjusted – Mean values of the learning outcomes (knowledge, skills, affection) not adjusted by any covariates.

Adjusted I – Covariates of the learning outcomes are: age, parent-entrepreneur, gender (female).

Adjusted II – Covariate of knowledge is prior knowledge about entrepreneurship, covariates of skills are prior experience in entrepreneurship and prior work experience, covariate of affection is prior entrepreneurship career aspirations. Controls are: age, parent-entrepreneur, gender (female).

Adjusted III – Covariates are prior competences (knowledge, experience, aspirations). Controls are: having a parent-entrepreneur, gender (female), age, attitudes to educators, graduate status.

N – number of respondents, M – mean, SE – standard error, CI – confidence interval.

*p<0.05, +p<0.10 (the Bonferroni adjustment for multiple comparisons, the Sidák adjustment to double check the result)

Annex 14b Results of the between-subjects analysis of (co-)variance in the Latvian HEIs

Dependent variable (Z-stand.)	School	N	Unadjusted		Adjusted I		Adjusted II		Adjusted III		
			M	SE	M	SE	M	SE	M	SE	CI
Knowledge I. R ² =0.015	E	60	0.120	0.126	0.150	0.132	0.116	0.131	0.055	0.126	[-0.192, 0.303]
	F	123	0.004	0.097	0.002	0.090	-0.001	0.090	0.045	0.086	[-0.125, 0.215]
	G	87	0.007	0.095	0.006	0.111	0.016	0.111	-0.121	0.110	[-0.337, 0.094]
III. R ² =0.120	H	36	-0.230	0.169	-0.248	0.167	-0.272	0.168	0.002	0.171	[-0.334, 0.339]
	E	60	-0.015	0.123	-0.010	0.131	-0.036	0.132	-0.070	0.128	[-0.323, 0.182]
	F	123	0.134	0.095	0.131	0.090	0.136	0.090	0.164	0.087	[-0.008, 0.335]
II. R ² =0.028	G	87	-0.142	0.105	-0.091	0.111	-0.088	0.110	-0.178	0.111	[0.396, 0.040]
	H	36	-0.093	0.153	-0.117	0.166	-0.122	0.166	0.053	0.172	[-0.286, 0.391]
	E	60	-0.077	0.137	-0.046	0.127	-0.046	0.106	-0.056	0.107	[-0.266, 0.154]
I. R ² =0.078	F	123	0.219*	0.084	0.226*	0.088	0.064	0.074	0.071	0.075	[-0.075, 0.218]
	G	87	-0.239	0.115	-0.291	0.107	-0.048	0.091	-0.071	0.095	[-0.258, 0.115]
	H	36	-0.042	0.138	0.008	0.162	-0.025	0.135	0.022	0.145	[-0.263, 0.307]
Affective comp.	E	60	-0.085	0.126	-0.061	0.128	-0.031	0.063	-0.034	0.063	[-0.157, 0.090]
	F	123	0.194 ⁺	0.090	0.199*	0.088	0.041	0.044	0.044	0.044	[-0.042, 0.131]
	G	87	-0.161	0.108	-0.204	0.108	-0.007	0.054	-0.016	0.056	[-0.126, 0.093]
III. R ² =0.257	H	36	-0.131	0.162	-0.084	0.164	-0.058	0.080	-0.044	0.085	[-0.212, 0.124]

Notes:

Unadjusted – Mean values of the learning outcomes (knowledge, skills, affection) not adjusted by any covariates.

Adjusted I – Covariates of the learning outcomes are: age, parent-entrepreneur, gender (female).

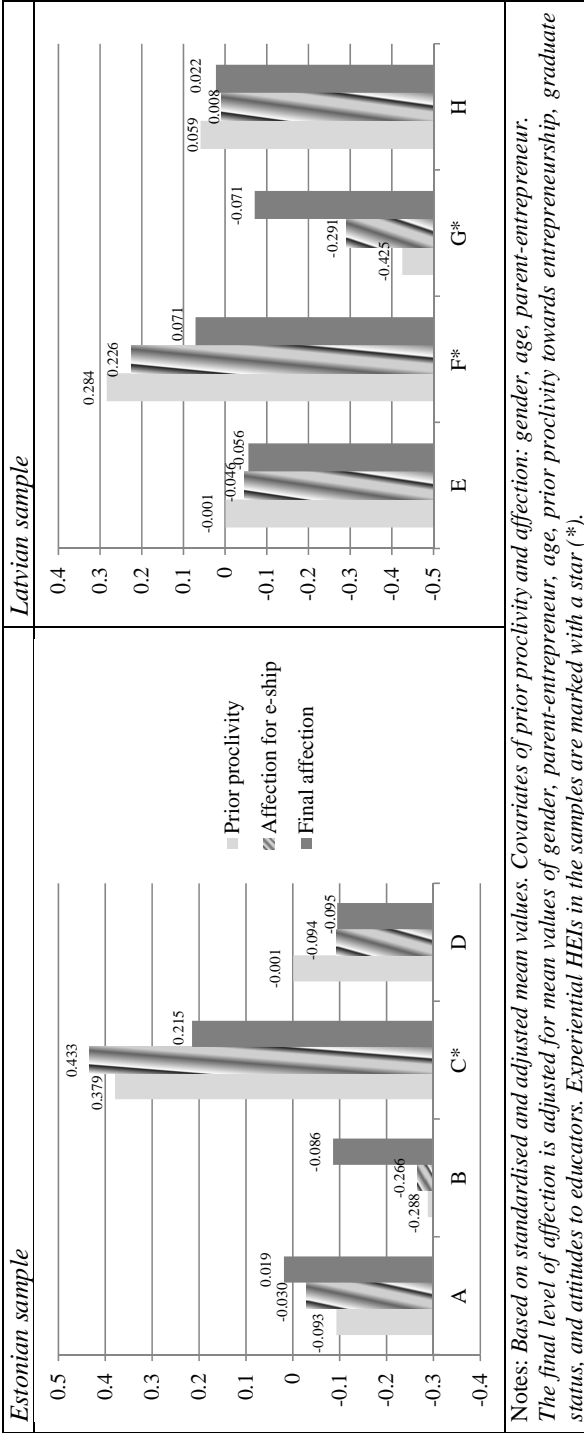
Adjusted II – Covariate of knowledge is prior knowledge about entrepreneurship, covariates of skills are prior experience in entrepreneurship and prior work experience, covariate of affection is prior entrepreneurship career aspirations. Controls are: age, parent-entrepreneur, gender (female).

Adjusted III – Covariates are prior competences (knowledge, experience, aspirations). Controls are: having a parent-entrepreneur, gender (female), age, attitudes to educators, graduate status.

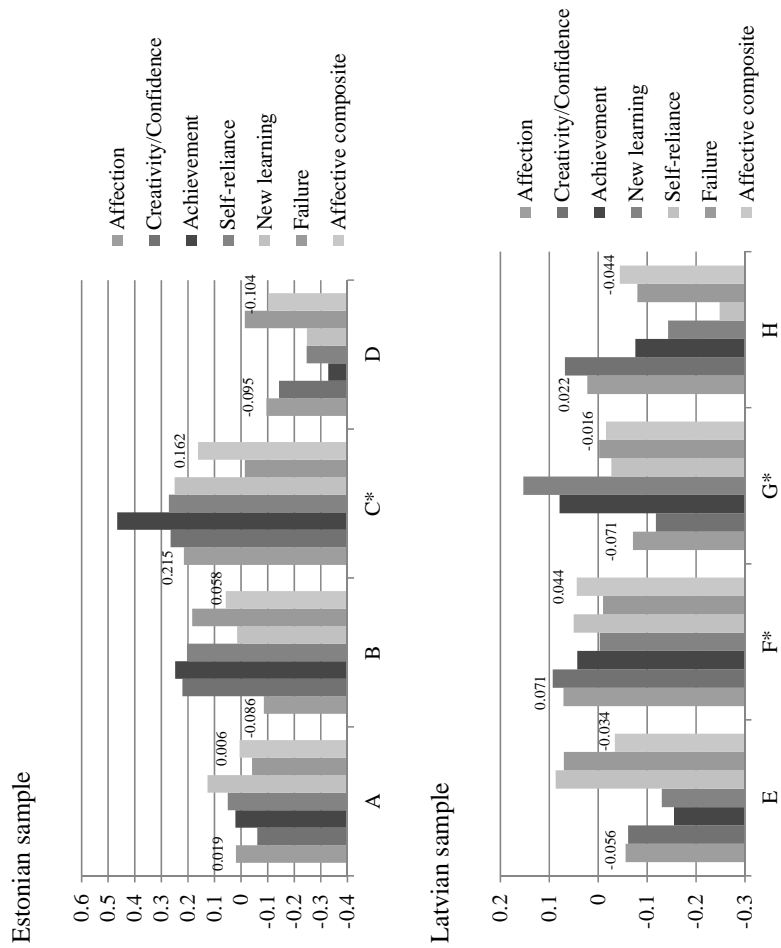
N – number of respondents, M – mean, SE – standard error, CI – confidence interval.

*p<0.05, +p<0.10 (the Bonferroni adjustment for multiple comparisons, the Sidák adjustment to double check the result)

Annex 15 The initial level of entrepreneurial career aspirations and the final level of affection



Annex 16 Mapping components of the affective outcomes and the composite (adjusted means, full factorial model)



Annex 17 Comparison of the learning outcomes by the level of prior aspirations – ANCOVA results

a) Cognitive outcomes

Descriptive statistics

	<i>Estonian sample</i>			<i>Latvian sample</i>		
	N (211)	Mean	SD	N (305)	Mean	SD
Prior proclivity						
0.00 (no)	60	-0.524	0.938	62	-0.231	0.987
1.00 (may be)	60	0.052	0.946	65	-0.046	1.084
2.00 (yes)	91	0.311	0.942	178	0.089	0.970

*Test results*Estonia: {F(2,202)=14.844, p<0.000, $\eta^2=0.128$ }Latvia: {F(2,296)=3.979, p<0.020, $\eta^2=0.026$ }*Estimated marginal means (adjusted)*

	<i>Estonian sample</i>			<i>Latvian sample</i>		
	Mean	SE	95% Confidence Interval Lower Bound Upper Bound	Mean	SE	95% Confidence Interval Lower Bound Upper Bound
Prior proclivity						
0.00 (no)	-0.546	0.123	-0.788 -0.303	-0.276	0.122	-0.516 -0.036
1.00 (may be)	0.052	0.122	-0.189 0.293	-0.076	0.117	-0.307 0.154
2.00 (yes)	0.326	0.100	0.128 0.523	0.116	0.071	-0.024 0.256

Pair-wise comparisons

Estonian sample

(I)	(J)	Mean Difference (I-J)	SE	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
0.00	1.00	-0.597*	0.173	0.002	-1.013	-0.181
	2.00	-0.871*	0.161	0.000	-1.259	-0.484
1.00	0.00	0.597*	0.173	0.002	0.181	1.013
	2.00	-0.274	0.160	0.241	-0.658	0.110
2.00	0.00	0.871*	0.161	0.000	0.484	1.259
	1.00	0.274	0.160	0.241	-0.110	0.658
Based on estimated marginal means						
*. The mean difference is significant at the 0.05 level.						
b. Adjustment for multiple comparisons: Sidak.						

Latvian sample

(I)	(J)	Mean Difference (I-J)	SE	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
0.00	1.00	-0.200	0.169	0.555	-0.605	0.205
	2.00	-0.392*	0.143	0.019	-0.736	-0.049
1.00	0.00	0.200	0.169	0.555	-0.205	0.605
	2.00	-0.192	0.138	0.413	-0.523	0.138
2.00	0.00	0.392*	0.143	0.019	0.049	0.736
	1.00	0.192	0.138	0.413	-0.138	0.523
Based on estimated marginal means						
*. The mean difference is significant at the 0.05 level.						
b. Adjustment for multiple comparisons: Sidak.						

b) Skill-based outcomes

Descriptive statistics

	<i>Estonian sample</i>		<i>Latvian sample</i>			
	N (211)	Mean	SD	N (305)	Mean	SD
Prior proclivity 0.00 (no)	60	-0.375	0.989	61	-0.251	0.986
1.00 (may be)	60	-0.010	0.997	65	-0.044	1.012
2.00 (yes)	91	0.254	0.939	179	0.116	0.973

Test results

Estonia: { $F(2,201)=8.718$, $p<0.000$, $\eta^2=0.080$ }

Latvia: { $F(2,295)=5.794$, $p<0.003$, $\eta^2=0.038$ }

Estimated marginal means (adjusted)

	<i>Estonian sample</i>			<i>Latvian sample</i>		
	Mean	SE	95% Confidence Interval Lower Bound Upper Bound	Mean	SE	95% Confidence Interval Lower Bound Upper Bound
Prior proclivity 0.00 (no)	-0.417	0.128	-0.670 -0.165	-0.318	0.123	-0.561 -0.076
1.00 (may be)	-0.018	0.129	-0.273 0.238	-0.087	0.118	-0.319 0.145
2.00 (yes)	0.287	0.106	0.078 0.495	0.154	0.071	0.014 0.295

Pair-wise comparisons

Estonian sample

(I)	(J)	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
0.00	1.00	-0.400	0.181	0.083	-0.836	0.037
	2.00	-0.704*	0.169	0.000	-1.110	-0.298
1.00	0.00	0.400	0.181	0.083	-0.037	0.836
	2.00	-0.304	0.171	0.213	-0.717	0.108
2.00	0.00	0.704*	0.169	0.000	0.298	1.110
	1.00	0.304	0.171	0.213	-0.108	0.717

Based on estimated marginal means

*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Sidak.

Latvian sample

(I)	(J)	Mean Difference (I-J)	SE	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
0.00	1.00	-0.231	0.170	0.440	-0.640	0.178
	2.00	-0.473*	0.144	0.003	-0.818	-0.127
1.00	0.00	0.231	0.170	0.440	-0.178	0.640
	2.00	-0.242	0.138	0.225	-0.574	0.090
2.00	0.00	0.473*	0.144	0.003	0.127	0.818
	1.00	0.242	0.138	0.225	-0.090	0.574

Based on estimated marginal means

*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Sidak.

c) Affective outcomes

Descriptive statistics

	<i>Estonian sample</i>			<i>Latvian sample</i>		
	N (211)	Mean	SD	N (306)	Mean	SD
Prior proclivity	60	-0.311	0.458	62	-0.297	0.414
0.00 (no)	60	-0.074	0.420	65	-0.136	0.411
1.00 (may be)	91	0.254	0.423	179	0.154	0.399
2.00 (yes)						

Test results

Estonia: { $F(2,202)=1.037$, $p<0.356$, $\eta^2=0.010$ }

Latvia: { $F(2,297)=2.691$, $p<0.069$, $\eta^2=0.018$ }

Estimated marginal means (adjusted)

	<i>Estonian sample</i>			<i>Latvian sample</i>		
	Mean	SE	95% Confidence Interval Lower Bound Upper Bound	Mean	SE	95% Confidence Interval Lower Bound Upper Bound
Prior proclivity	0.171	0.123	-0.072 0.414	0.226	0.107	0.015 0.437
0.00 (no)	0.004	0.057	-0.108 0.116	0.028	0.056	-0.082 0.139
1.00 (may be)	-0.115	0.096	-0.304 0.073	-0.087	0.052	-0.190 0.017
2.00 (yes)						

Pair-wise comparisons

Estonian sample

(I)	(J)	Mean Difference (I-J)	SE	Sig. ^a	95% Confidence Interval for Difference ^a	
					Lower Bound	Upper Bound
0.00	1.00	0.167	0.120	0.420	-0.123	0.457
	2.00	0.286	0.208	0.429	-0.214	0.787
1.00	0.00	-0.167	0.120	0.420	-0.457	0.123
	2.00	0.119	0.124	0.711	-0.180	0.418
2.00	0.00	-0.286	0.208	0.429	-0.787	0.214
	1.00	-0.119	0.124	0.711	-0.418	0.180
Based on estimated marginal means						
a. Adjustment for multiple comparisons: Sidak.						

Latvian sample

(I)	(J)	Mean Difference (I-J)	SE	Sig. ^a	95% Confidence Interval for Difference ^a	
					Lower Bound	Upper Bound
0.00	1.00	0.197	0.094	0.108	-0.029	0.424
	2.00	0.312	0.150	0.112	-0.049	0.673
1.00	0.00	-0.197	0.094	0.108	-0.424	0.029
	2.00	0.115	0.092	0.516	-0.107	0.337
2.00	0.00	-0.312	0.150	0.112	-0.673	0.049
	1.00	-0.115	0.092	0.516	-0.337	0.107
Based on estimated marginal means						
a. Adjustment for multiple comparisons: Sidak.						

Annex 18a Unadjusted mean values of the perceived learning outcomes in the groups of entrepreneurship and non-entrepreneurship graduates (Latvian sample)

Variables	E-ship and not	N	Mean	SD
Knowledge	0.00	35	-0.627	1.083
	1.00	306	0.072	0.966
Skills	0.00	35	-0.325	0.912
	1.00	306	0.037	1.004
Affection	0.00	35	-0.336	0.869
	1.00	306	0.038	1.008
Creative attitude and self-confidence	0.00	35	-0.076	0.982
	1.00	306	0.009	1.003
Need for achievement	0.00	35	-0.257	1.196
	1.00	306	0.029	0.973
Attitude to new learning	0.00	35	-0.049	0.956
	1.00	306	0.006	1.006
Sense of self-reliance	0.00	35	0.088	0.906
	1.00	306	-0.010	1.011
Attitude to risk and failure	0.00	35	0.029	0.874
	1.00	306	-0.003	1.015

* Notes: 0.00 – non-entrepreneurship graduates, 1.00 – entrepreneurship graduates

Annex 18b Unadjusted mean values of the perceived learning outcomes in the groups of business and non-business background entrepreneurship graduates (Estonian sample)

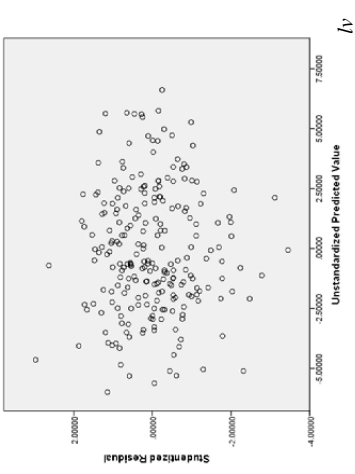
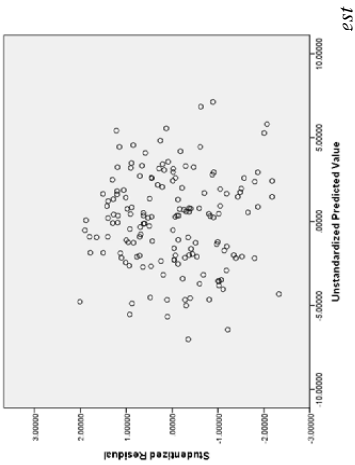
Variables	Business and not	N	Mean	SD
Knowledge	0.00	29	-0.592	0.828
	1.00	211	0.096	0.992
Skills	0.00	29	-0.418	0.881
	1.00	211	0.078	0.992
Affection	0.00	29	0.231	0.933
	1.00	211	-0.038	1.009
Creative attitude and self-confidence	0.00	29	0.193	0.776
	1.00	211	-0.019	1.031
Need for achievement	0.00	29	-0.124	0.814
	1.00	211	0.017	1.031
Sense of self-reliance	0.00	29	-0.247	1.019
	1.00	211	0.027	0.999
Attitude to new learning	0.00	29	-0.082	0.971
	1.00	211	0.007	1.013
Attitude to risk and failure	0.00	29	0.190	0.832
	1.00	211	-0.025	1.026

* Notes: 0.00 – engineering background graduates, 1.00 – business background graduates

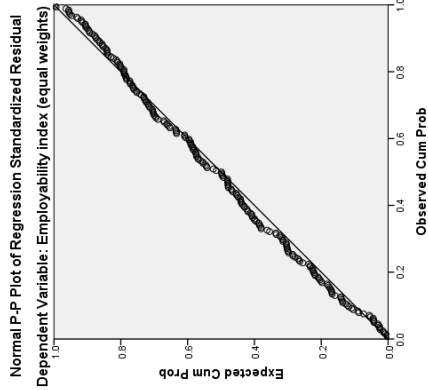
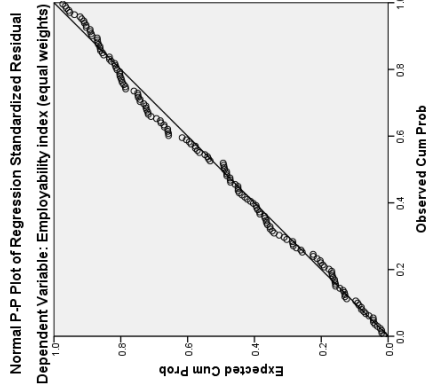
Annex 19 Testing the regression model assumptions

a) Employability (equal weights)

Assumption	<i>Estonian sample</i>	<i>Latvian sample</i>
Independence of errors (residuals).		Albeit it had been quite clear that the observations were unrelated in the current study design, this was ascertained. There was indeed the independence of residuals, as assessed by a Durbin-Watson statistic of 1.772 and 1.979.
A linear relationship between the predictor variables and the dependent variables.		The assumption foresees that: 1) independent variables are linearly related to the dependent variable altogether; 2) each continuous independent variable is linearly related to the dependent variable. <ul style="list-style-type: none"> - The scatterplots of the studentised residuals and the unstandardised predicted values indicated that the relationship was likely to be linear (see the figures below). - Partial regressions plots of the relationships between continuous independent and dependent variables clearly indicated on the linear type of relationships in both samples.
Homoscedasticity of residuals (equal error variances).		In general, the assumption was met (see the scatterplots enclosed with this annex).
No multicollinearity.		The variance inflation factor (VIF) tests were performed to test for multicollinearity. All the variables passed the test on a 0.2 tolerance level (well above the general rule of thumb level of 0.1 corresponding to VIF=10). The VIF values ranged from 1.2 to 2.4.
No significant outliers or influential points.		The VIF values ranged from 1.1 to 1.6. There were two outliers with the SDs of -3.0 and 3.2 – but they were kept in the data as non-extreme (equal and slightly above the cut-off value of +/-3). No influential points were detected.
Residuals normally distributed.		Examination of the normal P-P plots in both samples suggested that the regression standardised residuals were close enough to normal to proceed with the analysis (see the figures below).



The residuals were approximately equally spread over the predicted values of the dependent variable.



The residuals were aligned along the diagonal line in both samples.

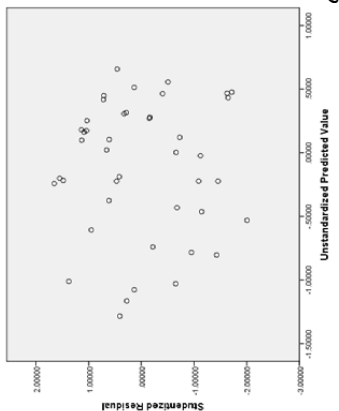
b) Nascent intrapreneurship I

Assumption	<i>Estonian sample</i>	<i>Latvian sample</i>
Independence of cases/errors.	The observations in the dataset were not on before-after measurements or matched pairings; hence the data points were independent from each other.	The observations in the dataset were not on before-after measurements or matched pairings; hence the data points were independent from each other.
A linear relationship between the continuous predictor variables and the logit transformation of the dependent variable.	Using the Box-Tidwell (1962) procedure ⁸ , it was ensured that the assumption is met. Interaction terms between the continuous independent variables, i.e. prior work experience and aspirations, and their log transformations were checked in the logistic regression. None of the terms was significant thus the continuous predictors were linearly related to the log odds.	Using the Box-Tidwell (1962) procedure ⁸ , it was ensured that the assumption is met. Interaction terms between the continuous independent variables, i.e. prior work experience and aspirations, and their log transformations were checked in the logistic regression. None of the terms was significant thus the continuous predictors were linearly related to the log odds.
No multicollinearity.	Judging by the correlation coefficients between the predictor variables, the model had little or no multicollinearity.	Judging by the correlation coefficients between the predictor variables, the model had little or no multicollinearity.
No significant outliers.	1 case with a studentised residual greater than 2.5 was excluded from the analysis.	All the studentised residuals were below +/- 2.5 standard deviations.

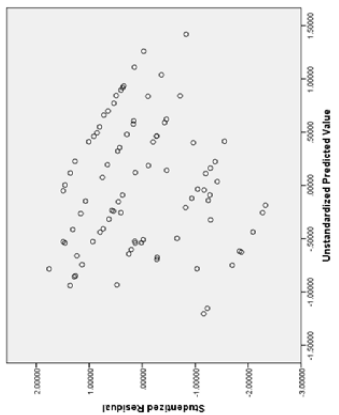
⁸ Box G. E. P. and Tidwell, P. W. (1962), Transformation of the Independent Variables, *Technometrics*, 4, 531-550.

c) Nascent intrapreneurship II

Assumption	<i>Estonian sample</i>	<i>Latvian sample</i>
Independence of residuals.	There was the independence of residuals as assessed by a Durbin-Watson statistic of 1.751 and 2.092.	There was the independence of residuals as assessed by a Durbin-Watson statistic of 1.751 and 2.092.
A linear relationship between the predictor variables and the dependent variables.	<ul style="list-style-type: none"> - The scatterplots of the studentised residuals and the unstandardised predicted values indicated that the relationship was not ideally linear but close to that (see the figures below). - Partial regressions plots of the relationships between continuous independent and dependent variables indicated the linear type of relationships in both samples. 	<ul style="list-style-type: none"> - The scatterplots of the studentised residuals and the unstandardised predicted values indicated that the relationship was not ideally linear but close to that (see the figures below). - Partial regressions plots of the relationships between continuous independent and dependent variables indicated the linear type of relationships in both samples.
Homoscedasticity of residuals.	There were some signs of heteroscedasticity, especially in the Latvian sample (see the scatterplots below), but they were not deemed critical.	There were some signs of heteroscedasticity, especially in the Latvian sample (see the scatterplots below), but they were not deemed critical.
No multicollinearity.	All the variables passed the test on a 0.2 tolerance level (well above the general rule of thumb level of 0.1 corresponding to VIF=10). The VIF values ranged from 1.2 to 1.8.	All the variables passed the test on a 0.2 tolerance level (well above the general rule of thumb level of 0.1 corresponding to VIF=10). The VIF values ranged from 1.1 to 1.8.
No significant outliers or influential points.	All the cases had stand. residuals less than +/- 3 standard deviations. There were no Cook's Distance values above 1 that could be considered as influential.	All the cases had stand. residuals less than +/- 3 standard deviations. There were no Cook's Distance values above 1 that could be considered as influential.
Residuals normally distributed.	Examination of the normal P-P plots of the regression standardised residuals in both samples suggested that the distribution was close to normal to proceed with the analysis (see the figures below).	Examination of the normal P-P plots of the regression standardised residuals in both samples suggested that the distribution was close to normal to proceed with the analysis (see the figures below).



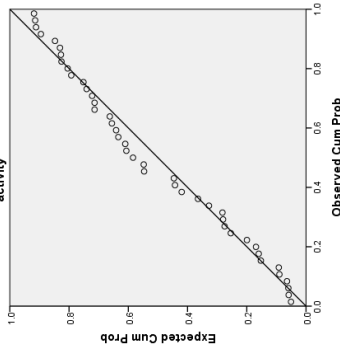
est



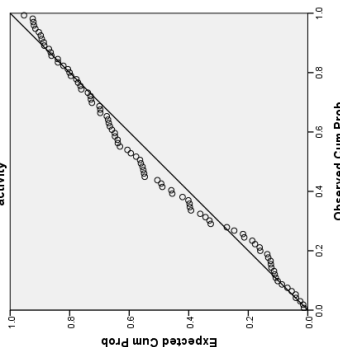
lv

Some residuals were not equally spread over the predicted values of the dependent variable. In general, they were close to being spread approximately equally (less so in the Latvian sample).

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Idea development and implementation in intrapreneurial activity



Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Idea development and implementation in intrapreneurial activity



The residuals were aligned along the diagonal line in both samples though farer from ideally than in the case of employability.

d) Private early-stage EA

Assumption	<i>Estonian sample</i>	<i>Latvian sample</i>
Independence of cases/errors.		
A linear relationship between the continuous predictor variables and the logit transformation of the dependent variable.	The assumption was met a priori as in the previous logit regression. Using the Box-Tidwell (1962) procedure, it was ensured that the assumption is met. Interaction terms between the continuous independent variables, i.e. prior entrepreneurship experience, aspirations, network, and their log transformations were checked in the logistic regression. None of the terms was significant thus the continuous predictors were linearly related to the log odds.	
No multicollinearity.	Judging by the correlation coefficients between the predictor variables, the models had little or no multicollinearity.	
No significant outliers.	1 case with a studentised residual equal to 2.6 standard deviations was excluded from the analysis. There were no influential points.	1 case with a studentised residual equal to 2.8 standard deviations was excluded from the analysis. There were no influential points.

Annex 20 Regressions of employability (weighted composite)

Differences in descriptives between the weighted and unweighted (equal weights assumed) employability composites:

Descriptives	<i>Estonian sample</i>					<i>Latvian sample</i>				
	N	Min	Max	Mean	SD	N	Min	Max	Mean	SD
Employability – equal weights	157	-1.11	0.88	0.00	0.42	236	-1.41	1.00	0.00	0.46
Employability – weighted	157	-12.07	9.08	0.03	4.31	236	-12.66	9.37	-0.12	4.20

a) Effects of the learning outcomes on the graduate employability

Estonian sample	<i>Dependent variable: Employability (weighted)</i>							
	Model 1		Model 2		Model 3		Model 4	
<i>Independent variables:</i>	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Parent-entrepreneur	-0.009	0.074	-0.026	0.070	-0.009	0.065	-0.015	0.062
Parent-manager	-0.012	0.079	-0.039	0.073	-0.038	0.068	-0.029	0.066
Gender	-0.188**	0.071	-0.050	0.069	-0.072	0.065	-0.059	0.063
Age	0.112**	0.041	0.016	0.045	0.000	0.042	0.014	0.041
Graduate status	-0.015	0.071	0.042	0.067	.022	0.063	0.024	0.061
Doing MA	0.104	0.104	0.041	0.095	-0.036	0.091	-0.015	0.089
Prior knowledge			0.029	0.045	-0.007	0.043	0.002	0.041
Prior e-ship experience			0.073	0.048	0.070	0.045	0.068	0.044
Prior work experience			0.090*	0.039	0.078*	0.037	0.076*	0.035
Entrep. proclivity			0.064+	0.033	0.042	0.031	-0.003	0.033
Managerial proclivity			-0.029	0.033	-0.032	0.031	-0.048	0.030
Past intrapreneurship			0.248**	0.072	0.272***	0.068	0.224**	0.066
Entrep.network					0.127***	0.028	0.104***	0.027
Cognitive outcomes							-0.004	0.033
Skill-based outcomes							0.012	0.034
Affective outcomes							0.281***	0.075
(Constant)	-0.075	0.111	-0.448	0.153	-0.605	0.147	-0.373	0.153
N	157		157		157		157	
F-value	2.829		5.083		6.918		7.240	
p-level	0.012		0.000		0.000		0.000	
R ²	0.102		0.298		0.386		0.453	
ΔR ²	0.102*		0.196***		0.089***		0.067**	
adj. R ²	0.066		0.239		0.330		0.390	

Notes: +p<0.10; *p<0.05; **p<0.01; ***p<0.001.

Latvian sample	<i>Dependent variable: Employability (weighted)</i>							
	Model 1		Model 2		Model 3		Model 4	
<i>Independent variables:</i>	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Parent-entrepreneur	0.110	0.067	0.060	0.061	0.025	0.062	0.023	0.060
Parent-manager	0.148*	0.064	0.065	0.061	0.067	0.060	0.064	0.058
Gender	-0.055***	0.059	0.001	0.054	-0.014	0.053	-0.014	0.052
Age	0.186	0.049	0.058	0.050	0.061	0.049	0.071	0.047
Graduate status	0.007	0.067	0.021	0.062	0.016	0.061	0.015	0.060
Doing MA	-0.082	0.084	-0.103	0.077	-0.111	0.076	-0.104	0.073
Prior knowledge			0.006	0.039	-0.016	0.039	-0.015	0.038
Prior e-ship experience			0.102**	0.039	0.091*	0.039	0.098**	0.038
Prior work experience			0.061+	0.033	0.058+	0.033	0.061+	0.032
Entrep. proclivity			0.048*	0.024	0.039+	0.023	-0.013	0.026
Managerial proclivity			0.037	0.030	0.032	0.030	0.016	0.029
Past intrapreneurship			0.313***	0.061	0.285***	0.061	0.238***	0.060
Entrep.network					0.067**	0.023	0.049*	0.023
Cognitive outcomes							0.010	0.032
Skill-based outcomes							0.013	0.032
Affective outcomes							0.279***	0.068
(Constant)	-0.337	0.102	-0.687	0.146	-0.721	0.144	-0.433	0.154
N	235		235		235		235	
F-value	3.996		7.382		7.711		7.914	
p-level	0.001		0.000		0.000		0.000	
R ²	0.095		0.285		0.312		0.367	
ΔR ²	0.095**		0.190***		0.027**		0.055***	
adj. R ²	0.071		0.247		0.272		0.321	

Notes: +p<0.10; *p<0.05; **p<0.01; ***p<0.001.

b) Effects of the intervention type on the graduate employability

<i>Independent variables:</i>	<i>Dependent variable: Employability (weighted)</i>					
	Model 5: Estonia			Model 5: Latvia		
	B	S.E.	C.I.	B	S.E.	C.I.
Parent-entrepreneur	-0.026	0.063	[-0.151; 0.098]	0.029	0.060	[-0.089; 0.147]
Parent-manager	-0.016	0.067	[-0.149; 0.117]	0.064	0.058	[-0.051; 0.179]
Gender	-0.039	0.064	[-0.165; 0.087]	-0.035	0.053	[-0.139; 0.070]
Age	0.025	0.042	[-0.058; 0.108]	0.070	0.049	[-0.026; 0.167]
Graduate status	0.006	0.062	[-0.116; 0.129]	0.066	0.067	[-0.066; 0.198]
Doing MA	0.033	0.096	[-0.157; 0.222]	-0.133 ⁺	0.075	[-0.280; 0.015]
Prior knowledge	0.007	0.042	[-0.076; 0.090]	-0.017	0.038	[-0.092; 0.058]
Prior e-ship experience	0.061	0.044	[-0.026; 0.148]	0.104 ^{**}	0.038	[0.028; 0.179]
Prior work experience	0.069 ⁺	0.036	[-0.003; 0.141]	0.054 ⁺	0.032	[-0.009; 0.117]
Entrep. proclivity	0.008	0.034	[-0.060; 0.075]	-0.024	0.026	[-0.076; 0.028]
Managerial proclivity	-0.054 ⁺	0.031	[-0.115; 0.008]	0.014	0.029	[-0.043; 0.071]
Past intrapreneurship	0.254 ^{***}	0.070	[0.115; 0.394]	0.226 ^{***}	0.060	[0.108; 0.344]
Entrep.network	0.107 ^{***}	0.028	[0.051; 0.162]	0.048 [*]	0.023	[0.003; 0.092]
Cognitive outcomes	-0.010	0.033	[-0.076; 0.056]	0.007	0.032	[-0.056; 0.070]
Skill-based outcomes	0.015	0.034	[-0.052; 0.083]	0.015	0.032	[-0.048; 0.077]
Affective outcomes	0.293 ^{***}	0.075	[0.145; 0.441]	0.280 ^{***}	0.068	[0.145; 0.415]
HEI A/E	0.016	0.088	[-0.158; 0.190]	0.010	0.081	[-0.149; 0.169]
HEI B/F	0.175	0.108	[-0.039; 0.390]	0.129 ⁺	0.069	[-0.007; 0.265]
HEI D/H	0.086	0.086	[-0.084; 0.256]	0.141	0.103	[-0.062; 0.344]
(Constant)	-0.486	0.176		-0.462	0.154	
N	157			235		
F-value	6.311			6.996		
p-level	0.000			0.000		
R ²	0.467			0.382		
ΔR^2	0.014			0.015		
adj. R ²	0.393			0.327		

Notes: +p<0.10; *p<0.05; **p<0.01; ***p<0.001.

Annex 21 Partial correlations between the subjective and objective outcomes of EE by the form of intervention

a) *Estonian sample*

Intervention	Variables	Cognitive outcomes	Skill-based outcomes	Affective outcomes
Traditional	Employability (N=126)	0.040	0.007	0.310***
	Nascent intrap. I (N=171)	0.137+	0.164*	0.134*
	Nascent intrap. II (N=46)	0.241	0.326*	0.319*
	Early-stage EA (N=169)	0.034	0.095	0.191*
Experiential	Employability (N=23)	0.146	0.110	0.244
	Nascent intrap. I (N=34)	0.169	0.130	0.236
	Nascent intrap. II (N=17)	-0.009	-0.060	0.155
	Early-stage EA (N=32)	0.128	0.054	-0.047

Notes: 1) Controls: employability – prior work experience, past intrapreneurship, network; nascent intrapreneurship I – past intrapreneurship, prior proclivity; nascent intrapreneurship II – past intrapreneurship; early-stage EA: parent-entrepreneur, graduate status, prior proclivity, prior e-ship experience. 2) Significance (2-tailed): + $p < 0.10$, * $p < 0.05$, *** $p < 0.001$.

b) *Latvian sample*

Intervention	Variables	Cognitive outcomes	Skill-based outcomes	Affective outcomes
Traditional	Employability (N=66)	0.139	0.061	0.324**
	Nascent intrap. I (N=93)	-0.012	-0.047	0.092
	Nascent intrap. II (N=29)	0.021	-0.038	0.079
	Early-stage EA (N=92)	-0.210*	-0.038	0.231*
Experiential	Employability (N=159)	0.051	0.088	0.288***
	Nascent intrap. I (N=207)	-0.023	-0.002	0.038
	Nascent intrap. II (N=76)	0.020	0.191+	0.239*
	Early-stage EA (N=205)	-0.087	0.003	0.235**

Notes: 1) Controls: employability – prior entrepreneurship and work experience, past intrapreneurship, network; nascent intrapreneurship I – past intrapreneurship, parent-entrepreneur; nascent intrapreneurship II – network, past intrapreneurship; early-stage EA: gender, prior work experience, network. 2) Significance (2-tailed): + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

THE AUTHOR'S PUBLICATIONS AND CONFERENCE PRESENTATIONS

I. Book chapters

- 1) Kozlinska, I., Mets, T., and Rõigas, K. (forthcoming in 2017) "Perceived Learning Outcomes of Experiential Entrepreneurship Education: the Case of Latvian Business Schools", in Santos, S., Caetano, A., Mitchell, C., Landström, H. and Fayolle, A. (eds.), *The Emergence of Entrepreneurial Behaviour: Intention, Education and Orientation*, Cheltenham, UK, and Northampton, MA, USA: Edward Elgar.

II. Articles in international journals

- 1) Mets, T., Kozlinska, I., and Raudsaar, M. (forthcoming in 2017) "Patterns in Entrepreneurial Competences as Perceived Learning Outcomes of Entrepreneurship Education: the Case of Estonian HEIs", *Industry and Higher Education*. Special issue: The effectiveness of entrepreneurial training programmes: how should we measure it?
- 2) Kozlinska, I. (2012) "Teachability Quest in Entrepreneurship Research", *Socialiniai Tyrimai = Social Research*, 4 (29), 69-81.
- 3) Kozlinska, I. (2012) "Obstacles to University-Industry Cooperation in the Domain of Entrepreneurship", *Journal of Business Management*, 6, 153-160.
- 4) Kozlinska, I. (2011) "Current Trends in Entrepreneurship Education: Challenges for Latvia and Lithuania", *Socialiniai Tyrimai = Social Research*, 4 (25), 75-88.
- 5) Kozlinska, I. (2011) "Contemporary Approaches to Entrepreneurship Education", *Journal of Business Management*, 4, 205-220.

III. Conference publications

- 1) Kozlinska, I., Mets, T., Rõigas, K. (2014) "Learning Outcomes Paradox of Entrepreneurship Education Impact in Leading Business Schools of Latvia". *Proceedings of the Entrepreneurship Summer University (ESU) Conference at University Institute of Lisbon (ISCTE-IUL)*, 14-26.

IV. Other publications

- 1) Kozlinska, I., Mets, T., Paalzow, A. and the CB Entreint project team (2013) "Central Balticum Entrepreneurship Interaction. Analysis of Entrepreneurship Educators' Training Needs and Practices", Aalto University Publication Series *Business+Economy*, 4, Helsinki: Unigrafia OY.
- 2) Kozlinska, I. (2012) "Fundamental View of the Outcomes of Entrepreneurship Education", *University of Tartu Faculty of Economics and Business Administration Working Paper Series*, 90, 3-28.

V. *Selected conference presentations*

- 1) Learning Outcomes of Entrepreneurship Education and Occupational Status Choices of Bachelor Business Graduates in Estonia and Latvia. *ESU conference*, 11-16 September 2016, EM Lyon Business School, Lyon, France.
- 2) Education- and Enterprise-Level Outcomes of Teaching Entrepreneurship to Undergraduate Business Students – Is there a Quantifiable Connection? *ESU conference*, 16-22 August 2015, Southampton Solent University, Southampton, United Kingdom.
- 3) Perceived Learning Outcomes of Experiential Entrepreneurship Education: the Case of Latvian Business Schools. *The 8th ICEIRD conference*, 18-19 June 2015, University of Sheffield, Sheffield, United Kingdom.
- 4) Measuring Learning Outcomes of Entrepreneurship Education Using Structural Equation Modelling. *The 8th Entrepreneurship Education Conference (YKTT), Enterprise Education Vol. 2*, 25-26 September 2014, Seinäjoki University of Applied Sciences, Seinäjoki, Finland.
- 5) Traditional vs. Experiential Entrepreneurship Education: a Comparison of the Learning Outcomes. *The 2nd ECSB Entrepreneurship Education (3E) conference, Rethinking Entrepreneurship Education, Training and Policy: Questions We Care About*, 10-11 April 2014, Turku School of Economics, Turku, Finland.
- 6) Qualitative Analysis of Entrepreneurship Educators' Needs and Practices. *The 7th YKTT Conference, Entrepreneurial Ecosystems*, 26-27 September 2013, Aalto University School of Business, Helsinki, Finland.
- 7) How to Train Entrepreneurship Educators? Evidence from CB Entreint Project. *The 18th Baltic Dynamics Conference, Competence Building for Smart Growth: Challenges and Opportunities*, 11-13 September 2013, Riga, Latvia.
- 8) Learning Outcomes Paradox of Entrepreneurship Education Impact in Leading Business Schools of Latvia. *ESU Conference*, 19-23 August 2013, ISCTE-IUL, Lisbon, Portugal.
- 9) Fundamental View of the Outcomes of Entrepreneurship Education. *ESU Conference*, 19-25 August 2012, University of Southern Denmark, Kolding, Denmark.
- 10) Current Trends in Entrepreneurship Education: Challenges for Latvia and Lithuania. *The 11th Ernestas Galvanauskas Conference, Increasing Regional Competitiveness: Interaction Between Science and Business*, 17-18 November 2011, Šiauliai University, Šiauliai, Lithuania.

VI. *Seminar presentations*

- 1) Research Seminar “*Linkages Between Entrepreneurial Education and Entrepreneurship Revisited: Evidence from Two Post-Transition Countries*”, Aston Business School, Aston University, 27 November 2015, Birmingham, United Kingdom.
- 2) Research Seminar Series in Entrepreneurship, on preliminary results of the doctoral thesis, Turku School of Economics, 7 October 2015, Turku, Finland.
- 3) Open Workshop Series in Business and Management Studies, “*Entrepreneurial Education and Enterprise: the Case of Latvian Students and Graduates*”, Stockholm School of Economics in Riga, 6 March 2015, Riga, Latvia.

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Education:

2013 – present *University of Tartu, School of Economics and Business Administration; University of Turku, School of Economics, PhD candidate. Joint doctoral programme (Cotutelle agreement).*

2012 – 2013 *University of Tartu, School of Economics and Business Administration, Centre for Entrepreneurship, visiting PhD student.*

2011 – 2013 *BA School of Business and Finance, Riga International School of Economics and Business Administration, and Ventspils University College, inter-university doctoral study programme, PhD student.*

2007 – 2009 *BA School of Business and Finance, SBS Swiss Business School. Master of Business Administration (MBA) in Global Finance and Banking. Joint degree.*

2005 – 2007 *University of Central Lancashire (UCLan), BA (Hons) Marketing with Business.*

2003 – 2005 *University of Latvia, Faculty of Economics and Management, two years of the Bachelor of Business Administration programme.*

1991 – 2003 *Riga Secondary School No. 40. Secondary education with specialisation in English and French languages.*

IT skills: SPSS, AMOS, NVivo, MS Office, RefWorks

Language skills (on the ILR scale):

- | | |
|--|---|
| a) English – full professional proficiency | c) Latvian – professional working proficiency |
| b) French – limited working proficiency | d) Russian – native or bilingual proficiency |

Employment:

2016 – present	<i>Aston University, Aston Business School</i> (United Kingdom). Research fellow; SEFORIS project (Social Entrepreneurship as a Force for More Inclusive and Innovative Societies).
2013 – 2016	<i>Stockholm School of Economics in Riga</i> (Latvia). Junior teaching fellow role in Research Methods for B.Sc. Thesis, ad hoc.
2012 – 2013	<i>University of Tartu, School of Economics and Business Administration, Centre for Entrepreneurship</i> (Estonia). Junior research fellow in entrepreneurship; CB ENTREINT project researcher (Central Balticum Entrepreneurship Interaction, Central Baltic INTERREG IV A programme 2007-2013).
2007 – 2011	<i>Joint-Stock Company “Rietumu Banka”</i> (Latvia). Marketing analyst, marketing and PR specialist, project manager, internal communications manager.
2006 – 2007	<i>University of Central Lancashire</i> (United Kingdom). Student ambassador, ad hoc (campus tours for new applicants).
2003 – 2005	<i>University of Latvia, Faculty of Economics and Business Administration</i> (Latvia). Student office assistant.

Professional development activities:

Chair and/or discussant at the 3E, ESU, and YKTT conferences.

Refereeing work for Journal of Small Business Management, Baltic Journal of Management, Thinking Skills and Creativity, Journal of Business Management.

Selected awards:

- The Highly Commended Paper Award for the paper “*Education- and Enterprise-Level Outcomes of Teaching Entrepreneurship to Undergraduate Business Students – Is there a Quantifiable Connection?*” (with Tõnis Mets, ESU Conference 2015).
- The Best Paper Award for the paper “*Measuring Learning Outcomes of Entrepreneurship Education Using Structural Equation Modelling*” (with Tõnis Mets and Kärt Rõigas, YKTT Conference 2014).
- The Best Paper Award for the paper “*Learning Outcomes Paradox of Entrepreneurship Education Impact in Leading Business Schools of Latvia*” (with Tõnis Mets and Kärt Rõigas, ESU Conference 2013).

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