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2006

Online at <http://mpra.ub.uni-muenchen.de/4331/>
MPRA Paper No. 4331, posted 2. August 2007

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1. Abstract

The target audiences for entrepreneurial university studies are most often students of different fields of business studies, or economics; entrepreneurship studies are a part of their normal curriculum. Entrepreneurs, however, are not a group that consists only of business professionals, but a group of people from all walks of life. The basic procedures and laws governing the starting of a company are most often same for all companies and individuals. It is important to acknowledge these two facts, when designing curriculums for university studies: basic courses in entrepreneurship (starting a business) are important for students of all disciplines. This paper reports experiences from educating multi-disciplinary student groups in entrepreneurship, presents preliminary data about student background and attitudes towards entrepreneurship, and discusses some lessons learned from the experiences.

KEYWORDS: Entrepreneurship education, multi-disciplinary groups, lessons learned

2. Introduction

Recently, the interest in, and the adoption of, entrepreneurship education in higher education has been increasing in Finland. This is, most likely, due to the more generally dispersed perception that universities and polytechnics are expected to play a new role in the society, in

addition to research and teaching (Etzkowitz. et al., 2000). The recentness of focusing on entrepreneurial education seems to be true also in Sweden, where Rasmussen and Sørheim found that the extent of entrepreneurship education, in the five universities they studied, has dramatically grown in the last few years (Rasmussen and Sørheim, 2006). Carayannis et al. also report that entrepreneurship education is a recent phenomenon also in France (Carayannis et al., 2003). In Finland, like in a number of other countries, the new role, also dubbed as the "third mission" includes promotion of regional and national economic development. Creation of new entrepreneurs and entrepreneurship education is seen as part of this mission.

The recentness in focusing on entrepreneurship education, is however, not applicable to the United States, where entrepreneurship education in business schools has, according to (Katz, 2003) reached maturity. Indeed, the numbers Katz exhibits are interesting; over 1600 schools (university level) with 2200 courses, in what can be classified as entrepreneurship education. Katz also mentions the fact that entrepreneurship education is spreading outside its' "natural habitat", the business schools, to schools primarily concentrated in other areas, e.g., agriculture and engineering (Katz, 2003). This, in our view is normal and positive, as not only business school laureates will become entrepreneurs, Katz however, feels that this will change the position of business schools, vis a vis, other educational institutions. Summa summarum, it seems that there is a considerable gap in entrepreneurial education activity between the U.S. and European countries. This work is based on experiences from a Finnish higher education institution with six years of active entrepreneurship education, therefore, also a rather recent activity.

In addition to studies about how much entrepreneurial education is available in different nations, student attitudes towards entrepreneurship have also been an interest of research. (Carayannis et al., 2003) describe the differences between the entrepreneurial cultures of the U.S. and France, and report findings on surveys collected from four groups of French students about their attitudes towards entrepreneurship. Their findings seem to suggest that attitudes of students who have undergone an entrepreneurship education course seem to be different from attitudes of students with no entrepreneurship education. If the attitudes can be characterized as more positive, no conclusions are drawn. (Wang and Wong, 2004) have studied entrepreneurial interest of university students in Singapore. They find that entrepreneurial

interest is high among university students and test for how their family background and personal characteristics affect their interest.

There are also studies that concentrate on the relationship between an entrepreneur's educational and experiential background and the success of start-up companies. It seems to be the general perception that for high technology companies education has a significance (e.g., Van de Ven et al., 1984), however, for general (non high-tech) companies education does not seem to be equally important (e.g., Sandberg and Hofer, 1987). Views on how entrepreneurial, or management, experience affect the performance seem to be quite mixed, (Stuart and Abetti, 1990) find that there is a positive correlation to previous start-up experience with success, (Sandberg and Hofer, 1987) find no significant influence, and (Van de Ven et al., 1984) find a negative effect from previous entrepreneurial experience. As concluded above, it seems that in Europe entrepreneurship education has, at least in a larger scale, grown rather recently, this may be a reason why we have been unable to find results that would indicate how European entrepreneurial education affects start-up performance.

This work presents some preliminary descriptive statistics about the entrepreneurial background and attitudes towards entrepreneurship of about 120 first year University of Applied Sciences (previously Polytechnic) students.

Rasmussen and Sørheim present how in five Swedish universities entrepreneurship education is taken into consideration in curriculums, and how the studied universities employ student-based and mostly action-based, or learning-by-doing, methods (Rasmussen and Sørheim, 2006). The paper does not, however, provide insights into success factors of these learning-by-doing entrepreneurship education methods. In depth discussion about delivery of entrepreneurial education content is provided in (Fiet, 2000), where he discusses, e.g., the teacher's role in delivering theory based education (in entrepreneurship) and how entrepreneurship education can be made attractive to students, despite the theoretical nature of the subject matter. (Okudan and Rzasa, 2006) present a course in entrepreneurial leadership at the Pennsylvania State University (U.S.) in detail, also exploring student perceptions about the course (collected comments from students). The course they describe is project based, i.e., learning-by-doing course.

A recent European Commission report about (student) mini enterprises in secondary education presents some best practices in entrepreneurial education, of which, some may also be applicable in higher education (Euroopan Komissio, 2005). The report identified 80 mini-enterprise based entrepreneurship education programs for secondary education in 22 European countries during the school year 2003-4. It is our feeling that secondary education institutions in Europe have more practice and learning-by-doing oriented entrepreneurship programs than European higher level institutions; this is, per se, an interesting issue.

The main focus of this paper is on lessons learned from experiences with learning-by-doing oriented entrepreneurial education, conducted with multi-discipline student groups. Special attention is given to issues that, we feel, have been successful in motivating and enabling learning in multi-discipline student groups.

This paper continues by illustrating entrepreneurship education in the Turku University of Applied Sciences Salo unit, and a more detailed description of a practice enterprise course that took place during the school year 2005-2006. Some preliminary descriptive statistics from a survey about the participating students' perceptions about entrepreneurship are presented. A number of practical lessons learned, from the practice enterprise course are, presented and discussed. The paper closes with a summary and conclusions.

3. Experiences in Entrepreneurship Education

Turku University of Applied Sciences in Salo has some six years of experience with organizing a course in entrepreneurship, called the practice enterprise project. This section describes the realization of the practice enterprise project that was started for the year 2005 and ended in May 2006. Further some preliminary results from an exploratory survey collected from students in the beginning of the practice enterprise project, in October 2005, are presented.

3.1. The practice enterprise project at the Turku University of Applied Sciences in Salo in 2005 - 2006

The practice enterprise project is a course that is given to all students starting their first year of study at the Turku University of Applied Sciences Salo unit. The project is a compulsory part of

their curriculum, and is compulsory for students from 6 different degree programs (multi-disciplinary students). Total amount of students that started in October 2005 was close to 200. About 20 staff members are involved in the project, 14 as teacher tutors. Students were divided into 16 practice enterprise (PE) groups, of which, 6 operate in English, and the rest in Finnish. Each group includes students from, at least, three different degree programs. In addition to being multi-disciplinary, the English speaking groups are multi-ethnic; altogether ten different nationalities are represented.

Each group has a background company that is a small, or a medium size, company operating in the Salo-area. Each student group uses the business idea of their background company as a basis for the operations of their practice enterprise. The groups visit their background company and prepare a set of questions for the entrepreneur, to find out about the business, and to understand how the company operates. It is our experience that the local company managers are very helpful and tend to easily take a "teaching" role, thus facilitating the contact with the students.

The practice enterprises operate with virtual money and resources, however, as realistically as possible. The groups' operations are facilitated by infrastructure provided by the Finnish Practice Enterprise Center (FINPEC) that provides the PE's with services like virtual banking, and acts as "the authorities", providing societal functions like, e.g., taxation, business register services, and social security services.

The project has a strong learning-by-doing focus. One of the principles of the project is that the students, as groups, are responsible for the success of their PE (and their own learning), which makes the tutor teachers, observers and mentors, rather than teachers in the traditional sense of the word. Group responsibility for the given tasks and learning are hoped to enhance the students' abilities to manage work, to resolve problems, to work under uncertainty, and to work in groups. During an initial period of "grouping" the students in the PE groups get to know each other, the initial phase is closely monitored and facilitated by the teacher tutor. After getting to know each other and having gone through the functions of a start-up company (and the schedule for the project) the students assign different responsibilities to the members of the group, i.e., the CEO and other functionaries of the companies are appointed. Each PE also has a board of directors that consists of students. An example of the independence and responsibility

given to the groups is the power of the groups, with a unanimous decision, to fire group members. Such decisions are, naturally, always presented to the tutor teacher before any action is permitted.

The project includes a series of lectures to support and guide the PE groups' activities. Topics covered during the lectures include, e.g., business idea and business plan, founding a company (bureaucracy & legal issues), financing of a start-up (public support and lending), venture capital, sales, marketing, and internationalization, accounting and taxes, working contracts and law, and long term planning and strategy. Most of the covered topics carry with them assignments for the PE groups, they must, e.g., draft a business plan and a budget, keep accounts and pay taxes (filing the necessary documents) and design www-pages and marketing documents for their PE.

A normal "chain of events" in a PE is that there is a lesson on a given topic (e.g., business plan), after which the group is given a task and needs to take action (e.g., task to write a business plan). Then the task, which usually means producing an artifact (e.g., a ready business plan), is controlled by the tutor teacher and/or presented by the group to the other PE groups (e.g., marketing presentation). The ready artifact is also possibly used in a further action, i.e., implemented in use (e.g., the business plan is used in banking negotiations).

The most important "implementations" are banking negotiations with representatives of local banks (where the business plan and the budget are scrutinized), and a PE business fair (where sales and marketing skills are put to action). The best performing PE is selected from the business fair, a fact that causes the groups to put a lot of effort into their PE fair stands and performance.

In addition to attending lectures, being active in the operations of their PE, and in creating artifacts the students must individually pass three tests based on three selected books, on entrepreneurship, accounting & finance, and on marketing. The students must, as a group, pass a group test, which is a set of tasks for the whole group to answer in a limited time (2 hours). The group test is graded based on both, the ability to work as a group and on the answers the group has been able to produce. The students are also required to perform a peer-evaluation the other group members, and a self-evaluation, on how well they are doing in the group (a

scale of 0-5 is used for the peer-evaluation and a scale of 1-5 for the self-evaluation). These evaluations are done twice during the project, and the first evaluation is followed by an individual discussion session with the group tutor teacher. All students participating are also required to pass a course in the English language that is based on the practice enterprise project substance. Each group also prepares a "final folder", where all the artifacts are collected and the operation of the group for the duration of the whole project is presented. The tutor teacher uses the above information to give the project participants a final course grade.

More information about, the previous implementations of, the practice enterprise course can be found from (Heikkiniemi, 2004).

3.2. Preliminary results from an exploratory questionnaire collected from students in the beginning of the practice enterprise project in October 2005

A questionnaire was drafted to ask the students about their attitudes towards entrepreneurship, about entrepreneurial activities in their family, and about their previous working experience. They were also asked to specify the field in which they had worked and of the company of their family. The students were also asked if they have a company of their own.

The results of the questionnaire were used to build the practice enterprise groups with the underlying idea that each group should include a number of students who indicate interest in entrepreneurship.

The questionnaire was answered to by 122 students (n=122) from nine different student groups participating in the project. Of the respondents 43% (52) were female and 67% (70) male. As the population is limited (small) no generalizations are attempted, however, the results obtained can be used to give some preliminary indications as to what kind of attitudes first year, university of applied sciences, students have towards entrepreneurship. Table 1 summarizes some of the results of from the survey.

Population n=122	Sex	Work experience	Interest in entrepreneurship	Parents or relatives have a company	Is there a generation shift coming?
Sex	f=52	f: yes=51	F: yes=27	f: yes=29	f: yes=6

	m=7 o	no=1 m: yes=63 no=6	no=25 m: yes=48 no=22	no=23 m: yes=29 no=48	no=46 m: yes=6 no=64
Work experience	lbid	yes=115 no=7	yes: yes=70 no=45 no: yes=5 no=2	yes: yes=56 no=59 no: yes=2 no=5	yes: yes=12 no=103 no: yes=0 no=0
Interest in entrepreneurship	lbid	lbid	yes=75 no=47	yes: yes=39 no=36 no: yes=19 no=28	yes: yes=7 no=68 no: yes=5 no=42
Parents or relatives have a company	lbid	lbid	lbid	yes=58 no=64	<i>yes: yes=12</i> <i>no=46</i> <i>no: yes=0</i> <i>no=0</i>
Is there a generation shift coming?	lbid	lbid	lbid	lbid	yes=12 no=110

Table 1. Descriptive statistics and combinations of variables as absolute numbers from the exploratory survey made among the students starting the practice enterprise project in October 2005

More than half, 61,5%, of the respondents indicated they were interested in entrepreneurship or starting their own business. When we look at the perceptions of female and male students separately we find that 51,9% of the female respondents and 68,5% of male respondents indicate interest in entrepreneurship or starting their own business. There would seem to be a significant difference between females' and males' perceptions.

Clear majority of the respondents, 94,3%, indicated having working experience. This result seems high. Of the respondents that indicated having working experience 60,8% indicated also

interest in entrepreneurship, or starting their own business. This does not seem to deviate from the above results.

Almost half of the respondents, 47,5%, indicated that their parents, or close relatives, have an enterprise. Interestingly 67,2% of those who indicated having parents, or close relatives, having an enterprise reported also interest in entrepreneurship. This figure does not seem to be very much higher than the overall interest in entrepreneurship. One might have expected the sons and daughters of entrepreneurs to have a significantly larger interest in entrepreneurship than the rest of the population. On a following question 20,7% of the respondents who indicated that their parents, or close relatives have, an enterprise reported that there is going to be a generation change in the ownership of the company. Interestingly, 58,3% of the respondents that indicated a coming generation change in their parents, or close relatives, company indicated interest in entrepreneurship. This is interesting, because the figure is lower than the overall interest in entrepreneurship in the population. However, as the number of respondents indicating a generation change is low, $n=12$, the result is not reliable and can be biased.

Two respondents indicated that they have a company of their own. As the n is so small we excluded it from any further analysis. The questionnaire and the raw data are available at request from the authors.

4. Some lessons learned from the practice enterprise project

In this section we will discuss some lessons that we have learned during the practice enterprise project at the Turku University of Applied Sciences Salo unit. By lessons learned we mean a set of issues that we feel have been particularly well-suited for the practice enterprise project, and especially supportive for learning in multi-disciplinary student groups.

Lesson 1: informing the students why they are taking a practice enterprise course is the key in the motivation building of an individual student and in the success of the project.

We feel that it is of paramount importance that the involved students get a sensation of direction in the beginning of their course experience. The question that must be answered is:

"Why am I taking this course?". The question is a very relevant one, because if a student is unaware of the importance, and the benefits, of learning about entrepreneurship and operations of a company, the goal of the course is missing for him/her. Finding the motivation for a learning-by-doing course in entrepreneurial business will most likely not be a problem for business students, however, when we are dealing with multi-disciplinary student groups (e.g., technical and nursing students in groups with business students) the issue becomes highly relevant.

The students' understanding of the goals of the course and the personal fit must be further reminded during the course for the motivation to last. It is our experience that reminding is best delivered by having guest lectures by entrepreneurs from different fields (in our case, e.g., healthcare, IT, and marketing). When there is a contact to an entrepreneur from a student's "own" field, the understanding of the need for the skills taught during the course deepens, deepening also the student motivation.

Lesson 2: Having a background company that the students can relate to is important in bridging the gap between the practice enterprise project and the reality in real world companies.

It is our experience that the sooner the multi-disciplinary practice enterprise student group has the chance to visit their background company, the better they will understand what is expected of them during the course. We feel this is due to the fact that a visit to a "real" company not only creates a mental image of what a company is, but also a sense of direction for the learning; theory is not learned for theory's sake, but for an actual reason. This is especially important in multi-disciplinary groups, as business students often already have an interest in learning about entrepreneurship. For a nursing, or engineering, student a visit to a real company may be a first-time experience and at that a very positive one. It is important to try to make the students see beyond the products of the company, e.g., if a background company sells metal products it still has an organization of people and must adhere to the same legal system, pay taxes, etc. as a company involved in providing occupational health services. During the project the students may contact the background company for support and questions.

Lesson 3: putting responsibility on students as individuals, and on the group as a whole, seems (and is hoped) to enhance the future readiness of students to cope with uncertainty and their ability to work in (multi-disciplinary) groups

It is our experience that when the students are given a responsibility for themselves, in groups, they will not immediately understand the measures that they must take to ensure the working of the group and following of the rules that they, as a group, have established (having to do with being present and with organization of work). It is usual that in the beginning of the project the students are careful and seem to avoid stepping on each others toes. However, when the first important deadlines start to approach, the groups start finding ways to require the group members to be active. This process of group self-regulation usually takes six to eight weeks to develop. The teacher tutor is often required to remind the group that they are responsible for fulfilling the given tasks themselves.

Failures that are caused by negligence in following the group's rules and in delivering the individual inputs cause the groups to experience stress and feelings of anxiety. There will most often be a period of turmoil, during which the group members settle with each other and establish their positions within the group. This is usually when the most committed individuals usually take charge. In multi-disciplinary, and especially in multi-ethnic, groups this stage enhances the communication skills between the students. Issues like planning and organization usually become more important to the group members, due to the fact that the groups know the "special skills" of each group member.

An interesting point to note is that, in some cases, it has been difficult to the tutor teachers to delegate the responsibility to the students. This may be due to the fact that the tutor teachers do not want to see "their" group fail.

Lesson 4: Implementing the prepared artifacts is important from the point of view of motivation - deeper sense of understanding about how, e.g., the business plan is used by real companies is reached through banking negotiations.

When students are given tasks, they often question the meaningfulness of the work. If, however, when the task is given the students are informed that the artifact, which is the product of the

task given to them, will be used in a "real world" situation, their attitude towards the task is, in our experience, more positive. Providing a possibility to "test" putting the produced artifacts in use is especially important in multi-disciplinary groups, because, for a number of students the issues that are covered during the project are new, and the project will, most likely, be the only time during their studies they are confronted with the studied issues. Therefore, if the artifacts and theory are not put into use, it is less likely that the gained understanding will stick.

When the students, in groups and individually, experience, e.g., banking negotiations, where a representative from a local bank examines the group's business plan and budget, and comments on them, they learn the importance of the documents and understand concretely one example of what these documents are used for. Similarly, when students put their marketing and business fair plans into action, in the PE business fair, and test their skills at selling their products, in their mother tongue, and in English, they can see how marketing is a part of the operations of a company, and how sales ability is one of the cornerstones of any product oriented company.

Putting theory and the prepared artifacts into action enhances learning in multi-disciplinary groups.

5. Summary and conclusions

Recently entrepreneurship education in European higher level educational institutions has increased. This is also true in Finland. Some fields of study in entrepreneurship education are shortly presented. Focus in this paper is put on teaching multi-discipline student groups. As entrepreneurs are not a homogenous group of individuals, but represent different disciplines, it is our opinion that also entrepreneurship education should be given to students from different curriculums.

This paper is based on a practice enterprise project that has been active at the Turku University of Applied Sciences, Salo unit, for some six years. A presentation was given on the PE project that started in October 2005 and ended in May 2006. Information was collected from 122 students, starting the PE project, and some preliminary statistics were presented. Over 61% of the students indicated interest in entrepreneurship and over 94% of them indicated having work

experience. Almost half (47,5%) of the students indicated that there is entrepreneurship in their family (or close relatives).

This paper has presented four lessons learned from a practice enterprise project. These lessons are indicative and reflect the authors' experiences. i) Creating an understanding about the importance and usefulness of the project for the students of different curriculums is a key issue in creating motivation in multi-disciplinary practice enterprise groups. ii) Background companies give students a way to relate their own actions to reality. Visiting the company gives a face to learning about entrepreneurship. The issues that are covered during the project can be related to the background company and hence more easily understood. iii) Placing responsibility of the project to the multi-disciplinary student groups the students learn to manage and plan work, to work in groups, understand the importance of rules and following them, and experience uncertainty and pressure. iiiii) Putting theory and prepared artifacts into action enhances learning in multi-disciplinary student groups. As students know that their work is not just for show, they seem to put more effort into it.

The findings in this paper cannot be generalized to other entrepreneurship education courses. We, however, feel that the paper can give useful hints and information to those designing practice oriented learning-by-doing centered courses on entrepreneurship education.

6. Acknowledgements

The authors would like to acknowledge the support from the EU Interreg IIIA and Länsi-Suomen Lääninhallitus funded From SEM to SME - project. The authors would also like to acknowledge and thank for the help of the group of PE background companies from the Salo area, as well as, the help of the local banks and other institutions that provide the practice enterprise project with the necessary contact to real business life.

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