

KATRIN SAKS

Supporting Students' Self-Regulation and  
Language Learning Strategies in the  
Blended Course of Professional English





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## LIST OF ABBREVIATIONS

CFA	–	Confirmatory factor analysis
CLT	–	Communicative language teaching
DBR	–	Design-based research
EFA	–	Exploratory factor analysis
EFL	–	English as a foreign language
Est-SILL	–	Estonian version of Strategies Inventory for Language Learning
LLS	–	Language learning strategies
LMS	–	Learning Management System (in this study: Moodle)
MSLQ	–	Motivated Scale for Learning Questionnaire
PLE	–	Personal Learning Environment
SEM	–	Structural equation modelling
SILL	–	Strategy Inventory for Language Learning
SRL	–	Self-regulated learning
SRL-SRS	–	Self-Regulated Learning Self-Report Scale
SSRL	–	Socially shared regulation of learning
URL	–	Uniform Resource Locator, global address of documents in the World Wide Web

## LIST OF ORIGINAL PUBLICATIONS

- I **Saks, K.**, Leijen, Ä., Õun, K., Täht, K. (2015). Factorial structure of SILL revisited: adaptation of SILL for Estonian EFL learners. *Eesti Rakenduslingvistika Ühingu aastaraamat*, 11, 241–261.
- II **Saks, K.**, Leijen, Ä., Täht, K. (2016). Inglise keele kui võõrkeele õppijate õpistrateegiad ja nende mõju õpitulemustele. *Eesti Haridusteaduste Ajakiri*, 4(1), 279–308.
- III **Saks, K.**, Leijen, Ä. (2014). Developing language learning strategies in a personal learning environment: Pilot study. In E. Popescu, R. W. H. Lau, K. Pata, H. Leung & M. Laanpere (Eds). *Advances in Web-Based Learning – ICWL 2014*, 66–76. Springer.
- IV **Saks, K.**, Leijen, Ä. (2015). Kognitiivsete ja metakognitiivsete õpistrateegiade toetamine tehnoloogiaga tõhustatud keeleõppes. *Eesti Haridusteaduste Ajakiri*, 3(2), 130–155.  
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### Author contributions:

- Article I: Designing the study, formulating the research questions, arranging the translating process and evaluating the translations of SILL, carrying out the data collection and analysis, and writing the paper as the main author.
- Article II: Designing the study, formulating the research questions, carrying out the data collection and analysis, and writing the paper as the main author.
- Article III: Designing the study, formulating the research questions, arranging the translating process and evaluating the translations of MSLQ, designing and implementing the intervention, designing the learning environment, carrying out the data collection and analysis, and writing the paper as the main author.
- Article IV: Designing the study, formulating the research questions, arranging the translating process and evaluating the translations of SRL-SRS, improving and changing the intervention, changing the learning environment, carrying out the data collection and analysis, and writing the paper as the main author.

# 1. INTRODUCTION

Major changes in today's world and the global labour market assume that working-age people are able to gain new professional knowledge and skills, proficient language and ICT skills but first and foremost, will and capability to learn and retrain. To be able to refresh professional knowledge throughout one's life and gain new knowledge, efficient learning skills and strategies are needed. Yet, acquiring self-directed learning strategies which support learner's goal setting, planning and monitoring his/her activities and assessing the progress, become even more crucial when developing one's career. According to the contemporary approach to learning documented in Estonian Lifelong Learning Strategy 2020 (2014), one of the most essential aims is supporting learner's social and individual development and the application of the approach developing learning skills. To become a successful life-long learner, a primary presumption of developing self-directedness is acquiring self-regulated learning strategies. The use of appropriate learning strategies improves proficiency and achievement, and enables students to take ownership of their own learning by enhancing learner autonomy, independence and self-direction (Wong, 2011).

The scope of the study is language learning in tertiary level. Even though learning English as a foreign language is popular with Estonian students, and the results of English state exams have been relatively high throughout the years (Kriisa, 2014), Estonians often face difficulties when communicating in English. Successful use of language assumes conscious implementation of advanced language learning strategies. But acquisition of good language skills and implementation of suitable learning strategies presume, among other things, learner's capability to regulate his learning activities. Conscious support of metacognitive learning strategies has not been in the focus in Estonian schools because quite frequently teachers are not aware of the necessity and possibilities of supporting learners' self-regulation.

The current research investigates the possibilities of supporting learners' strategy use in the domain of Professional English. The language studies in Estonian schools and universities proceed from the approach of communicative language teaching (CLT). Started as a response to grammar-translation method, CLT became a dominant language teaching approach in the 1970s (Farooq, 2015). However, in Estonian education system it was first introduced in the early 1990s. The greatest value of the approach lies in the shift from drill-based language tasks to communicative-based activities and support of learners' communicative competence and natural growth of language ability (Ibid).

Even though the importance of self-regulation is widely recognised, it has also been admitted that this is one of the most complicated skills to teach and learn (Corno & Randi, 1999). Changing and developing one's learning habits is a slow process, and far too often the newly acquired skills do not evolve transferable. Therefore, it is most efficient to support learners' metacognitive learning strategies in the course that combines several disciplines: professional

tourism-related disciplines and language studies in the current case. This enables learners to implement and demonstrate their knowledge and skills (language skills incl) when solving tourism-related problems.

This study sets out to extend our understanding of effective enhancement of learner's self-regulation and language learning strategies (LLS). In the current study metacognitive learning strategies were supported to improve learners' self-regulation, and cognitive strategies were supported to improve their language learning.

## 1.1 Focus of the research

The dissertation consists of two parts. Part I (Study I and Study II) focused on investigating the factor structure of language learning strategies. In Study 1, the alternative factor structures of the instrument of language learning strategies, SILL (Oxford, 1990) were investigated. In Study 2, a sound and valid instrument, Est-SILL was created on the basis of Oxford's SILL, its reliability and predictive validity were checked, and the direct and indirect effects of language learning strategies on learning outcomes were tested.

Part II (Study III and Study IV) is a design-based research that investigated the efficiency of supporting the use of cognitive and metacognitive learning strategies in the blended course of Professional English.

In addressing the issues in education associated with this study, the **research goals** are:

1. to compile and validate the instrument for measuring Estonian EFL (English as a foreign language) learners' language learning strategies;
2. to design and test the intervention to support learners' language learning strategies and self-regulation.

Based on the goals, the following **research questions** were posed:

1. Which factor structure does SILL (Strategy Inventory for Language Learning), translated and adapted for Estonian EFL learners, reflect?
2. How is the use of language learning strategies related to the learning outcomes in language studies?
3. Which design principles are important for developing the intervention that supports students' language learning strategy use and self-regulated learning strategies in the domain of language studies?
4. How do the learners' use of language learning strategies, self-regulation and content knowledge change as a result of the interventions embedding the support of cognitive and metacognitive strategies?
5. How did learners perceive the learning process and the development of their language skills and self-regulation as a result of the developed interventions?

The research questions are addressed in the following original publications:

**Article I** explores the research question 1, and investigates the 2-, 6- and 9-fold structures based on original SILL.

**Article II** addresses the research questions 1 and 2, and continues searching for the most appropriate factor structure drawn of theoretical frameworks of Oxford (1990), Cohen (1996), and O'Malley and Chamot (1990).

**Articles III and IV** cover the research questions 3, 4 and 5, and investigate the design principles for developing the intervention to support learners' LLS use and self-regulated learning (SRL). While **Articles III** describes the initial process of creating the intervention and measuring the changes in learners' strategy use and content knowledge, **Article IV** investigates the ways of enhancing the intervention to support students' strategy acquisition even further. Throughout the Phase 1 (described in **Article III**) and Phase 2 (**Article IV**) of the design-based research, the learners' perceptions of the learning process, designed learning assignments and support of strategy use were investigated. The current dissertation gives an overview and results of the studies reported in Articles I–IV.

## 2. REVIEW OF LITERATURE

### 2.1 Language learning strategies

English language skills are a self-evident requirement in today's globalised world. Although the acquisition of English as a foreign language may not necessarily be any easier than decades ago, it cannot be denied that there is now a much wider range of resources and methods available to learners, thanks to global communication and media (Ariza, 2002; Ellis, 2013; Jiamu & Chantou, 1997). Given this, learning strategies are all the more important as these arguably help learners exploit available resources with greater efficiency and promote learner autonomy, independence and self-direction (Wong, 2011).

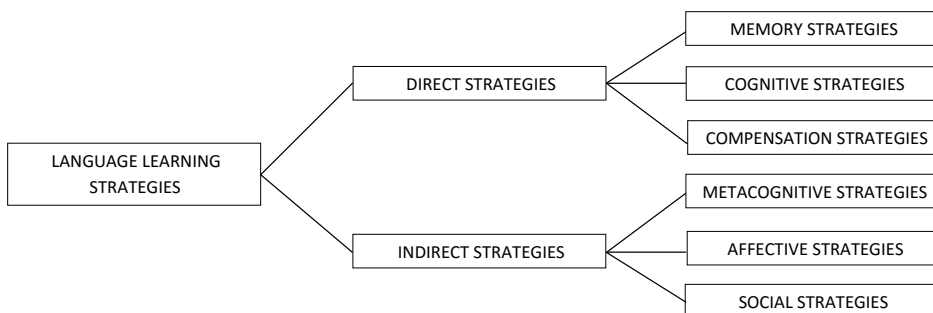
The term *strategies* is used to refer to general approaches as well as to specific actions or techniques (Cohen, 1996). In the learning context, the strategies which support active, conscious, purposeful and attentive learning, greater proficiency, learner autonomy and self-regulation, are primarily promoted (Hsiao & Oxford, 2002).

Language learning strategies are believed to play a vital role as they assist learners in mastering the forms and functions required for reception and production in the foreign language and thus affect achievement (see e.g. Bialystok, 1979; Douglas, 2001). According to Oxford (1990), conscious and efficient use of language learning strategies supports learners to become more self-directed, and problem-oriented. It includes specific actions taken by the learner, involving many aspects of the learner, not just cognitive, supporting learning both directly and indirectly, being not always observable, but conscious, possible to be taught, flexible, and influenced by a variety of factors (Ibid). The use of appropriate language learning strategies improves proficiency and achievement and, at the same time, enables students to take charge of their own learning by enhancing self-direction (Wong, 2011).

Language learning strategies research has gone through the development from simple lists of strategies based on observation and intuition, to much more sophisticated investigations using diaries, surveys and studies on LLS training (Oxford & Crookall, 1989). Several researchers have produced different classifications of strategies (Rubin, 1975; Stern, 1975; O'Malley & Chamot, 1990), giving their input to the six-strategy taxonomy that Oxford designed (1990).

#### 2.1.1 Classification of language learning strategies according to Oxford. Measuring strategies with SILL

Oxford divided language learning strategies into two main groups of direct and indirect strategies, and six subgroups according to the results of early factor analysis (Oxford & Burry-Stock, 1995). These are memory, cognitive and compensation strategies (as direct strategies), and metacognitive, affective and social strategies (as indirect ones) (Figure 1).



**Figure 1.** The division of language learning strategies according to Oxford (1990)

Direct strategies such as reviewing and practising, involve direct learning and use of the subject matter, in the current case a new language. Indirect strategies such as planning, cooperating and seeking opportunities, contribute indirectly but powerfully to the learning process (Oxford, 1990). The indirect strategies can also be used to assess the degree to which students report them having control of their own learning activities (Benson, 2011). Direct and indirect strategies both include three subgroups: memory, cognitive, compensation, metacognitive, affective and social strategies.

**Memory** strategies aid in entering information into long-term memory and retrieving information when needed for communication. Learners' activities when using memory strategies involve creating mental images, applying images and sounds, and creating connections to memorise new information. The use of memory strategies diminishes when the learner becomes more proficient. **Cognitive** strategies are used for forming and revising internal mental modes, and receiving and producing messages in the target language. Learners' activities are practising, receiving and sending messages, analysing and reasoning, and creating structures for input and output. **Compensation** strategies which involve making intelligent guesses and overcoming limitations in speaking and writing, are used when gaps in knowledge of the language are needed to overcome. **Metacognitive** strategies help learners exercise executive control in planning, arranging, focusing, and evaluating their own learning process. **Affective** strategies enable learners to control their feelings, motivation and attitudes related to language learning, and the activities involve lowering anxiety and encouraging. The use of affective strategies also diminishes when the learner becomes more proficient and confident about his/her language skills. And finally, **social** strategies, e.g asking questions, cooperating and empathising with peers, facilitate interaction with peer learners, often in a discourse situation (Oxford, 1990). Having a large overlap among strategies, they interact and mutually support each other (Ibid). According to Jones (1998), Oxford's classification of language learning strategies is believed to be more comprehensive and detailed than earlier classification models by her predecessors, and they are all oriented toward the goal of communicative competence.

The use of language learning strategies may be measured using different methods, from observation or interviews to diaries and think-aloud protocols. Student-completed, summative rating scales have been reported to be the most time-saving and cost-effective measurement. Moreover, being self-scoring, they enable students to discover a great deal about themselves, giving valuable feedback about their learning habits (Oxford & Burry-Stock, 1995).

The most widely used and analysed instrument in the domain of foreign language acquisition is the self-report questionnaire Strategy Inventory for Language Learning (SILL). It has been translated into more than 20 languages and been validated by many researchers. SILL is considered to be a useful instrument as it has clearly indicated the relationship between strategy use and language performance, giving reasons for the belief that enhancing strategy use could improve language performance (Oxford & Burry-Stock, 1995). The psychometric characteristics of SILL have been widely explored and tested (Alhaisoni, 2012; Ehrman & Oxford, 1989; Fazeli, 2012; Green & Oxford, 1995; Griffiths, 2003; Tragant et al, 2013; Wong, 2011). Green and Oxford (1995) quote the reliability of the subscales of SILL using Cronbach's alpha for internal consistency as 0.68–0.80 (Tragant et al, 2013). The reliability coefficients were slightly lower when not being administered in the native language of the respondents but in English (Oxford & Burry-Stock, 1995). The lower reliability was caused by measurement errors due to the language effect (Oxford & Burry-Stock, 1995).

It has been stated that the factors of SILL are correlated rather than orthogonal (Hsiao & Oxford, 2002; Park, 2011). Particular strategies could be viewed as related to more than one category (Oxford, 1990) with the categories mutually supporting each other (Oxford, 1990; Hsiao & Oxford, 2002). Hsiao and Oxford (2002) believe that there will probably never be a strategy taxonomy in which intercorrelations among particular strategies are totally eliminated, because such a taxonomy would not reflect reality. However, this partial overlapping and strong intercorrelation are considered to be the main reason why the factors do not obtain clear outlines (Park, 2011).

In order to validate SILL's underlying structure, confirmatory factor analysis (CFA) was used for the investigation of the hypothesized measurement structures of scales by Hsiao and Oxford (2002). The results showed that the 6-factor strategy taxonomy was most consistent with learners' strategy use. However, the authors admitted that the model did not produce "a fully acceptable fit to the data" and that the format and structure of the whole instrument should be further revised (Hsiao & Oxford, 2002). Several researchers question the reliability of the instrument as no valid evidence has been found to support the six-fold classification of language learning strategies in the form of subclass reliabilities (Article I\*; Park, 2011; Rose, 2012; Woodrow, 2005). Different factor structures, nine-factor structures among them (Article I; Oxford & Burry-

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\* Saks, K., Leijen, Ä., Õun K. (2015). Factorial structure of SILL revisited: adaptation of SILL for Estonian EFL learners. *Eesti Rakenduslingvistika Ühingu aastaraamat*, 11, 241–261.



Stock, 1995), have been found in the studies with Puerto Rican, Taiwanese, Japanese, Egyptian, Chinese, American and Estonian learners. According to Park (2011), the popularly used two-construct and six-construct classification systems of SILL do not fit the data and the classification systems should be reinvestigated to better understand the structures of SILL. Therefore, it is important to conduct more studies to clarify the most suitable factor model for SILL. This research could also help to understand the nature of language learning strategies and decide which classification system accounts best for them.

Due to its widespread use in almost all continents and different cultures it provides good material for comparison, which may finally result in its reinvestigation and restructuring into an even more reliable instrument. Drawn on the validity issues the previous studies of SILL have revealed, it is highly important to investigate its factor structure and validity before employing the instrument in the study. Therefore, the first part of the current research (Study 1 and Study 2) focuses on validating SILL, its factor structure, predictive validity, and direct and indirect effects of the strategies on learning outcomes.

### **2.1.2 Alternative classifications of language learning strategies**

Even though Oxford's classification is widely recognised and the measurement instrument SILL, which is based on her taxonomy, is widely used, the researchers are still constantly looking for new and better-fitting structures to describe language learning strategies. Cohen (1996) distinguished two subdivisions for foreign language strategies: language *learning* strategies and language *use* strategies. Used together, they constitute the activities the learner selects to improve his/her learning of a second language, the use of it, or both. While language learning strategies assist learners in improving their knowledge, language use strategies, encompassing language *performance* strategies and *communication* strategies, focus on employing the language that learners have in their current inter-language (Cohen, 1996). While learning strategies include activities for identifying the material that needs to be learned, language use strategies refer to using the material involving at least four subsets of strategies: retrieval, rehearsal, coping and communication. Similarly to Chamot (1987, as cited in Cohen, 1996) and Oxford (1990), Cohen further differentiates language learning strategies and language use strategies as cognitive, metacognitive, affective and social. However, this distinction may not be sufficient, either, as several strategies may be interpreted as belonging to cognitive and metacognitive strategy groups concurrently (Cohen, 1996).

Another way of classifying language learning strategies is according to function. O'Malley and Chamot (1990), proceeding from cognitive learning theory, presented three main strategy groups – cognitive, metacognitive and socio-affective strategies. They describe *cognitive* strategies as the ones in which the learner interacts with the material by manipulating it mentally or

physically; *metacognitive* strategies that involve executive processes in planning, monitoring and evaluating how well the learning objectives have been achieved; and *socio-affective* strategies in which the learner interacts with a peer in order to assist learning or uses some kind of affective control to assist learning (O'Malley & Chamot, 1990). The content of their subdivisions is quite similar to those in Oxford's classification. However, in their division O'Malley and Chamot go deeper and distinguish the strategies in a more detailed manner. And yet, this division is not distinctive, either, because the strategies may belong to several strategy groups at a time.

Despite different approaches to classifying strategies, they all still have extensive overlappings and intercorrelations which causes difficulties classifying and measuring them. Subsequently, an overview of measuring language learning strategies will be given.

## **2.2 The relations of language learning strategies and learning outcomes**

Although the language learning strategies have been researched a lot, there is no common understanding of the relations between the learner's use of LLS and his/her success in the situation of using the language, and how the results of his/her language test reflect the strategy use. The efficiency of language studies is usually assessed with tests. The assessment of the efficiency of learning is usually expressed numerically in the form of a score. Progress in studies that can be measured with tests are influenced by two kinds of strategies: learning strategies and test-taking strategies (Cohen, 2006).

Even though it has been shown that strategy use and academic advancement are related, these relations are very complex, they are difficult to comprehend and describe (Wesche, 1987). One of its reasons is the multidimensional nature of the construct and interactions of the variables (Chamot et al, 1988). Also, the fact that more complicated learning assignments assume a simultaneous use of several different learning strategies and activating different mental processes (Dansereau, 1985). Metacognition is said to play an important role in the process of language learning (Chamot, 2005; Victori & Lockhart, 1995). But how are metacognitive learning strategies related to cognitive ones, and how they contribute to learning outcomes, is not unambiguously understood (Zhang et al, 2014). Purpura (1997) who studied the relations of cognitive and metacognitive learning strategies and the results of reading tests found that cognitive strategies did not affect reading efficiency directly but through vocabulary-grammar skills. Memory strategies were reported to be directly and negatively related to vocabulary-grammar skills which refers to the possibility that using memory strategies in a tense test-taking situation might deteriorate the test results. Metacognitive learning strategies were not found to be directly related to test results. However, they were related directly and positively to the use of cognitive strategies affecting the test results indirectly through cognitive ones

(Purpura, 1997). A similar relation between cognitive and metacognitive strategies was also shown by Phakiti (2003). Bachman and Palmer (2010) showed that the learner's use of metacognitive strategies determines how well the language ability can be realised in language use. Language ability is conceptualised as the combination of learner's language knowledge and strategic skills or metacognitive skills (Bachmann & Palmer, 2010). Flavell (1979) also noted that metacognition has an important role when performing many cognitive activities in language learning, language use, and test-taking situations. All studies mentioned above had been conducted to measure language learners' reading and vocabulary-grammar competencies which are related to each other. Whether that kind of relations of learning strategies can be expanded to other language competencies is the scope of Study II.

### 2.3 Self-regulation

The recent trends to improve learners' awareness of their learning styles and learning strategies goes hand in hand with the trend towards more self-regulated learning and learner autonomy (Jones, 1998). Independent and efficient use of learning strategies encourages greater self-direction for learners. It is especially important when a big part of learning takes place outside the traditional classroom (Oxford, 1990), in web-based learning environments, at the workplace or in real-life situations. Teaching new strategies may not lead to improved proficiency when learners are not ready to take control over their learning process and outcomes. Metacognitive learning strategies which are included in almost all strategy classifications, are of vital importance in the context of language learning (Chamot, 2005; Victori & Lockhart, 1995). However, their role and intercorrelations with other strategies have not been clearly defined. To assess the learners' use of metacognitive strategies and the level of their self-regulation in general, it is important to understand the construct, its components and their interactions.

The term *metacognition* was defined in the late 1970s by developmental and cognitive psychologists (Flavell, 1979). First, most of the research at that time focused on students' metacognitive knowledge of different types of memory and cognitive strategies, and later on the issues of control and regulation of cognition (Brown et al, 1983, as cited in Pintrich et al, 2000a). The construct of self-regulated learning was proposed by educational and developmental psychologists only in the 1980s and 1990s. The term *self-regulated learning* was used to refer to the various ways individuals monitor, control and regulate their learning (Schunk & Zimmerman, 1994). Most of the models of self-regulated learning assume that the processes of monitoring, controlling and regulating are related to metacognitive knowledge about the self and cognition (Garcia & Pintrich, 1994). So, self-regulated learning is the more general and inclusive construct encompassing both metacognition and metacognitive knowledge (Pintrich et al, 2000a).

The high relevance of self-regulated learning suggests that the term is precisely defined and used. Many similar terms like self-directed learning, autonomous learning, self-planned learning, self teaching and independent study are used in the same meaning and context, and the differences between them are often subtle and inconsistent which has caused interchangeable use (see also Saks & Leijen, 2014). The current research draws on the general cognitive view of motivation and learning strategies, and the definition of Pintrich (2000) according to which self-regulated learning is an active, constructive process where learners set goals for their learning, monitor, regulate and control their cognition, motivation and behaviour, guided and constrained by their goals and contextual features on the environment.

There are several theories of self-regulated learning and numerous definitions which are important to understand the issues in this context. One of the initial, fundamental definitions comes from Bandura (1986), who incorporating it into his social cognitive theory of human behaviour, viewed *self-regulation* as the process of influencing the external environment by engaging in the functions of self-observation, self-judgment and self-reaction. It also encompassed the self-efficacy mechanism which had a strong impact on thought, affect, motivation and action. Drawing on his works, Zimmerman (1986) defined *self-regulated learning* as the process where students activate and sustain cognitions and behaviours systematically oriented toward the attainment of their learning goals. He also came out with a three-phase cyclical model: forethought phase with task analysis and self-motivation beliefs; performance phase (sometimes also called volitional control) with self-control and self-observation; and self-reflection phase with self-judgment and self-reactions (Zimmerman & Moylan, 2009). Winne (1996) accents the metacognitive perspective defining *self-regulated learning* as a metacognitively-guided behaviour where learners regulate their use of cognitive tactics and strategies, and is at least partly intrinsically motivated. Winne and Hadwin (1998) saw self-regulation as four flexibly sequenced and recursive phases of defining the task, setting goals and plans, engagement and large-scale adaptation. Boekaerts (1997) defined *self-regulated learning* as a complex interaction between (meta)cognitive and motivational regulation. In her model that consisted of six components she differentiated both regulation systems in relation to three levels (goals, knowledge, and cognitive strategies).

What most of the theories agree is that self-regulated learning is a constructive process whereby students regulate different cognitive, metacognitive, motivational, volitional and behavioural processes during their learning (Winters et al, 2008). There is a variety of perspectives on self-regulated learning which incorporate individual SRL, co-regulation and socially shared regulation of learning (SSRL) (Hadwin et al, 2000). Researchers with different foci attempt to model how cognitive, meta-cognitive, motivational, and contextual factors influence the learning process (e.g Boekaerts, Pintrich, Zimmerman). Subsequently, Pintrich's framework based on Zimmerman's cyclical three-phase model and four assumptions will be explained. This framework with its

complete and comprehensive model was chosen for the basis of the current research as it enables to describe a very complex concept of self-regulated learning from the most diverse perspectives.

Pintrich's general framework for theory and research lies on four assumptions: active, constructive assumption; potential for control assumption; goal, criterion or standard assumption; and finally, mediators between personal and contextual characteristics and actual achievement or performance (2000). In his model Pintrich described the regulation of a learning process in four areas: cognition, motivation and affect, behaviour, and context. In these areas he distinguished four phases: forethought and planning, monitoring, control and reflection that can be applied to all four domains (Table 1). Regulation is the keyword which covers all phases and areas (Pintrich, 2004). Although the learners go through the four phases as they perform a task, it does not mean that the phases are hierarchically or linearly structured. The phases can also occur simultaneously and dynamically according to how the learner progresses (Ibid). This simultaneous occurrence may also be the reason why it is difficult to reliably distinguish among the phases with measurement instruments, and this in turn may make it difficult to distinguish the factors in the instrument.

In order to comprehend learners' self-regulation, it is necessary to observe what is happening during the learning process. That is why researchers are still looking for more reliable theories and designing more elaborate models to comprehend learners' self-regulation. Toering and her colleagues (2012), drawing on Zimmerman's framework, attempted to investigate self-regulation of learning as a relatively stable attribute of an individual. In their model they separated the three main self-regulative activities – planning, self-monitoring and evaluating. This differentiation enables to study the learning process in more detail and reach a better comprehension. Self-regulated learners want to improve and in order to reach this goal, they must be able to diagnose which aspects of their skills or knowledge need improvement and how this can be accomplished. It has been suggested that individuals who self-regulate, plan how to approach a task in advance of their actions, self-monitor their improvement during task performance, evaluate the process and outcomes, and during planning, self-monitoring and evaluation, reflect upon the learning process (Ertmer & Newby, 1996, as cited in Toering et al, 2012). Besides knowing what aspects and how to improve, self-regulated learners must be motivated to improve (Zimmerman, 1989). Earlier research revealed that motivational outcome variables (i.e effort) and motivational beliefs (i.e self-efficacy) were positively linked to cognitive and metacognitive strategy use (Pintrich & Schunk, 2002). These relations were the reason why effort and self-efficacy were included as the motivational variables of self-regulation of learning in Toering's (2012) model in addition to planning, self-monitoring, evaluating and reflection.

**Table 1.** Phases and areas for self-regulated learning (Pintrich, 2004)

<i>Phases</i>	Cognition	Motivation/Affect	Behaviour	Context
<i>Phase 1</i>	Target goal setting	Goal orientation adoption	Time and effort planning	Perceptions of task
Forethought, planning and activation	Prior content knowledge activation Metacognitive knowledge activation	Efficacy judgement  Perceptions of task difficulty  Task value activation Interest activation	Planning for self-observations of behaviour	Perceptions of context
<i>Phase 2</i>	Metacognitive awareness and monitoring of cognition Target goal setting	Awareness and monitoring of motivation and affect  Goal orientation adoption	Awareness and monitoring of effort, time, need for help Time and effort planning Self-observation of behaviour	Monitoring changing task and context conditions Perceptions of task
<i>Phase 3</i>	Selection and adaptation of cognitive strategies for learning, thinking	Selection and adaptation of strategies for managing, motivation and affect Task value activation	Increase / decrease effort  Persist, give up help-seeking behaviour	Change or renegotiate task  Change or leave context
<i>Phase 4</i>	Cognitive judgements	Affective reactions Task value activation	Choice behaviour	Evaluation of task Evaluation of context
Reaction and reflection	Rehearsal	Intrinsic goals	Effort regulation	Peer learning
Relevant MSLQ scales	Elaboration	Extrinsic goals	Help seeking	Time/study environment
	Organisation	Task value	Time/study environment	
	Critical thinking Metacognitive self-regulation	Control beliefs Self-efficacy  Test anxiety		

Motivation and learning strategies, metacognitive strategies among them, are not static traits but dynamic and contextually bound (Duncan & McKeachie, 2005). They are gradually growing as learners become more aware and confident about their learning and responsibility. This makes observing and measuring their improvement interesting and challenging. The following chapter gives an overview of different perspectives of measuring learners' self-regulation and measuring instruments.

### **2.3.1 Measuring self-regulation, MSLQ and SRL-SRS**

Self-regulated learning has been reported to have the properties of an aptitude and an event (Winne, 1997). An *aptitude* describes a relatively constant attribute of a person that predicts his future behaviour. An *event* has been described by Winne and Perry „like a snapshot that freezes activity in motion, a transient state embedded in a larger, longer series of states unfolding over time“ (2000).

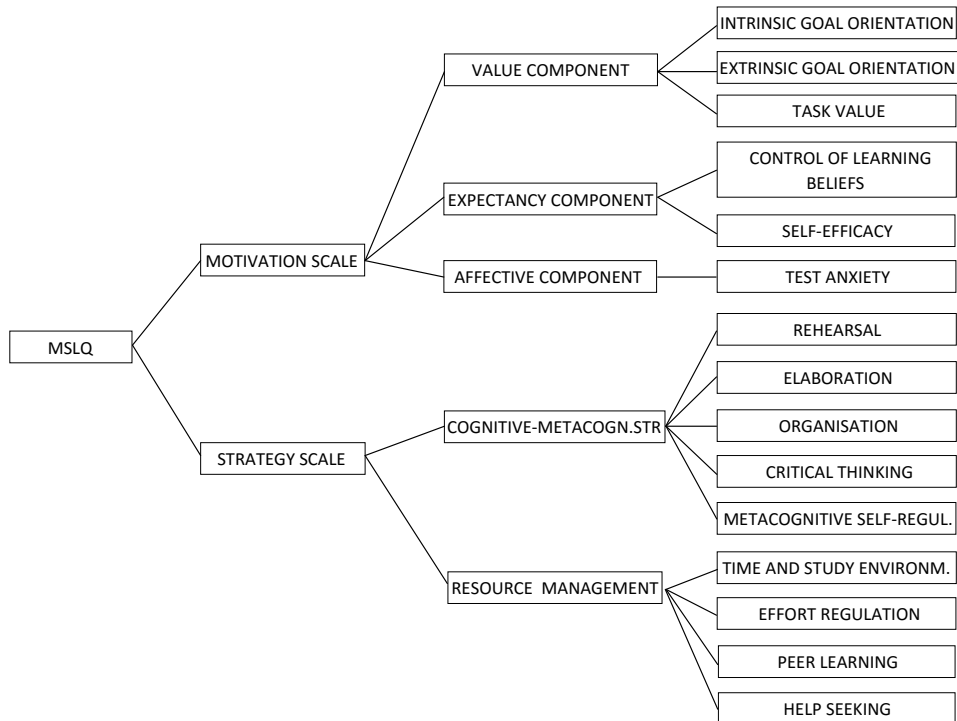
When self-regulated learning is measured as an aptitude, a single measurement resumes the quality of self-regulated learning which is based on multiple self-regulated learning events. Measurements of self-regulated learning as aptitude can be used to predict whether a student is able to act on a cognition related to self-regulated learning. In this sense, a measurement of self-regulated learning as aptitude can stand alone, independent of other measurements (Winne & Perry, 2000). The most common protocols for measuring self-regulated learning as an aptitude include questionnaires, structured interviews and teacher judgements (Zimmerman & Martinez-Pons, 1988). When measured as an aptitude, self-regulated learning varies within individuals over relatively long time periods, within individuals across different tasks and settings, and across individuals (Winne, 1996, as cited in Winne & Perry, 2000).

An event is observed over time from a prior event to subsequent. Self-regulated learning measured as an event has three successively more complex levels: occurrence, contingency, and patterned contingency (Winne & Perry, 2000). The most reliable ways to assess self-regulated learning as an event are think-aloud protocols, error detection tasks, trace methodologies and observations of performance (Ibid).

In the current research we draw on self-regulated learning as an aptitude aiming to investigate its varying within individuals over the 4-month period, and across the intervention of four different learning assignments. Despite the validity problems which are frequently attributed to self-reports, the most common measurements for self-regulated learning as an aptitude are still self-report questionnaires. On the one hand, these are relatively easy to design, administer and score, on the other hand, they provide rich information which is easily interpretable, and they give person's own perspective (Paulhus & Vazire, 2007). The items used in the questionnaire ask respondents to generalise their actions across situations rather than referencing singular and specific learning events while learners experience them (Winne & Perry, 2000). This in turn, may

involve credibility issues attributed to self-reports, such as self-deception and memory. In order to control the self-deception contamination, the demand reduction method (Paulhus & Vazire, 2007) was applied. To reduce demand for socially desirable responses, the learners were reminded before administering the test that the feedback they would get about the survey would be useful only if responses were honest. Respondents were also assured that their grades in the course were not influenced by their responses.

The most widely-used instrument for measuring learners' self-regulated learning strategies is the Motivated Strategies for Learning Questionnaire (MSLQ) by Pintrich and his colleagues (1991). It is an 81-item self-report instrument which was originally designed to assess college students' motivational orientations and their use of different learning strategies. The items are simple declarations (e.g. *I usually study in a place where I can concentrate on my course work.*) or conditional relations (e.g. *When studying for this course, I often try to explain the material to a classmate or friend*). The answers are recorded using a 7-point Likert-type scale where 1 stands for *not at all true of me*, and 7 – *very true of me*. MSLQ consists of motivation scale (31 items) and strategy scale (50 items). The motivation scale has got a value component, expectancy component and affective component. The strategy scale has got two subdivisions: cognitive and metacognitive strategies, and resource management strategies (Figure 2).



**Figure 2.** The division of subscales of MSLQ (based on Pintrich et al, 1991)



The following gives an overview of the subscales as described by Pintrich and his colleagues (1991). Goal orientation refers to the learner's perception of the reasons of being engaged in a learning task. **Intrinsic goal orientation** concerns the learner's perception of participating in a task for e.g challenge, curiosity or mastery. **Extrinsic goal orientation** complements intrinsic and concerns the learner's perception of participating in a task for grades, rewards, evaluation by others, competition and other external factors. While goal orientation refers to the reasons why the learner is participating in the course, **task value** refers to the learner's evaluation of how interesting, important and useful the task is. High task value should lead to bigger involvement in learning. According to Pintrich, task value refers to learners' perceptions of the course material in terms of interest, importance and utility (Ibid). **Control of learning** refers to learners' beliefs that their efforts to learn result in positive outcomes. If a learner feels that he/she can control his/her academic performance, he/she is more likely to use more effort which is necessary strategically for desired changes. The items of **self-efficacy** assess expectancy for success and self-efficacy. The former refers to performance expectations and relates to task performance. The latter is a self-appraisal of the ability to master a task. **Test anxiety** comprises two components: worry or cognitive, and emotionality. The worry component, being the greatest source of decrement, refers to learner's negative thoughts that may disrupt his performance. Emotionality component refers to affective and physiological arousal aspects of anxiety. The items of the strategy scale describe certain activities learners consciously do during the learning process. **Rehearsal strategies** similarly to Oxford's memory strategies (1990) involve reciting and naming items to be learned. While rehearsal strategies are used for simple tasks and activation of information in working memory, **elaboration strategies** (e.g paraphrasing, summarising, creating analogies) are used to store information into long-term memory by building internal connections between items to be learned. Using these strategies enables to integrate and connect new information with prior knowledge. **Organisation strategies** (e.g clustering, outlining) help the learner select appropriate information and construct connections among the information. Using these as active and effortful strategies results in bigger involvement in the task and better performance. **Critical thinking** strategies describe the ways learners apply previous knowledge to new situations while solving problems, making decisions or critical evaluations. The **metacognitive strategies** refer to the control and self-regulation aspects of metacognition covering planning, self-monitoring and regulating processes. The strategies of **time and study management** involve scheduling, planning and time management in the class work settings. **Effort regulation** refers to self-management and commitment to completing study goals despite difficulties or distractions. Effort regulation is considered important to academic success as it signifies goal commitment as well as regulates the strategy use. **Collaborative learning with peers** has a positive effect on learning outcomes and helps to reach new and deeper insights. **Help seeking** strategies refer to asking for and using support from peers and

instructors. Earlier research has revealed that peer help, peer tutoring and individual teacher assistance facilitate achievement (Ibid).

MSLQ has been translated into more than 20 different languages and has undergone formal assessment of validity and reliability in several other languages such as Portuguese (Brown et al, 2001), Spanish (Ramirez-Dorantes et al, 2013), Chinese (Rao & Sachs, 1999; Lee et al, 2010b) and Estonian (Saks et al, 2015b).

Previous research has shown that the internal consistency of MSLQ was estimated relatively good (Pintrich et al, 1991; Pintrich et al, 1993). The majority of the Cronbach's alphas for the individual scales were acceptable, ranging from .52 to .93. The two confirmatory factor analyses which were conducted in the test-period suggested reasonable factor validity (Pintrich et al, 1993). The subscales have shown promising predictive validity for academic performance (Khatib, 2010; Kitsantas et al, 2008; Sachs et al, 2001, Pintrich et al, 1993).

Although Pintrich's framework is very elaborate and describes the system of strategies in detail, his instrument has not always provided satisfactory factor structure or model fit indices (Davenport, 2003; Dunn et al, 2011; Hamilton & Akhter, 2009; Saks et al, 2015b). That is why researchers are still looking for more reliable theories and designing more fit measuring instruments to assess learners' self-regulation.

Toering and her colleagues drew on Zimmerman's framework and designed Self-Regulation of Learning Self-Report Scale (SRL-SRS). Unlike MSLQ where metacognitive self-regulation is assessed as one unitary construct, SRL-SRS distinguishes the three main self-regulative activities – planning, self-monitoring and evaluating (Toering et al, 2012). This differentiation enables to study the learning process in more detail and reach a better comprehension of it.

SRL-SRS contains 50 items and is intended to measure self-regulation as a relatively stable attribute in multiple learning domains, such as sports, music and academic domains. It comprises the subscales of originally English-language questionnaires. The subscales of planning, effort and self-efficacy originate from the self-regulatory inventory and the Generalized Self-efficacy Scale by Hong and O'Neil Jr (2001, as cited in Toering et al, 2012). The self-monitoring subscale was adopted from the Self-Regulation Trait Questionnaire by Herl et al (1999, as cited in Toering et al, 2012). The evaluation items originated from the evaluation subscale of the Inventory of Metacognitive Self-Regulation by Howard et al (2000, as cited in Toering et al, 2012), and the reflection subscale was based on the Reflective Learning Continuum by Peltier et al (2006, as cited in Toering et al, 2012).

The validity studies and confirmatory factor analysis revealed a sound structure of SRL-SRS. The modified six-factor model fitted the data acceptably. Inter-item correlations (ranged between .15 and .59), reliability coefficients (.73 – .85 for subscales) and inter-scale correlations (.34 – .63) showed that the internal consistency of the subscales was sufficient (Toering et al, 2012). Also, the results of relative and absolute test-retest reliability indicated sufficient

temporal stability of the instrument. In conclusion it can be said that SRL-SRS proved to be a reliable instrument to measure self-regulation as a relatively stable attribute (Ibid). From the perspective of the current research, using SRL-SRS by Toering (2012) in addition to MSLQ by Pintrich (2000) gives an added value to comprehend learners' self-regulation. While MSLQ provides a wider and more diverse understanding of learners' motivation and strategy use, SRL-SRS enables to investigate the process of self-regulating in more detail. That is why both measurements were considered to use in the research.

## **2.4 Supporting effective language learning strategies and self-regulation**

Acquiring sufficient learning strategies and self-regulated skills, and reassuring better academic achievements (Dabbagh & Kitsantas, 2005; Schunk & Zimmerman, 1994) is not considered self-evident. These skills have to be instructed and supported throughout the whole learning process. This is a challenge for instructional designers and teachers to develop and apply effective strategies and encourage learners to develop their cognitive and metacognitive learning strategies in the learning process. One of the aims of the current study was to investigate the most effective supports and conditions for scaffolding language learning strategies and self-regulation reported in previous empirical studies. Language learning strategies, comprising basically different cognitive and social strategies which all support communicative competence, are addressed as cognitive strategies in this study. Metacognitive strategies are treated as the learning activities that lead to learner self-regulation. The following is an overview of the studies describing the most efficient interventions.

There are several effective ways to support learners' self-regulation, starting with designing e-learning environments (Liaw & Huang, 2013) and SRL assisted mechanisms in personalised e-learning systems (Chen, 2009) to persuasive mobile textings (Goh et al, 2012) and elaborated training programs (Bannert & Reimann, 2012). Drawn on studies attempting to support self-regulated learning, Bannert identified three principles for effective intervention. First, instruction on self-regulated learning must be integrated with the domain-specific instruction being embedded in the subject matter; second, the application conditions and the usefulness of acquiring self-regulated learning strategies must be explained to students. Otherwise, students may feel disturbed and interrupted, and will not use them. To prevent this it is recommended to model and explain how these conditions support their learning. And third, it is important that sufficient training time is provided in order to internalize and automatize the self-regulated learning strategies and skills (Bannert & Reimann, 2012).

In order to further understand how self-regulated learning is supported, we will consider different scaffolding types suggested by Hannafin and colleagues (1999). First, *conceptual scaffolding* consists of aids that guide students'

understanding of content. It guides learners regarding what to consider. Second, *procedural scaffolding* shows how to utilize available resources and tools orienting to system features and functions. Third, *strategic scaffolding* involves alternative approaches to learning activity supporting analysing, planning, strategy and tactical decisions. Finally, *metacognitive scaffolding* supports the underlying processes associated with individual learning management. It guides students' ways of thinking and reflecting on their task (e.g., training and prompts for self-monitoring and reflection) (Hannafin et al, 1999). Metacognitive scaffolding which was also used to enhance the current intervention guides the ways of thinking in the learning process – how to think about the problem and which strategies to consider. The suggested mechanisms for metacognitive scaffolding are directing learners to plan ahead, determine their needs and evaluate their progress, modelling cognitive strategies and self-regulatory processes (Ibid).

Earlier researches, which have tested different combinations of scaffolds, have provided evidence that the most efficient support for learner's self-regulation is metacognitive scaffolding combined with cognitive. Good results have been reported in the empirical studies where prompts were combined with learning protocols (Berthold et al, 2007), cognitive writing strategies and self-regulated strategies (Brunstein & Glaser, 2011), generative learning strategies and metacognitive feedback (Lee et al, 2010a), and self-questioning model IMPROVE (Kramarski & Michalsky, 2009, 2010; Kramarski & Gutman, 2006). These studies suggested that prompting stimulated the use of cognitive and metacognitive strategies. Metacognitive scaffolding enabled to enhance several aspects of self-regulation, including monitoring, strategy use and motivation. It also appeared that better academic gains were achieved in these groups where cognitive strategies were supported in combination with metacognitive ones. Therefore, it can be suggested that cognitive and metacognitive learning strategies are not independent but they complement each other; metacognitive strategies control and regulate the use of cognitive strategies.

Drawing on the theoretical frameworks outlined above, a model was designed to support learners' cognitive language learning strategies and metacognitive learning strategies to enhance learners' self-regulation. The model comprising four learning assignments, provided with prompts and applied in the Tourism English course will be described in detail in Chapter 3.2.3.3 and Chapter 3.2.4.2.

### 3. RESEARCH METHODOLOGY

The current dissertation consists of two parts (Table 2). Part I (Studies I and II) focuses on adapting and validating the self-report questionnaire SILL that enables to measure the use of EFL learners' language learning strategies. Study I proceeded from the theoretical framework of Oxford (1990). The factor structure was explored based on Oxford's two- and six-fold divisions. An option of a nine-factor division published in several international studies (Oxford & Burry-Stock, 1995) was also explored and tested (Article I). In Study II, the theories of Cohen's (1996) and O'Malley and Chamot's (1990) were also considered in addition to Oxford's, and a sound factor structure was looked for to explain the students' strategy use. The construct validity of the instrument was estimated throughout the studies considering the results of factor analysis, comparing the results with another instrument and manipulating the construct experimentally. Construct validity is considered the most important and precise validity as it estimates what the test or instrument actually measures (Fraenkeln et al, 2009; Gay et al, 2006). Also, in Study II the predictive validity of the measurement scale was tested and the direct and indirect effects of LLS on learning outcomes were measured (Article II). The reliable and valid questionnaire was necessary for measuring learners' use of cognitive and metacognitive learning strategies in the following studies.

Part II that also consists of two studies (Study III and Study IV) used a design-based methodology and described the developing process of the learning environment and intervention which aimed to support learners' use of cognitive and metacognitive learning strategies. Study III, which made Phase 1 of the design experiment, focused on creating the intervention with 4 learning assignments to support learners' cognitive and metacognitive strategies (Articles III), while Study IV (Phase 2) focused on revising the learning environment and enhancing the intervention with prompts (Article IV). In the current dissertation Study III is addressed as Phase 1 and Study IV as Phase 2 according to the principles of design-based methodology (Collins et al, 2004).

**Table 2.** Overview of the studies from the methodological point of view

	Study	Focus of the study	Sample	Data collection	Data analysis
Part I – Language Learning Strategies	Study I	Exploration of the factor structure of SILL	337 students (tertiary level)	SILL	EFA, CFA
	Study II	Exploration and confirmation of the factor structure of SILL, validating, effects of LLS on learning outcomes	267 students (secondary level)	SILL English state exam	EFA, CFA, correlation analysis, SEM
Part II – Supporting cognitive and metacognitive strategies	Study III	Design-based study Phase 1 Creating a learning environment and testing the intervention to support learners' cognitive and metacognitive learning strategies	28 students (tertiary level, domain: Tourism English)	Est-SILL MSLQ Content test Semi-structured interviews	t-test (Bonferroni correction), correlation analysis, thematic analysis
	Study IV	Design-based study Phase 2 Enhancing and testing the effectiveness of intervention, elaborated and complemented with prompts	28 students (tertiary level, domain: Tourism English)	Est-SILL MSLQ SRL-SRS Content test Semi-structured interviews	t-test (Bonferroni correction), correlation analysis, thematic analysis

### 3.1 Part I – Language learning strategies

#### 3.1.1 Study I – Adapting SILL and exploring its factor structure

In Estonia, the use of language learning strategies has not been studied regularly, partly because of the lack of a reliable measurement instrument. This was one of the reasons for starting the adaptation process of SILL. When translating a measuring instrument into another language, it is necessary to critically evaluate the instrument that has been designed and validated in one cultural context, in the context of another culture. Differences when interpreting certain terms determine the necessity to adapt them to make them understood in a different culture. The aim of the adaptation process is to achieve the highest possible unequivocalness and equivalence (Guillemin et al, 1993). Cross-cultural adaptation includes translating the original instrument while assuring the validity and reliability of the adapted version.

### **3.1.1.1 Instrument**

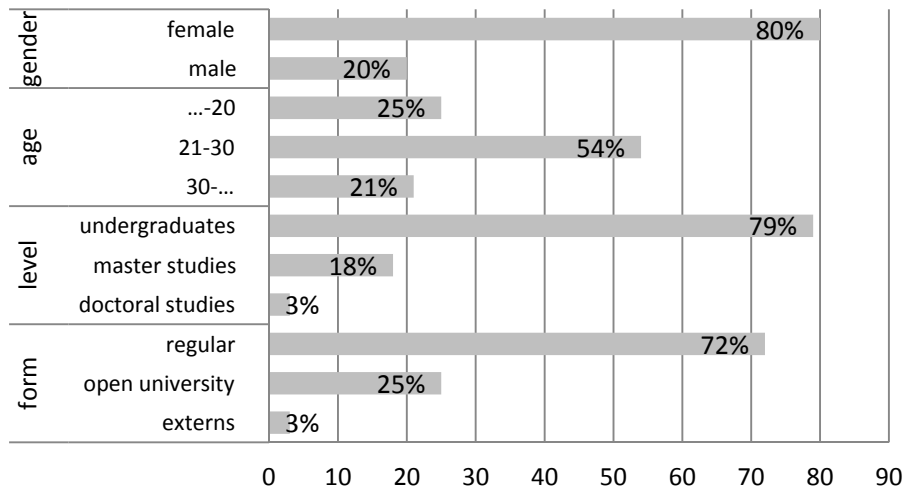
The self-report questionnaire SILL (see Appendix 1) involves 50 items. These are the statements that express learners' activities or learning strategies while learning a foreign language. The items are divided into six groups according to the division of strategies by Oxford (1990): memory strategies – 9 items, cognitive strategies – 14 items, compensation strategies – 6 items, metacognitive strategies – 9 items, affective strategies – 6 items, and social strategies – 6 items. The students assessed all items in the Likert-type scale from 1 to 5 where 1 stands for *Never or almost never true of me*, and 5 *Always or almost always true of me*. The questionnaire started with a brief introduction where respondents were explained the idea of the instrument. They were also encouraged not to answer how they thought they should be as there were no right or wrong answers to the statements.

In the adaptation process of SILL into Estonian, the adapted version of Guillemin's five-step methodology (1993) was used, which covered (1) translating the original instrument into Estonian by one translator, (2) back-translation by three independent translators to check if the translated version reflected the same content of terms used in the original version, (3) assessing, analysing and comparing all back-translations and the source text, (4) semantic editing and correcting the Estonian version, (5) linguistic editing by an Estonian language expert, (6) asking the respondents to assess the overall usability of the adapted instrument and the unequivocalness of terms while pre-testing.

In the adaptation process no big changes were made in the questionnaire. Almost all terms used in the original version and translated into Estonian were familiar and understandable for Estonian learners and they were comprehended unambiguously. The only change which was made in the adaptation process will be explained below.

### **3.1.1.2 Sample**

To pilot-test the Estonian version of SILL, data were collected from the students of the University of Tartu in March and April, 2013. The participants were majoring in different domains – economics, social work administration, teacher training, science, mathematics, law, psychology, etc. The students of philology were not included in the study because their learning experience and use of language learning strategies may be significantly different and more advanced compared to students of other domains. The sample was 374 students (the total number of students in the University of Tartu is approximately 18,000), of which 337 sent back their questionnaires filled in completely. The 37 questionnaires that were not complete were not included in the study. Although the sample may not represent the population in general, it gives an indication of the use of LLS among tertiary students in one university in Estonia. The following diagram (Figure 3) presents the social-demographic traits of the sample.



**Figure 3.** Sample division by gender, age, level and form of studies (numbers given in percentage)

### **3.1.1.3 Data collection**

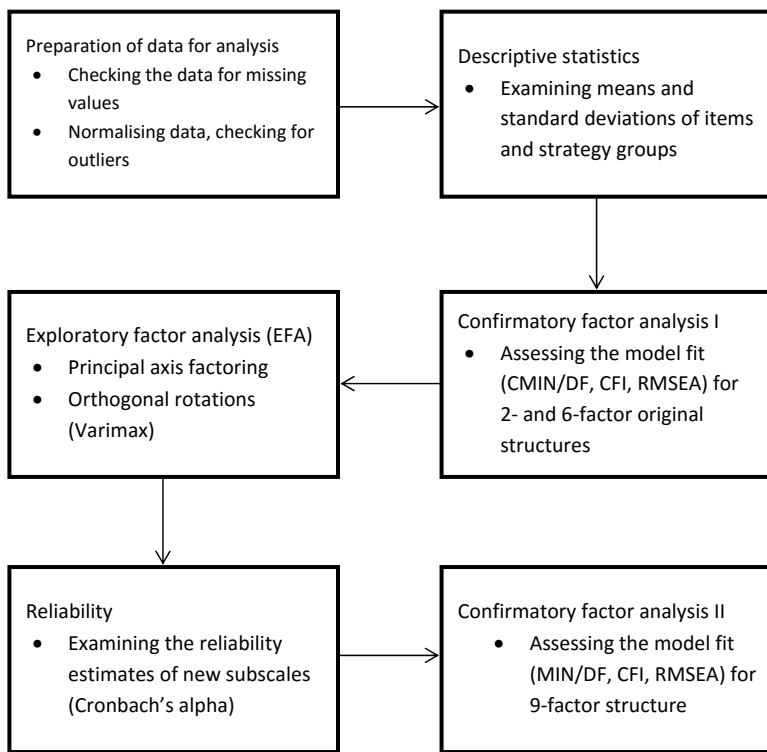
Data were collected on a voluntary basis, partly in the classroom and partly electronically. In the classroom setting participants completed the questionnaire individually with the test leader present who instructed the participants beforehand. For electronic questionnaire the environment LimeSurvey was used and the instructions were added at the top of the questionnaire. The respondents were addressed and the URL of the questionnaire was forwarded via study departments. In the electronic form of the questionnaire the statements were presented in one page. This made it possible for students to see all questions at a time, move backwards and forwards, and make corrections if they considered it necessary. Completion of the questionnaire took the students approximately 25–30 minutes.

### **3.1.1.4 Data analysis**

An overview of the statistical procedures applied in Study I is given in Figure 4.

Prior to statistical analysis, the respondents' answers were standardised to search for outliers. There was one outlier in the database which led the researchers to delete the item from the Estonian version of SILL. This was item number 43 in the affective strategies group: *I write down my feelings in a language learning diary*. Feedback from participants relating to this item confirmed that they did not really understand it as they had never used a learning diary and could not even imagine what it was. The use of learning diaries is not widespread in Estonian pedagogical practice.





**Figure 4.** Statistical procedures applied in Study I

To answer the research question on the factor structure of SILL – *Which factor structure does SILL, translated and adapted for Estonian EFL learners, reflect?* a confirmatory factor analysis, using Maximum likelihood method, was performed and the 2- and 6-factor structures of the original questionnaire were tested. In the case of CFA, model fit is exposed by model fit indices. In the current study the following indices were used: CMIN/DF (chi-square divided by its degrees of freedom), CFI (Comparative Fit Index) and RMSEA (Root Mean Square Error of Approximation). The model fit may be considered acceptable if  $CMIN/DF < 3.0$ ,  $CFI \geq 0.9$  and  $RMSEA \leq 0.06$  (Hu & Bentler, 1999). RMSEA bigger than 0.08 is not an acceptable error (Brown, 2006).

Due to the poor fit to data of 2- and 6-fold structures, an alternative 9-factor structure was chosen to test (Oxford & Burry-Stock, 1995) with the purpose of making it possible to compare the results with similar analyses conducted by the researchers in Puerto Rico, Taiwan, China, Japan, Egypt and the United States (Oxford & Burry-Stock, 1995). For that purpose, exploratory factor analysis (EFA) using principal axis factoring was performed. As it was probable that the factors are correlated rather than orthogonal (Hsia & Oxford, 2002; Park, 2011), oblique rotation method (Direct Oblimin) was used to test the intercorrelations of the factors. If correlations exceed the threshold of .32, then there is 10% or more overlap in variance among factors, enough variance to warrant oblique

rotation (Tabachnick & Fidell, 2007). However, all correlations in the present solution remained between .022 and .295 which justified using orthogonal rotation (Varimax). Factor loadings greater than or equal to 0.4 were considered acceptable.

The reliability of the new scales was assessed with Cronbach's alpha, the acceptable estimates of which should excel 0.6 (Nunnally & Bernstein, 1994). The model fit of the new 9-factor structure was tested again with CFA. Data management and analysis were performed using SPSS 19 and Amos.

### **3.1.2 Study II – Validating SILL and testing its predictive validity**

As the findings of Study I were not acceptable, the searches for a better factor structure had to be continued in order to get a sound and valid instrument for measuring learners' LLS. In addition to Oxford's theory (1990), Cohen's (1996) and O'Malley and Chamot's (1990) were also considered. Therefore, Study II focused on finding the most solid factor structure fitting to data and testing its predictive validity towards learning outcomes.

#### **3.1.2.1 Sample**

The sample of the study was 383 12<sup>th</sup>-grade students in secondary schools in one town in Estonia, 269 of them (71% of all 12<sup>th</sup>-grade students in this town) were present to fill out the questionnaire. All 269 questionnaires were complete and included in the study. Although the sample may not represent the population in general, it gives a good overview of final-grade students in one of Estonia's medium-sized towns. The average age of the students was 18.4 (SD=0.5). The number of girls and boys was almost equal (55% were female, 45% were male). By the time they answered the questionnaire, they had been studying English for approximately 10 years (M=10.22, SD=1.3).

#### **3.1.2.2 Data collection**

The participants were recruited from secondary schools in a medium-sized town of Estonia. The governing bodies of the schools which the adolescents attended were asked for permission. Data were collected on a voluntary basis. Students were explained that with their agreement, the data collected with the questionnaire would be analyzed along with the results of their English state exam that they wrote 2 months later. The students confirmed their consent with signature. The participants completed SILL individually in a class setting with the test leader present. The test leader instructed the participants. The completion of the questionnaire took the students approximately 25–30 minutes.

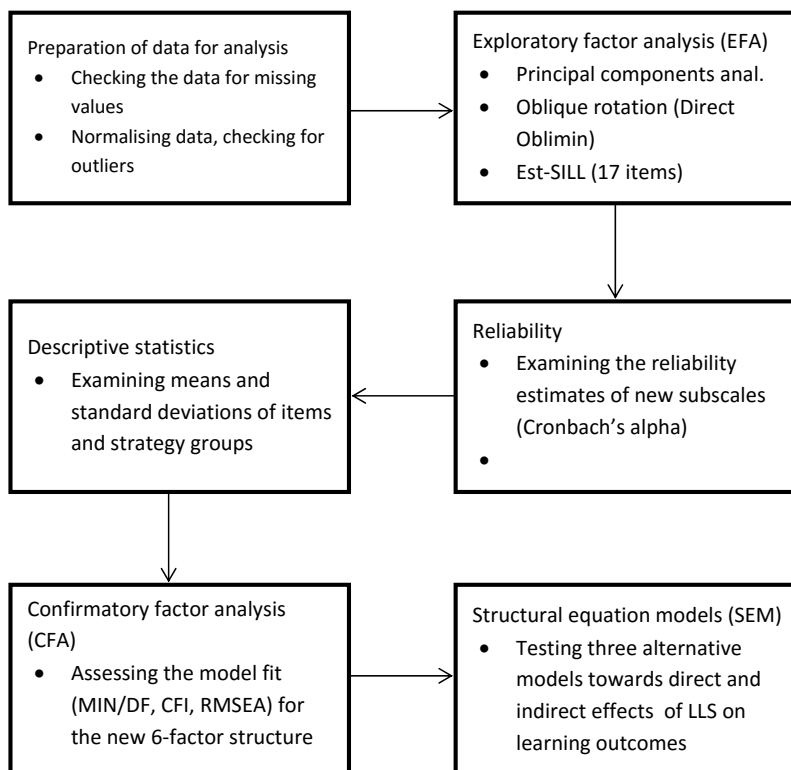
The English state exam is a standardised test which is administered and scored in a consistent manner. Its aim is to warrant nation-wide comparability

of exam results, provide students with more objective understanding of their learning outcomes, get an overview and give feedback on the efficiency of teaching and learning at school, support curriculum application, and control the attainment of learning outcomes defined with national curriculum when understanding oral speech (listening competencies), oral communication (speaking competencies), understanding written texts (reading competencies), written communication (writing competencies), and accurate use of language structures (Tasemetööde..., 2010). The exam is based on the national curriculum of basic schools and gymnasias, and Common European Framework and corresponds to the descriptions of European Council's language levels B1 and B2.

The English state exam consists of four parts according to four language competencies. Writing part (2 tasks) and listening part (5 tasks) give both 25% of the total scores, reading part (7 tasks) gives 30%, and speaking part (2 tasks) gives 20% of the scores.

### 3.1.2.3 Data analysis

An overview of the statistical procedures applied in Study II is given in Figure 5.



**Figure 5.** Statistical procedures applied in Study II

Before the statistical analysis, the data were normalised to search for outliers. Similarly to Study I, an outlier connected with the item number 43 (*I write down my feelings in a language learning diary*) appeared which was the reason of omitting it from the questionnaire.

To answer the first research question about the factor structure of SILL translated and adapted into Estonian, exploratory factor analysis with principal components method was conducted. As the possibility of factors being correlated was considered, oblique rotation (Direct Oblimin) was performed to test the correlation. Unlike Study I, the majority of factors' correlation coefficients remained between .205 and .340. Therefore, it was more appropriate to continue with oblique rotation method.

The means and standard deviations of the items and new strategy groups were described. The reliability of new scales was estimated using Cronbach's alpha with the value of 0.6. To test the model fit confirmatory factor analysis (Maximum likelihood) was used. In order to assess the goodness of the model the indices of CMIN/DF, CFI and RMSEA were used.

To answer the second research question on the relations of language learning strategies and learning outcomes, three different structural equation models were created and tested. When creating the models, earlier research results and the results of correlation analysis were taken into account. The first, unitary model (Figure 6) was created provided that all strategy groups contribute directly to the results of all four language competencies. In other words, cognitive and metacognitive strategies were assumed to perform in synergy affecting test results.

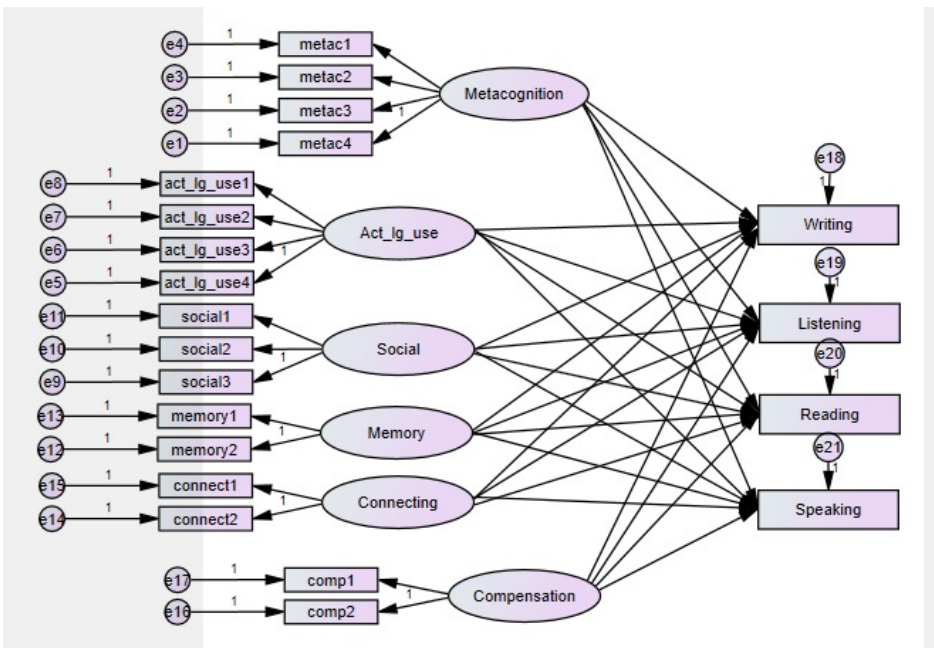
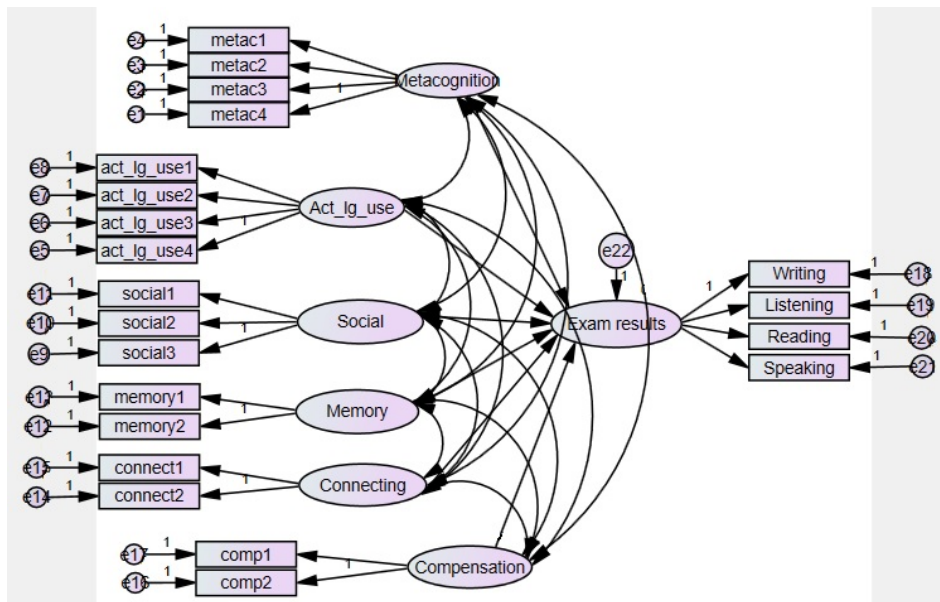


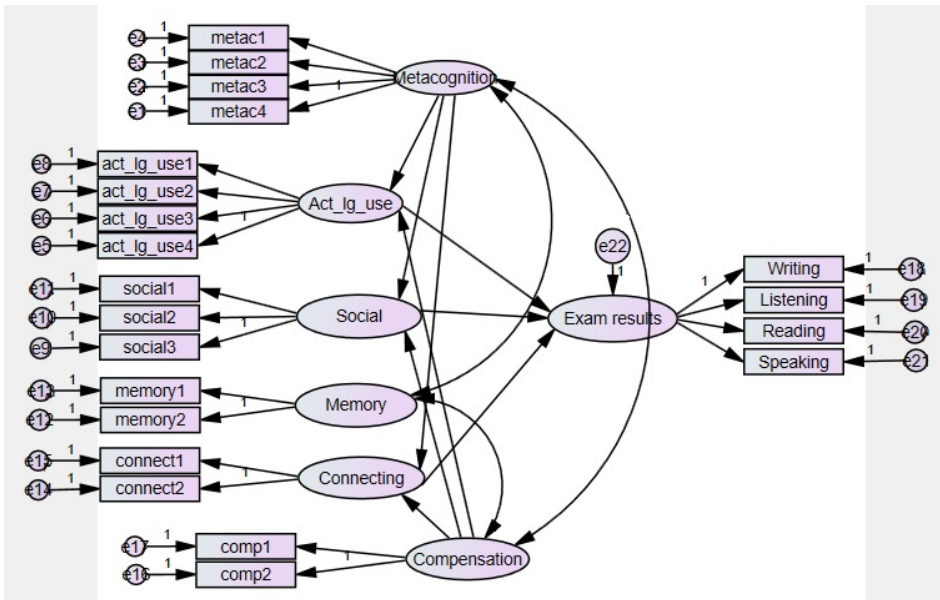
Figure 6. Unitary model

For the second model, correlations between the language competencies were considered. To avoid multicollinearity between the highly correlated variables, a latent variable to describe all four language competencies as a whole, was included. As the four-item factor (Exam results) gave good model fit indices ( $\chi^2=3,97$ ;  $df=2$ ;  $CMIN/DF=1,98$ ;  $CFI=,99$ ;  $RMSEA=,061$ ), we continued to find the most suitable solution proceeding from the logic of a hierarchical model (Figure 7).



**Figure 7.** Hierarchical model

The third, mediated-hierarchical model (Figure 8) drew on theories on learning strategies affecting learning outcomes directly and indirectly (Purpura, 1997; Zhang et al, 2014). This model was based on the results of correlation analysis. The correlation coefficients revealed that metacognitive and compensation strategies were related to other strategy groups but not with learning outcomes. Therefore, it became important to test whether the metacognitive and compensation strategies affected learning outcomes directly or indirectly through other strategy groups.



**Figure 8.** Mediated-hierarchical model

The analyses were performed using SPSS 20 and AMOS.

## **3.2 Part II – Supporting learner’s cognitive and metacognitive strategies**

### **3.2.1 Design-based research**

Part II of the current study was conducted using design-based methodology. The design-based approach was considered most appropriate for the current study because of the focus on designing the learning environment that supported EFL learners’ cognitive and metacognitive strategies. The design-based approach is believed to provide information on the possibilities as well as shortcomings of the most efficient learning environment, and enables to reinforce the intervention and the design of the course in general to achieve maximum results in the real-life language learning setting.

Design-based research (DBR) was first introduced with the term of design experiments (Brown, 1992). It was developed in order to carry out formative research to test and refine educational designs based on principles derived from prior research (Collins et al, 2004). According to its initial idea, the method is used for designing an innovative learning environment, and simultaneously conduct an experimental study of those innovations (Brown, 1992). Effective intervention should be transferrable from the experimental classroom to average classrooms „operated by and for average students and teachers, supported by realistic technological and personal support“ (Ibid).

Design-based research offers several advantages compared to other experimental designs starting with research results that consider the role of social context and impact on educational practice, but also the programs that are transferrable and replicable in other similar classrooms (Messick, 1992 as cited in Barab & Squire, 2004). This methodology enables to observe the learning process in a naturalistic context being designed and re-designed by the researcher (Barab & Squire, 2004).

For this study, design-based methodology was chosen to apply because the whole research was conducted in the real-life setting of an English course. Tourism English as Professional English is a mandatory course of the curriculum of Tourism and Hotel Management. As it belongs to the curriculum of an applied higher education, it involves many intersections with the practical tasks and activities that the learners have to complete within their studies, and this makes the whole setting even more authentic and connected with real life.

While laboratory experiments involve a single or a couple of dependent variables, design-based experiments involve multiple dependent variables, including climate, outcome and system variables (Collins, 1999). The variables which were observed, measured and explained in the current study were outcome variables (learners' use of language learning strategies, self-regulated learning strategies and content knowledge), and climate variables (learners' perceptions of the learning environment, intervention, and prompts). The learning situation in all its complexity was observed and characterised, and the changes were made in the following phase according to the quantitative results and learners' feedback. The procedures of the study involve flexible design revision where the tentative initial set was revised and adopted depending on their success in practice.

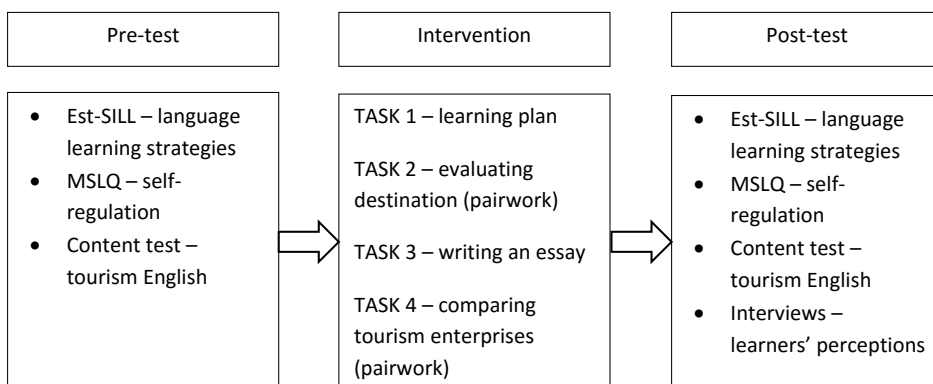
The learners were not isolated in the learning process compared to classical experimentations. The researcher had control over learners' activities and interactions in the classroom, partial control in the web-based learning environment (i.e Moodle), and no control outside these. Considering the fact that two assignments of the course were pairworks, the learners were free to work on these in the classroom, in the web-based environments or on their own, and the researcher might have no impact on their social interactions, sharing ideas, discussions, distractions etc.

### **3.2.2 Design of the research**

The study described in Part II was conducted using design-based research which consisted of two phases. Phase 1 is described in Study III, and Phase 2 is described in Study IV.

In both phases pre- and post-test design was used. As the aim of the study was to support learners' use of cognitive and metacognitive learning strategies, pre-tests were used to measure students' use of language learning strategies, self-regulated learning strategies and content knowledge as a baseline (Figure 9). The

intervention consisting of 4 learning assignments was designed to support learners' cognitive and metacognitive strategy use, and to improve the learners' content knowledge of tourism English. Post-tests were used to measure the change of learners' strategy use and content knowledge. Semi-structured focus-group interviews were conducted at the end of the course to investigate learners' perceptions of the design of the course, the learning environment, the assignments and support provided throughout the course. The results of quantitative analyses and learners' feedback obtained in Phase 1 triggered the improvements in Phase 2 of the study.



**Figure 9.** Design of research in Phase 1

### **3.2.3 Study III – Testing the efficiency of the first intervention in the blended course of Professional English**

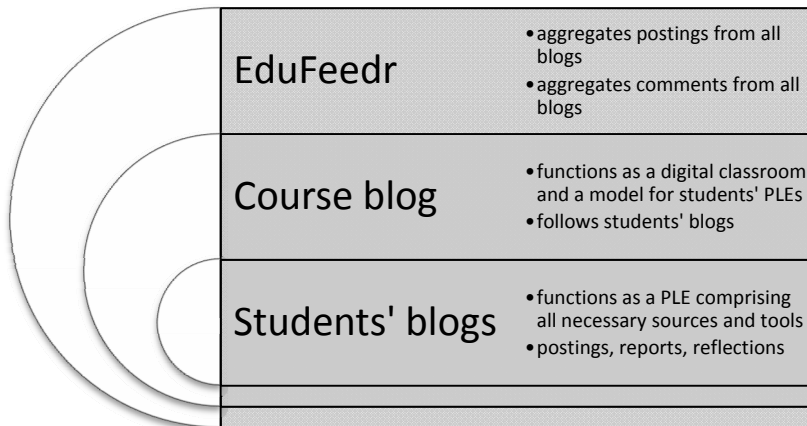
#### **3.2.3.1 Sample**

Phase 1 of the research was carried out in the autumn of 2013. The sample comprised 28 first-year students who took the Tourism English course (Professional English). This was a mandatory course which lasted for four months (40 academic lessons). The course took place in the autumn semester of the first year which means that the students starting the course barely knew each other, and there were no strong social connections between them. The sample was made of four males (14%) and 24 females (86%). The average age of the students was 19.5 (SD=1.1). By then, they had studied English for approximately 10 years (M=10.04, SD=2.3). The average score of the national English examination that they had taken four months earlier was 73.6 points out of 100 (SD=17.4). In 2013, the average result of the English state exam in Estonia was 72 points (SD=16.4) (Riigieksamite statistika 2013, 2013).



### 3.2.3.2 Learning environment

Tourism English is a course which is classified as Professional English. This means that content (tourism) and language (EFL) are taught in combination. The Tourism English course which was the domain of the present research was a blended course comprising 40 contact classes and 38 hours of independent studies supported by a web-based learning environment. For this course the web-based environment was designed proceeding from the principles of personal learning environment (PLE), which combined the feed aggregator, course blog, and the students' personal blogs. The aggregator, EduFeedr, was programmed at Tallinn University (Põldoja, 2009) and is successfully used in many open education courses. EduFeedr was used to bring together all posts and comments with a specific tag from the course blog and students' blogs (Figure 10). The course blog, which was written and managed by the teacher, served as a model for students when building up their own PLEs based on blogs.



**Figure 10.** The functions of feed aggregator and blogs in the Professional English course

In the first class the environment and its tools and affordances were demonstrated. The students were shown how to start the blog, how to add in-built widgets and external Web 2.0 tools, and how categorizing and tagging works. Students were also told which tools had been aggregated to the course blog and why. They learned about the affordances of Dropbox, bookmarking, embedding, and so on. In addition to technical affordances, they discussed the didactic affordances proceeding from students' needs and expectations. The environment was used to co-ordinate work in the classroom and students' independent work at home, uploading assignments, commenting and giving feedback, and storing necessary learning materials. Students used their blogs to reflect their learning process, upload their coursework, communicate within pairwork, comment and give feedback to peers, add widgets that supported their learning activities and link

the learning materials. Unlike students in other similar studies (Ullrich et al, 2010), our learners had no difficulties when choosing and applying Web 2.0 tools in their PLEs. Most of them had previous e-learning experience, as using ICT is common in all educational levels in Estonia.

### **3.2.3.3 Intervention**

Taking the theoretical frameworks of language learning strategies by Oxford (1990) and self-regulated learning by Pintrich (2000) as a basis, a model for supporting learners' cognitive and metacognitive learning strategies for the blended Tourism English course was developed. Pintrich distinguished four areas for SRL (cognition, motivation and affect, behaviour, and context). In this study, all these areas were considered throughout the four phases: planning, monitoring, control and reflection.

For this course, four specific language learning assignments were created to support the development of students' cognitive and metacognitive strategies (Table 3). The assignments were specially designed to take maximum advantage of the affordances of the digital learning environment (the combination of blogs and feed aggregator). Special attention was paid to students' active use of language when solving problems connected with real-life situations in the tourism industry (Tasks 2 and 4). The four assignments were accompanied by other tasks which were carried out in the class in the course of regular studies: reading and analysing texts, summarizing, comparing and contrasting etc. Students' interaction and communication were encouraged throughout the whole learning process, as well as in preparatory and follow-up phases. All learning activities were reflected orally in the classroom as well as in written form in students' learning diaries.

The first assignment designed for the intervention was compiling a learning plan. It started with oral discussion in the class where students were guided to think on the goals they had when starting the course, also their needs considering their level of language skills, the cognitive strategies they were used to employing when learning a language, the ways of assessing and giving feedback that could be most beneficial for them. As this was a new activity for many students, it was important to encourage them to open up and express their doubts and expectations. It was also important to explain why it was necessary to set goals and plan their activities beforehand. As a follow-up activity, the students wrote their answers in their blogs which became their first submission. Learning plan is not a complete document. Students were encouraged to return to it any time they felt that they could change or complete it. It was important to explain to the students that learning plan was an open document and their entries could be modified according to their needs, interests and level of development. The students' blogs served as diaries where students recorded their thoughts and reflections during the whole learning process.

The second and the fourth assignments were both pairworks and followed the same structure – collecting information about a destination or certain tourism enterprises, compiling a comparison or summary and making a presentation on the results. The main value of this task was its possibility to connect the real-life situation with language learning. The tasks were set so that learners had to solve authentic problems using authentic materials and be able to justify their decisions. Similarly to the other tasks, they started with the class discussion to arouse interest and activate prior content and metacognitive knowledge. Since these tasks combined individual work and pairwork, the students employed in addition to self-regulative activities, also socially shared regulative activities (Panadero et al, 2015). Students applied metacognitive, social and active language use strategies to set goals, plan their activities and time schedule, and divide the tasks together. Also, the independent work in the digital learning environment which followed the preparatory work in the class, demanded employing various cognitive and metacognitive strategies. The oral presentations in the class were followed by reflection of the whole process. Students were encouraged to share their impressions and self-evaluate their activity as an individual and as a pair.

The third assignment was writing an essay. The reason why this assignment was included in the intervention was its focus on supporting reading, writing and compensation as cognitive strategies in addition to metacognitive ones. The assignment started with the class discussion again where the students were explained the assignment and interest towards the task was aroused. This was followed by setting goals, making plans for writing and time planning. The essay was written at home as an independent task. As a follow-up activity in the class, the discussion on the whole writing process was encouraged. Students were asked to share the problems they faced when writing, regulation processes they took up to overcome the problems and they were also asked to self-evaluate their activity throughout the whole process.

**Table 3.** Assignment descriptions

Assignment	Description	Applicable strategies
TASK 1 Learning plan	Discussing students' expectations from the course: needs, learning styles and habits, expectations from the teacher, etc. Formulating learning plans on the blog. The learning plan is presented and explained at the beginning of the course.	Metacognitive – analyzing needs, setting goals for the course, identifying prior knowledge, planning appropriate strategies. Cognitive – activating prior learning strategies. Compensation – freedom to express one's own ideas using their own vocabulary in written form.
TASK 2 Evaluating a destination (in pairs)	Collecting information about a new destination and analyzing its suitability as a tourism destination (geographical location, access, natural features, social and political features, general price range, etc.). The work process is described on the blog. An oral presentation is given with the results described and demonstrated. Self-assessment and peer assessment is made on the basis of the rubrics provided.	Metacognitive – setting goals for the task, planning the task, time management, division of work, activating prior knowledge, self-evaluation. Cognitive – working with source material, scanning, critical reading, comparing/contrasting, summarizing. Compensation – creative thinking when guessing the meaning from working with new material, expressing ideas in both written and oral forms using one's own vocabulary. Social – negotiating, compromising, decision-making, peer assessment.
TASK 3 Essay	Selecting attractions in one's home place, gathering information, writing an essay, and illustrating the post with appropriate photos and/or videos. Before posting on the blog, the student must read the rubrics of the assessment. Other students' posts are read and feedback is given to them.	Metacognitive – setting goals for the task, planning the task, time management, activating prior knowledge, self-evaluation. Cognitive – working with source material, scanning, critical reading, summarizing. Compensation – guessing the meaning when working with new material, expressing ideas in written form using one's own vocabulary. Social – peer assessment.
TASK 4 Comparing tourism enterprises (in pairs)	Compiling a comparison of three tourism enterprises (hotel, restaurants, adventure parks, etc.) and presenting the findings orally. The process is described on the blogs, where students also self-assess their work individually and as a pair.	Metacognitive – setting goals for the task, planning the task, time planning, division of work, activating prior knowledge, self-evaluation. Cognitive – working with source material, scanning, critical reading, comparing/contrasting, summarizing, presenting. Compensation – guessing the meaning when working with new material, expressing ideas in written form using one's own vocabulary. Social – negotiating, compromising, decision-making, peer assessment, presenting.

### 3.2.3.4 Data collection

In order to detect possible changes regarding students' language learning strategies, self-regulation and content knowledge, pre- and post-test design was employed. Both tests included measures of language learning strategies (Est-SILL), self-regulation (MSLQ) and content knowledge of Tourism English.

The use of LLS was investigated with Est-SILL which is a translated, adapted and validated questionnaire based on Oxford's SILL (1990) (Article I, Article II) (see Chapter 4.1.2). Est-SILL comprises 17 statements that respondents assess on the Likert-type scale from 1 to 5, higher points refer to a more frequent use of strategies. Est-SILL consists of 6 factors – active language use (these are the strategies which express the learner-initiated use of language in real-life situation, and is a combination of cognitive and social strategies by Oxford), metacognitive (express planning, monitoring and evaluating learning activities), social (used for asking for help and providing help in the language learning situations), compensation (these strategies are used to overcome gaps in knowledge), memory (mnemonic strategies which facilitate memorizing new material) and connecting strategies (used for activating prior knowledge and connecting with new information). The model fit indices of the questionnaire are good ( $\chi^2=222.403$ ,  $df=104$ ,  $CMIN/DF=2.138$ ,  $CFI=.906$ ,  $RMSEA=.065$ ) (Article II).

To measure the learners' self-regulative learning strategies a self-report questionnaire – Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al, 1991) was used. MSLQ was translated and adapted for Estonian learners. As a result of EFA, a new factor structure with two scales was received. The two scales were motivation and strategies where the respondents assessed the statements on the Likert-type scale from 1 to 7, higher points referred to more frequent use of strategies (see also Saks et al, 2015b). The motivation scale had got 27 statements in 6 factors – intrinsic motivation and external motivation, task value, control of learning beliefs, self-efficacy and test anxiety. The model fit indices of the scale were acceptable ( $\chi^2=875.275$ ,  $df=309$ ,  $CMIN/DF=2.833$ ,  $CFI=.850$ ,  $RMSEA=.075$ ). The strategies scale had got 34 statements divided into 7 factors – rehearsal, organization, connecting strategies, effort regulation, metacognitive self-regulation, time and study environment and peer-learning (Appendix 3). The model fit indices were as follows:  $\chi^2=1095.866$ ,  $df=507$ ,  $CMIN/DF=2.161$ ,  $CFI=.850$ ,  $RMSEA=.060$ .

Students' content knowledge was measured with the test compiled by the author of the dissertation proceeding from the course content and expected outcomes of the syllabus. The test included tasks that combined reading, writing and vocabulary use and completing the tasks was supported by the use of connecting, compensation and cognitive strategies. Considering the fact that the course was Professional English, the students had to explain tourism-related terminology. The tasks combined thematic vocabulary and the use of language skills. Also, they had to compare and contrast different places of accommodation and tourism services. A good example of a combined task was a writing

assignment. Students had to compile a reply to a letter of complaint. They had to read it through, identify the complaints, and write a reply using specific vocabulary, following the rules of a formal letter, and using their content-specific and language knowledge. The data were collected with a pre- and post-test which both contained 13 tasks. The tasks were graded with points which were re-calculated into per cents later.

All pre- and post-tests were conducted in the classroom where students filled in the questionnaires in paper copies. Students were informed about the aim and procedure of the research, and the assurance of confidentiality beforehand.

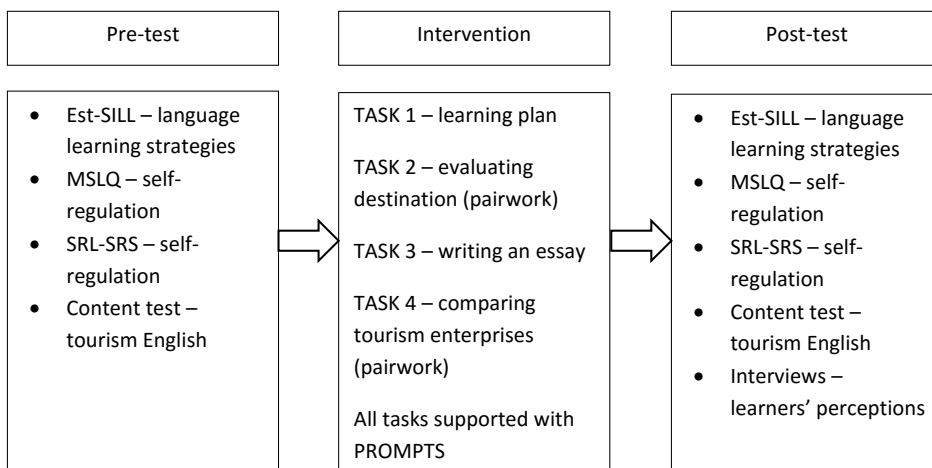
To collect additional information about the students' learning process, three semi-structured focus-group interviews were carried out with a total of 16 students. Five or six students participated in each group interview. The interviews lasted approximately one hour and they investigated students' perceptions of the design of the course, the learning environment, the assignments and support provided throughout the course.

### **3.2.3.5 Data analysis**

To compare the data collected from pre- and post-tests, t-tests with Bonferroni correction were employed to see the changes in strategy use and content knowledge as a result of intervention. The Bonferroni correction is an adjustment which is made to  $P$  values when several dependent or independent statistical tests are being performed simultaneously on a single data set. The Bonferroni correction is used to reduce the chances of obtaining false-positive results (type I errors) when multiple pair wise tests are performed on a single set of data (Napierala, 2012). The correlation analyses were conducted to investigate the relations between strategy use and learning outcomes. The interviews, which were carried out after the course, were fully transcribed and analyzed based on the rules of thematic analysis (Ryan & Bernard, 2003) by one researcher.

### **3.2.4 Study IV - Testing the efficiency of the second intervention enhanced with prompts**

According to the principles of DBR, the changes were made in the learning environment as well as intervention based on the results of the preceding phase. The results that appeared in Phase 1 (see the results of Study III, Chapter 4.2.1) triggered the changes and improvements in Phase 2. The design of the research stayed basically the same (Figure 11). The changes were made concerning the intervention which was enhanced with prompts, the learning environment which was transferred from personal learning environment to a learning management system (Moodle), and measurement which was complemented with SRL-SRS to have a deeper insight into learners' self-regulated learning activities.



**Figure 11.** Design of research in Phase 2

### 3.2.4.1 Sample

In 2014/2015, the data were collected from 28 students, 5 male (17.8%) and 23 female (82.2%). Although it was a new cohort, their characteristics resembled to the previous one in great extent. The average age of the students was 20.18 (SD=3.35), the duration of their previous English studies was approximately 10 years (SD=2.13), the average score of the national English examination having been taken four months earlier was 75.14 points out of 100 (SD=13.8). In 2014, the average result on the English state exam in Estonia was 67.5 points (SD=21.0) (Kriisa, 2014). The samples resembled to each other in main demographic data and the level of English. A slightly higher result in the national English exam (compared to 2013, M=73.6; SD=17.4) was not statistically significant. Neither could be detected any differences between the samples based on the comparison of their strategy use in pre-tests (see Figure 14).

### 3.2.4.2 Changes and improvements in the learning environment and intervention

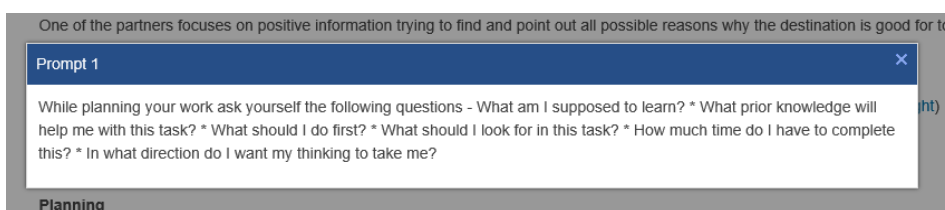
Proceeding from the results of Phase 1 (see Chapter 4.2.1), and according to the principles of DBR, several changes and improvements were made in the research design and the learning environment in order to enhance the support to learners’ use of cognitive and metacognitive learning strategies. The improvements involved changes in the web-based environment which was moved from EduFeedr to Moodle, and the intervention which was enhanced with prompts.

Although EduFeedr enabled to aggregate all necessary components of the course (course blog, students’ blogs, Dropbox etc) to one site, it remained confusing and not easily navigable for many students. Proceeding from their

critical feedback given in the interviews and learning diaries, the learning environment was moved from EduFeedr to Moodle. This is the most widely-used learning management system (LMS) in our universities, and familiar to the students from other courses. Unlike EduFeedr, Moodle enables to upload and present all study materials, resources and activities in one site. They are well-organised, visible and easily accessible for users. To facilitate using the learning environment, a lot of cross-referencing was used (by *cross-referencing* we mean using double links in different resources, descriptions and instructions to facilitate navigating).

Due to the little improvement in learners' strategy use, the intervention had to be reinforced (Table 4). It was re-designed proceeding from the principles of metacognitive scaffolding (Hannafin et al, 1999). In the re-designed intervention, cognitive and metacognitive strategies were supported concurrently as former studies have shown that combined scaffolding of the two gives the best results in the support of self-regulation as well as content knowledge (Berthold et al, 2007; Brunstein & Glaser, 2011; Lee et al, 2010a). When improving the intervention, special attention was paid to providing the assignments with appropriate prompting, cognitive as well as metacognitive. Earlier studies had demonstrated that the frequency of use of certain self-regulatory processes were consistently associated with learning gains (Winters et al, 2008), therefore, similar structure and similar logic of prompting was used throughout the course. The intervention and the efficiency of the developed scaffolding was tested within the next phase of the research.

The learning assignments were customised to take maximum advantage of the affordances of the digital learning environment Moodle. The students were provided with the facilities that supported their learning activity – forums, personal drafting places, extra vocabulary self-tests, collaborative writing and brainstorming facilities etc. As the major improvement of the course design, the assignments were provided with cognitive and metacognitive prompts. These were added in the guidelines of the assignments or reading texts as hyperlinks. The prompts, presented in the form of questions, opened in small pop-up windows (Figure 12).



**Figure 12.** An example of a pop-up window with prompts for planning



**Table 4.** Model for supporting cognitive and metacognitive strategies in a blended Professional English course

Level 1 – F2F work in the classroom	Strategies supported with oral prompting		Level 2 – independent work in the web-based environment	Strategies supported with written prompting	
	Metacognitive strategies	Cognitive strategies		Metacognitive strategies	Cognitive strategies
TASK 1 Learning plan – discussion based on questions given	setting goals for the course, planning the activities and strategies	oral expression, discussing, justifying opinion	TASK 1 Learning plan – writing the learning plan answering the questions given	setting goals for the course, planning the activities and strategies, monitoring, evaluating	writing strategies, compensation strategies
TASK 2 Evaluating destination (pairwork) – instructions, discussion, making a plan	setting goals for the task, dividing the tasks, planning the activities, time planning, evaluating	oral expression, discussing, justifying opinion, making a presentation	TASK 2 Evaluating destination (pairwork) – working with resource materials, discussion, making a presentation, commenting on others' works	activating prior knowledge, time planning, monitoring his activity, evaluating the outcome of his activity	searching information, analysing, critical evaluation, reading and writing str.
TASK 3 Essay – instructions, discussion, making a plan	setting goals for the task, planning the activities, time planning, evaluating	oral expression, discussing, justifying opinion	TASK 3 Essay – working with resource materials, writing an essay, uploading it to the web, commenting on others' essays	activating prior knowledge, time planning, monitoring his activity, evaluating the outcome of his activity	searching information, analysing, critical evaluation, reading and writing str.
TASK 4 Comparing three enterprises (pairwork) – instructions, discussion, making a plan	setting the goals for the task, dividing tasks, planning the activities, time planning, evaluating	oral expression, discussing, justifying opinion, making a presentation	TASK 4 Comparing three tourism enterprises (pairwork) – working with resources, discussion, making a presentation, commenting on others' works	activating prior knowledge, time planning, monitoring his activity, evaluating the outcome of his activity	searching information, analysing, critical evaluation, reading and writing str.

The idea of prompts was to make the learners think on and analyse their activities in their learning process. For example, in the phase of self-monitoring students were displayed the following prompts: *While monitoring your work ask yourself the following questions: How am I doing? Am I on the right track? How should I proceed? What information is important to remember? Should I move in a different direction? Should I adjust the pace because of the difficulty? What can I do if I'm stuck?* Similar prompts were displayed to the students in all phases of self-regulation. Throughout the course formative assessment activities and formative feedback were provided as according to Irons (2008), and Zou and Zhang (2013) these promote students' self-regulated learning. Earlier research has also shown that the efficiency of the use of learning strategies and academic achievement are directly related to the frequency of the use of self-regulative processes (Azevedo, 2005; Winters et al, 2008), that is why a similar structure and logic of prompting was used throughout the course. The efficiency of enhanced intervention and prompting was tested within the second phase of the research.

### **3.2.4.3 Data collection**

To measure the learners' use of cognitive and metacognitive learning strategies and content knowledge, and their change as a result of intervention, the data were collected with three self-report questionnaires and a content test.

The use of LLS was investigated with Est-SILL. To measure the learners' self-regulative learning strategies two self-report questionnaires were used – Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al, 1991) (see also Chapter 3.2.3.4) and Self-Regulation of Learning Self-Report Scale (SRL-SRS) (Toering et al, 2012).

SRL-SRS was also translated and adapted for Estonian learners by the author (Appendix 4) using the same methodology as for Est-SILL and MSLQ: translation-backtranslation, adapting, piloting, testing the factor structure and reliability. The 33 statements divided into 6 factors were assessed on the Likert-type scale from 1–5, higher points showed higher level of self-regulation. The factors formed as a result of factor analysis were planning, self-monitoring, evaluating, effort regulation, time planning and self-efficacy. The model fit indices of the SRL-SRS were good:  $\chi^2=983.466$ ,  $df=480$ ,  $CMIN/DF=2.049$ ,  $CFI=.893$ ,  $RMSEA=.058$ .

The reason why different self-regulation scales were decided to use was their different approach to measurement of self-regulation. While MSLQ comprises only one scale for measuring self-regulation (metacognitive self-regulation), SRL-SRS enables to investigate three main self-regulative activities (planning, self-monitoring and evaluating) separately. Using and comparing similar subdivisions enables to observe and give sense learners' learning activities in more detail, also to investigate the effect of prompts and their efficiency more thoroughly. Pearson's correlation coefficients of metacognition and metacognitive

activities – planning, monitoring and evaluating – on the basis of three different instruments are all rather strong (Table 5). So, it can be stated that using different instruments (Est-SILL, SRL-SRS and MSLQ) we can measure self-regulation constructs that are related, and receive a deeper insight into different metacognitive activities.

**Table 5.** Correlation coefficients of the scales measuring metacognition

	metacognition Est-SILL	planning SRL-SRS	monitoring SRL-SRS	evaluating SRL-SRS	metacognition MSLQ
metacognition Est-SILL	1	0.301	0.251	0.298	<b>.481**</b>
		0.119	0.197	0.124	0.008
	28	28	28	28	28
planning SRL-SRS	0.301	1	<b>.555**</b>	0.235	<b>.384*</b>
	0.119		0.002	0.229	0.044
	28	28	28	28	28
monitoring SRL-SRS	0.251	<b>.555**</b>	1	<b>.419*</b>	<b>.379*</b>
	0.197	0.002		0.026	0.046
	28	28	28	28	28
evaluating SRL-SRS	0.298	0.235	<b>.419*</b>	1	<b>.391*</b>
	0.124	0.229	0.026		0.04
	28	28	28	28	28
metacognition MSLQ	<b>.481**</b>	<b>.384*</b>	<b>.379*</b>	<b>.391*</b>	1
	0.008	0.044	0.046	0.04	
	28	28	28	28	28

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*.. Correlation is significant at the 0.01 level (2-tailed).

Academic achievement was measured with the content test similarly to Phase 1 (see Chapter 3.2.3.4).

To collect information about the students' perceptions of their learning process and the use of prompts, three focus group interviews were conducted with a total of 15 people at the end of the course. Five students participated in each group interview. The interview questions were formulated to investigate learners' perceptions of the course in general, but more attention was paid to students' perceptions of (1) the four assignments that had been designed to support the development of their cognitive and metacognitive learning strategies, (2) the learners' perceptions of the prompts used to support acquiring cognitive and metacognitive learning strategies, (3) evaluating their use of learning strategies, and (4) their perceptions of their development as learners.

#### **3.2.4.4 Data analysis**

In order to detect possible changes regarding students' language learning strategies, self-regulative strategies and learning outcomes, the study employed pre- and post-test design. To compare the data collected from pre- and post-tests, paired-samples t-tests with Bonferroni correction were conducted. In order to compare the differences of pre- and post-tests in Phase 1 and Phase 2, and to estimate the consequences of the differences of the two designs of the learning environment, the independent samples t-test was applied. Correlation analysis was conducted to investigate the relations between strategy use and learning outcomes. The interviews, which were carried out after the course, were fully transcribed and analyzed based on the rules of thematic analysis by one researcher.

## 4. FINDINGS AND DISCUSSION

### 4.1 Part I – Language learning strategies

#### 4.1.1 Study I – Adapting SILL and exploring its factor structure

The aim of Study I was to find out which factor structure does SILL, translated and adapted for Estonian EFL learners, reflect. To answer this question several quantitative analyses were conducted: descriptive statistics, EFA, CFA and reliability analysis as presented below.

##### 4.1.1.1 Descriptive statistics

Table 6 gives an overview of the means and standard deviations of strategy use for all six strategy groups. The overall mean of the use of strategies as estimated with the Estonian version of SILL was 3.23 (SD=1.27). Considering the ranges of low (less than 2.5), medium (2.5–3.5) and high (over 3.5) frequency, the overall use of LLS in the case of the current sample of EFL learners is medium. Social strategies as a group are used with the highest frequency with a mean of 3.54, and memory strategies with the lowest – 2.85.

**Table 6.** The means of strategy groups

Strategy groups	Mean	SD
Social strategies	3.54	1.17
Compensation strategies	3.42	1.27
Metacognitive strategies	3.34	1.19
Cognitive strategies	3.33	1.23
Affective strategies	2.90	1.30
Memory strategies	2.85	1.32
Overall means	3.23	1.27

When analysing the items separately, 20 items out of 49 (41%) had a high range of use, 24 (49%) medium and 5 (10%) low. The highest scores were given to a compensation strategy – *If I can't think of an SL word, I use a word or phrase that means the same thing* (4.26), a social strategy – *If I do not understand something in SL, I ask the other person to slow down or say it again* (4.12) and a metacognitive strategy – *I pay attention when someone is speaking SL* (4.08). The lowest scores were given to memory strategies – *I physically act out new SL words* (1.52), *I use rhymes to remember new SL words* (2.01) and *I use flashcards to remember new SL words* (2.02).

#### **4.1.1.2 Results of CFA for original models of SILL**

The original two- and six-factor SILL models were evaluated through a confirmatory factor analysis using a maximum likelihood estimation. As shown in Table 7, the goodness of fit statistics for the original model did not indicate adequate model fit with the Estonian data; the CFI remained well below .90, and the RMSEA reached .07, well above the .05 criterion indicating good fit. The  $\chi^2$  statistic for the model normalised by a degree of freedom (CMIN/DF) exceeded the limit of 3.0 in the first case.

**Table 7.** The results of the CFA for the original SILL structures

	$\chi^2$	df	CMIN/DF	CFI	RMSEA
2-factor original structure of SILL	3584.893	1174	3.054	.554	.078
6-factor original structure of SILL	3293.587	1160	2.893	.605	.074

The unsatisfactory fit to the data of the original SILL model led us to seek a more suitable factor structure.

#### **4.1.1.3 Results of EFA for a nine-factor model**

In order to find a more sound factor structure, exploratory factor analysis, using principal axis factoring with varimax rotation was conducted. According to the Kaiser rule of eigenvalues, up to a 14-factor solution could have been considered. The Kaiser rule is applied to drop the components with eigenvalues under 1.0 – this is the eigenvalue equal to the information accounted for by an average single item (Larsen & Warne, 2010). Proceeding from theory and previous studies, we chose the two-, six- and nine-factor analysis to test (with eigenvalues of 3.48, 1.59 and 1.35 respectively); the first two with the purpose of checking the possible factor structures according to the division of Oxford's classification (1990), and the last one with the purpose of making it possible to compare the results with the analyses conducted with EFL learners in Puerto Rico, Taiwan, China, Japan, Egypt and the United States (Oxford & Burry-Stock, 1995).

To test the two-factor structure of SILL, EFA was conducted with a fixed number of factors. Factor loadings greater than or equal to 0.4 accounted for over 25% of the variance that explained just a quarter of the strategy use being represented by the items in SILL. In the case of the two-factor structure, it might have been assumed that two big strategy groups – direct and indirect ones – would form. However, the results of the factor analysis did not support this. The groups that formed were mixed, having 17 items of direct strategies and 7 items of indirect strategies in one factor, with the items for the other factor being 12 and 13 respectively. Therefore, it had to be admitted that the analysis on two factors did not give a satisfactory result.

In order to test the six-factor structure of SILL, exploratory factor analysis on six factors was conducted. Factor loadings greater than or equal to 0.4 accounted for over 46.3% of the variance, which explained a little less than half of the strategy use being represented by the items in SILL. The factors that formed did not coincide with the taxonomy proposed by Oxford (1990), either.

To test the nine-factor structure of SILL, exploratory factor analysis on nine factors was conducted. Factor loadings greater than or equal to 0.4 accounted for over 52% of the variance, which explained over half of the strategy use being represented by the items in SILL. Next, the newly formed factors are described and compared to the studies with EFL learners in Puerto Rico, China, Japan, Egypt, Taiwan and the US (Table 8) (Oxford & Burry-Stock, 1995).

*Factor 1* consisted basically of the strategies of active language use [similar to Puerto Rico, China, Japan and the US (Oxford & Burry-Stock, 1995)] including reading for pleasure, watching TV and films in English, writing notes and messages and looking for opportunities to read as much as possible. *Factor 2* stood for metacognitive planning [similar to Puerto Rico, China and the US (Ibid)], covering four strategies out of the nine in Part D of SILL and comprising thinking about the progress in learning a foreign language, having clear goals for improving skills, being determined to become a better language learner and planning the schedule. *Factor 3* comprised the social strategies [partly similar to Puerto Rico, China and Egypt (Ibid)] like asking for help from other foreign language speakers, asking others to correct errors while talking, asking others to slow down or say it again, asking questions in foreign language, practising it with other students and looking for people to talk to. *Factor 4* on analysis included finding patterns, dividing the word into parts to find its meaning, thinking of relationships between new and old and looking for words in one's own language resembling new words. *Factor 5* on cognitive and memory strategies included using foreign language words in different ways, summarizing information heard or read, using new words in a sentence to memorize the words better, remembering new words by using mental pictures, trying to talk like native speakers and practising the sounds of the foreign language. *Factor 6* [partly similar to Japan (Ibid)] was mostly made up of the metacognitive, social and compensation strategies of paying attention when someone is speaking, asking the person to slow down or say it again if the sentence cannot be understood, noticing mistakes and trying to do better, and using synonyms if the right word cannot be thought of. *Factor 7*, affective strategies, resembled the research results in Taiwan (Ibid) and included noticing tension when using the foreign language, rewarding oneself in the case of success, talking to others about the feelings when the foreign language is learned and trying to relax when being afraid to use the foreign language. *Factor 8*, covering the strategies of repetition and revision, included saying or writing new words several times and reviewing foreign language lessons. *Factor 9*, sensory memory strategies, covered using rhymes and connecting the sound and image to remember new words, and physically acting out new words [similar to Egypt (Ibid)].

**Table 8.** The comparison of results of 9-factor analysis between Estonia and six countries presented by Oxford and Burry-Stock (1995)

Factor/ location	Estonia	Puerto Rico	Taiwan	PR China	Japan	Egypt	Combined US
1	Active language use	Active language use	Metacognitive planning	Active language use	Active language use	Metacognitive planning	Active language use
2	Metacognitive planning	Metacognitive planning	Active language use	Metacognitive planning	Sensory memory strategies	Sensory memory strategies	Metacognitive planning
3	Social strategies	Affective and social	Memory and analysis	Affective and social	Metacognitive/social/affective	Affective and social	Affective strategies
4	Analysis	Reflection (analysis and anxiety)	Formal oral practice	Sensory memory strategies	Compensation and analysis	Active language use	Sensory memory strategies
5	Cognitive and memory	Sensory memory strategies	Social strategies	Compensation in reading	Formal oral practice	Request and repetition	Social strategies
6	Metacognitive/social/compensation	Social/cognitive conversation	Compensation in reading	Metacognitive and affective	Affective strategies	Sensory memory and anxiety	Compensation and analysis
7	Affective strategies	Sensory (visual) memory	Affective strategies	Sensory (visual) memory	Compensation in speaking	Compensation in reading and listening	Metacognitive planning
8	Repetition and revision	Cognitive and relaxation	Compensation in speaking	Attention to key details	Attention to key details	General memory strategies	General memory strategies
9	Sensory memory strategies	General compensation	General memory strategies	General memory strategies	Reflection (analysis and anxiety)	Sensory memory strategies	Compensation and nonanalytic

*Note: grey cells indicate similar factors.*



As the table reveals, the factors that evolved in the factor analysis of the Estonian version of SILL are somewhat comparable with the results of other studies in different cultures (Table 8). The grey cells in the table indicate the factors that coincide with the factors in these studies (Oxford & Burry-Stock, 1995). Even though they do not present the best taxonomy for the LLS, there are certain concurrencies with the outcomes of other similar studies.

#### **4.1.1.4 Results of reliability analysis of the nine-factor model**

The Cronbach's alpha of the constructs of the 9-factor SILL was investigated for measuring the internal consistency of the items within each construct. The results revealed that four alpha coefficients out of nine remained below the acceptable level of .60, the other strategies were above it (Table 9). The low coefficients may be caused by the small number of items in the strategy groups.

**Table 9.** Cronbach's alpha coefficients and variance of strategy groups

Strategies	Cronbach's $\alpha$	Variance	Number of items
Active language use	.82	7.81%	4
Metacognitive planning	.82	7.25%	4
Social strategies	.72	6.43%	4
Analysis	.69	6.37%	3
Cognitive and memory strategies	.69	6.25%	2
Metacognitive/social/compensation	.58	4.81%	2
Affective strategies	.51	4.48%	2
Repetition and revision	.52	4.15%	2
Sensory memory strategies	.44	4.07%	2

#### **4.1.1.5 Results of CFA for the nine-factor model**

The new 9-factor solution of SILL model was evaluated through a CFA using a maximum likelihood estimation. The goodness of fit statistics for the 9-factor model indicated a more adequate model fit with the Estonian data than the original 2- or 6-factor models. The CFI still remained below .90 (CFI=.896), and the RMSEA reached .055 which is indicating an acceptable error. The  $\chi^2$  statistic for the model normalised by a degree of freedom stayed below 3.0 (CMIN/DF=2.025). Compared to the original 2- and 6-fold models, the model fit indices of the 9-fold solution were better. However, it could not be considered acceptable enough which led us to search a more solid factor structure.

#### **4.1.1.6 Discussion**

In this study we sought to investigate whether SILL, translated and adapted for Estonian EFL learners, reflected two-, six- or nine-factor classification, and compare the results with other similar studies conducted in different cultures.

The results revealed that the exploratory factor analysis used to test Oxford's 2-factor and 6-factor taxonomy of SILL did not provide a fully acceptable fit to the data. This has been explained with high correlations among the constructs (Park, 2011). The 9-fold analysis provided factors relevant for comparison with the results of the study conducted by Oxford and Burry-Stock (1995) on Puerto Rico, Taiwan, China, Japan, Egypt and the US. The factor structure of Estonian research has most overlappings with Puerto Rico and PR China; the least with Taiwan and Japan (Table 8).

The findings could be interpreted in the light of language teaching traditions. The language teaching methodology has changed a lot over time. During the Soviet period, the grammar-translation method was mainly used. Due to its behaviouristic theoretical base – habit formation via repetition and reinforcement – it supported using mostly memory and cognitive strategies. Developing analytical skills was not encouraged, which led to metacognitive strategies being underexploited. As the grammar-translation method does not support developing active language use, people felt tense and nervous when they had to communicate in English. At present, the situation outside schools has changed a lot – borders are open, there is a tremendous information explosion and people have many opportunities to use the language – and that is one of the reasons why young people are highly motivated to learn English. This has led to the change in the use of LLS – the role of social and compensation strategies has grown and metacognitive strategies are accruing gradually.

The study was limited by the uneven sample. Not all respondents were active EFL learners at the moment of questioning – some students had participated in EFL courses some time ago; some were currently learning. That may have affected the reliability of students' reporting on their learning strategies to a small extent, but certainly not so much that it influenced the overall results as, when studying at the tertiary level, students are still expected to work currently with English study materials and articles. This will lead us to the second limitation, which was the lack of opportunity to check the validity of the instrument related to language proficiency. Comparing the results according to language proficiency would have given a better picture in the comparison with other similar studies. Thirdly, as measuring language proficiency was not included in the study, it was not possible to assess the efficiency of strategy use but only the frequency of strategy use. The last two limitations were addressed in Study II.

Despite these limitations, the study contributed to clarification of the factor model of LLS. Having many overlaps with the 9-factor model described by Oxford and Burry-Stock (1995), it provided good material for comparison with similar studies conducted before. But, although we considered it reasonable to

continue gathering similar data to have comparison basis with different countries and shed light on cultural and regional features, it also turned out to be necessary to reinvestigate and restructure the existing taxonomy as many studies have reported its unacceptable fit (Park, 2011).

#### **4.1.2 Study II – Validating SILL and testing its predictive validity**

The aim of Study II was to find out which is the most solid factor structure of SILL, translated and adapted for Estonian EFL learners, and how are the language learning strategies related to the learning outcomes. To answer these questions the following quantitative analyses were conducted: EFA, reliability analysis, descriptive statistics, CFA and SEM.

##### ***4.1.2.1 Results of EFA for a new model of SILL***

For exploratory factor analysis principal components method with oblique rotation (Direct Oblimin) was employed. The number of factors was not fixed but according to the Kaiser rule of eigenvalue, a 6-factor solution could be expected. After multiple cleaning from the items with low loadings (< 0.5), a 6-factor solution (Table 10) with the variance of 68% was received. The new version was renamed Est-SILL as it described the Estonian EFL learners' strategy use.

The new scale of Est-SILL had 17 items instead of 50 original ones (Appendix 2). The factors that formed were **active language use**, these are the strategies which express learner-initiated activities of using the language in situations close to real life, and are the combination of Oxford's cognitive, social and metacognitive strategies. **Metacognitive strategies** express planning, monitoring and evaluating learning activities; **social strategies** are used for asking for and offering help in the learning process; **compensation strategies** are used for overcoming gaps in knowledge of the language; **memory strategies** express mnemonic techniques to memorise and retrieve information, and **connecting strategies** are used for activating the information that is already known and relating it with new information. No affective strategies were included in the final solution. As it is known that affective strategies are predominantly used by beginners (Oxford, 1990), their exclusion with the sample who had learned English for more than 10 years, was not unexpected.

**Table 10.** The factor loadings and variance ( $R^2$ ) of the items of Est-SILL

Item	Loading	$R^2$
<i>Active language use</i>		
1. (49S) I ask questions in SL	.83	.73
2. (14C) I start conversations in the SL	.78	.64
3. (30MC) I try to find as many ways as I can to use my SL	.56	.64
4. (11C) I try to talk like native SL speakers	.55	.54
<i>Metacognition</i>		
5. (38MC) I think about my progress in learning SL	.84	.72
6. (34MC) I plan my schedule so I will have enough time to study SL	.82	.68
7. (33MC) I try to find out how to be a better learner of SL	.73	.63
8. (37MC) I have clear goals for improving my SL skills	.72	.71
<i>Social strategies</i>		
9. (45S) If I do not understand something in SL, I ask the other person to slow down or say it again	.79	.65
10. (48S) I ask for help from SL speakers	.76	.68
11. (46S) I ask SL speakers to correct me when I talk	.75	.65
<i>Compensation strategies</i>		
12. (24CM) To understand unfamiliar SL words, I make guesses	.83	.64
13. (25CM) When I can't think of a word during a conversation in the SL, I use gestures	.75	.74
<i>Memory strategies</i>		
14. (6M) I use flashcards to remember new SL words	.86	.75
15. (7M) I physically act out new SL words	.85	.78
<i>Connecting strategies</i>		
16. (2M) I use new SL words in a sentence so I can remember them	.81	.68
17. (1M) I think of relationships between what I already know and new things I learn in the SL	.73	.67

Notes: The numbers of the original SILL items (see Appendix 1) are given in brackets along with their original grouping: M = Memory strategies, C = Cognitive strategies, CM = Compensation strategies, MC = Metacognitive strategies and S = Social strategies.

#### 4.1.2.2 Results of reliability analysis

The new solution had six factors with 17 items. Four out of the six new factors had  $\alpha$  coefficients above the acceptable level of .60 (Nunnally & Bernstein, 1994), confirming that the items within each strategy groups measured similar characteristics. Only compensation and connecting strategy groups did not reach this criterion, with .51 and .59 respectively (Table 11). This might have been caused by a small number of items ( $n=2$ ) that formed these strategy groups.

**Table 11.** Reliability and variance of the factors of Est-SILL

Strategy groups	Cronbach's $\alpha$	Variance	Number of items
Active language use	.75	27.6%	4
Metacognitive strategies	.82	10.7%	4
Social strategies	.72	9.2%	3
Compensation strategies	.51	8.3%	2
Memory strategies	.68	6.8%	2
Connecting strategies	.59	5.2%	2

Even though the smallest acceptable number of items in a factor is three (Tabachnick & Fidell, 2007), two-item factors were also accepted in the current solution. When compiling factors, the content of the items and theories were considered in the first place, and then mathematical analysis. Also, in the case of measurement model a two-item factor is identifiable, if the factor loadings of the items are more or less equal (Kenny et al, 1998). This requirement was fulfilled in the case of all two-item factors. Besides, these factor loadings were rather high, staying between .73 and .86 (Table 10). Another indicator referring to a two-item factor being reliable, is a high correlation between the variables ( $r > .70$ ) (Yong & Pearce, 2013). In the case of the current two-item factors the correlation coefficients remained between .61 and .69 which was rather marginal but still strong enough. The most important reason to accept the model was the fact that the model as a whole was identifiable and the model fit indices were rather high (see Chapter 4.1.2.4).

The construct validity which was estimated throughout the studies revealed consistency of some subgroups with other instruments (connecting strategies and metacognition in MSLQ, and planning, monitoring and evaluating in SRL-SRS) (see also Table 5). Also, the good model fit indices of the factor analysis confirm good construct validity.

#### 4.1.2.3 Descriptive statistics

The respondents assessed their use of language learning strategies on a five-point Likert-type scale where 1 stood for *Never or almost never true of me*, and 5 – *Always or almost always true of me*. If we investigated the students' strategy use in the newly-formed scale (Table 12), we could see that social strategies and compensation strategies distinguished with the highest frequency, whereas memory strategies were with lowest. This finding was rather expectable as memory strategies are mostly used by beginners but this sample consisted of people who had learned English for 10 and more years on account of which they can be considered advanced language learners.

**Table 12.** Descriptive statistics on strategy use ( $N = 269$ )

Strategy groups	Mean	SD	Skewness	Kurtosis
Social strategies	3.73	1.07	-0.69	-0.06
Compensation strategies	3.53	0.88	-0.21	-0.41
Active language use	3.44	0.93	-0.14	-0.61
Metacognitive strategies	3.40	1.05	-0.37	-0.45
Connecting strategies	3.30	0.77	-0.24	0.19
Memory strategies	1.45	0.71	2.01	4.88

The item with the highest mean was a metacognitive strategy – *I try to find out how to be a better learner of SL* ( $M=4.19$ ;  $SD=0.96$ ). This was followed by social strategies – *If I do not understand something in SL, I ask the other person to slow down or say it again* ( $M=3.99$ ;  $SD=1.02$ ) and *I ask for help from SL speakers* ( $M=3.69$ ;  $SD=1.16$ ), and a compensation strategy – *To understand unfamiliar SL words, I make guesses* ( $M=3.63$ ;  $SD=1.03$ ). The strategies with the least frequency belonged to the group of memory strategies – *I use flashcards to remember new SL words* ( $M=1.42$ ;  $SD=0.79$ ), *I physically act out new SL words* ( $M=1.47$ ;  $SD=0.82$ ), and a metacognitive strategy – *I plan my schedule so I will have enough time to study SL* ( $M=2.62$ ;  $SD=1.04$ ). 13 items out of 17 of the Est-SILL had the average value over 3 (on scale 1–5), only four items had this value below three.

#### **4.1.2.4 Results of CFA for the new model of SILL**

The modified and re-specified 17-item Est-SILL was evaluated through CFA using a maximum likelihood method. The goodness of fit statistics for the model were acceptable: the chi-square statistic normalised by degrees of freedom did not exceed 3.0 ( $\chi^2 = 201,405$ ;  $df = 103$ ;  $CMIN/DF = 1.96$ ), CFI was 0.92 and RMSEA was 0.06 which were both within the acceptable criteria range (Brown, 2006).

#### **4.1.2.5 Results of SEM for predictive validity**

The language learners' use of learning strategies and their relations with learning outcomes was analysed with structural equation modelling (SEM). Drawn on theory, three alternative models were created: unitary, hierarchical and mediated-hierarchical. The unitary model (Figure 6) was based on the assumption that all six strategy groups contribute to the outcomes of language competencies directly. In the case of hierarchical model (Figure 7) the four language competencies (writing, listening, reading and speaking) were drawn together into one latent variable. The third, mediated-hierarchical model (Figure 8) was based on the theory that certain strategies do not contribute to learning

outcomes directly but indirectly through other strategies. When creating this model the correlation coefficients of the strategy groups were taken into consideration.

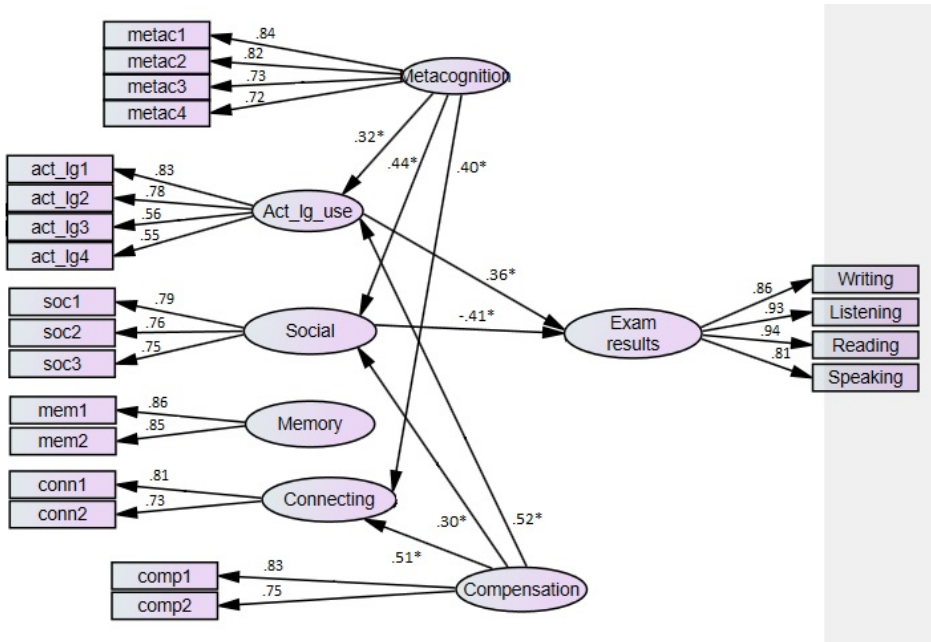
As it can be seen in Table 13, all three models fit to data well.

**Table 13.** Indicators of model fit based on SEM

	$\chi^2$	df	CMIN/DF	CFI	RMSEA
Unitary model	257.620	152	1.70	0.95	0.05
Hierarchical model	304.764	168	1.81	0.94	0.06
Mediated-hierarchical model	326.959	177	1.84	0.96	0.04

Although the model fit indices for the all models were equally good, considering the theoretical background and the correlation coefficients of strategies and learning outcomes, we proceeded with the analysis of the mediated-hierarchical model. First of all, the relations of strategy groups and learning outcomes, and their direct and indirect effects were focused on.

In the course of analysis it appeared that active language use strategies had the strongest positive direct effect on learning outcomes (Figure 13). The effect of social strategies on learning outcomes was direct but negative. It means that the less social strategies were used in the learning situation, the better were the corresponding results in the state exam. The effects of memory and connecting strategies were not statistically significant.



**Figure 13.** Standardized direct effects of learning strategies

Indirect effects on learning outcomes were revealed in the use of metacognitive and compensation strategies. While the effects of metacognitive strategies were negative in the case of learning outcomes, the effects of compensation strategies were positive. However, none of these effects were statistically significant.

To understand what the indirect effects of metacognitive and compensation strategies on learning outcomes really mean, it was observed which the effects of these strategies on other strategy groups were. It appeared that compensation strategies had a significant direct positive effect on active language use, social and connecting strategies (Figure 13). Metacognitive strategies also had a significant positive effect on these 3 strategy groups – active language use, social and connecting strategies. The possible argumentation on the direct and indirect effects will be given below.

#### **4.1.2.6 Discussion and limitations**

The aim of the study was to test the validity of different taxonomies of language learning strategies based on empirical data, and to analyse the potential correlation of the LLS and learning outcomes with the sample of final-grade students. The results indicated that the data collected from the students reflected the structure that had overlappings with the taxonomies of Oxford (1990), Cohen (1996; 2014), and O'Malley and Chamot (1990). The new model, Est-SILL, had 17 items instead of original 50 ones. The model comprised six factors, four of them – metacognition, social, compensation and memory strategies – overlapped, at least in part, with the original model of SILL, while two factors – active language use and connecting strategies – reflected new groups. The new group of active language use strategies reflected learner-initiated activities of using the language in situations close to real life. The strategies that made up this group came from cognitive, social and metacognitive strategy groups of SILL. The elements converging there resembled three out of four subsets of Cohen's language *use* strategies (retrieval, rehearsal and communication). Whereas, the communication strategies described by Cohen were the activities with the focus on getting a message across, had the biggest overlap with the new subscale of active language use. According to Cohen, such strategies may or may not have impact on learning (1996) but they reflect the learners' deliberate intention to participate actively in communication. The emergence of the factor of active language use is directly related to the theory of communicative language learning. Although this approach has not been used in Estonian schools for a long time, the learners seemed to have adopted it well and willingly used the strategies of active language use. The fast acceptance of this approach has also been supported by the diversity of communication channels which enables face-to-face and online communication, and this way supports the development of the learners' language competence. The indication that the strategies of active language use were the strongest and most frequently used allows to conclude that language learning does not take place in the classroom only but has become an inseparable part of youngsters' everyday life and communication.



The second new group – connecting strategies – reflected learners' activities in relating new information with what they already know. Even though the items comprising this group initially derived from the memory category in SILL, they had more in common with the cognitive strategies of 'elaboration' and 'transfer' described by O'Malley and Chamot (1990) as, respectively, 'relating new information to prior knowledge, relating different parts of new information to each other, or making meaningful personal associations with the new information' and 'using what is already known about language to assist comprehension or production'. They also had similar characteristics with Cohen's retrieval strategies which help to remember when and how any language structures to use (2014).

The Est-SILL grouping of social strategies was formed from only three items of the six from the original SILL social strategy group. The elements, which clearly focused on seeking help in communicative situations, overlapped more with O'Malley and Chamot's (1990) socio-affective strategy of 'questioning for clarification' – defined as 'eliciting from a teacher or peer additional explanation, rephrasing, examples or verification', – than with Oxford's broader social category. In Cohen's (2014) taxonomy, communication strategies describe similar activities in the language learning as well as language using situations.

Metacognitive strategy group retained four original items from SILL, basically focusing on learner's personal aspirations to support his/her language learning activities. According to Oxford, these are the strategies which help learners to arrange and plan their language learning in an efficient, effective way (1990). One of the Oxford's metacognitive strategies – *I try to find as many ways as I can to use my SL* – was repositioned in the active language use grouping. The other strategies which were left out from the new subscales were about centering one's learning and self-monitoring.

Compensation strategies in the original SILL cover two aspects – guessing intelligently and overcoming limitations (Oxford 1990). The two items which reached the Est-SILL solution were on guessing and using gestures. The last one was unexpected to certain extent as Estonians being rather reserved and modest in communication usually do not use gestures. Cohen described his coping strategies as the ones which help to overcome gaps in knowledge using alternative ways (2014). O'Malley and Chamot, however, took a step further and explained inferencing as a strategy to compensate one's gaps (1990).

The list of memory strategies in the original SILL comprises four subdivisions: creating mental linkages, applying images and sounds, reviewing well, and employing action (Oxford 1990). The only two activities forming the memory grouping in the Est-SILL expressed learners' use of imagery and physical response for memorising new words. These memory strategies have common characteristics with Cohen's memorising and retrieval strategies (2014), and O'Malley and Chamot's imagery strategies (1990), both referring to learner's activities to implement different memory techniques.

It is also interesting to note that no affective strategies were represented in the final model of Est-SILL. It might be caused by the circumstance that

affective strategies are attributed to beginning language learners. The current sample had been learning English for approximately 10 years, and therefore can be considered upper-intermediate or even advanced learners. Also, the students who study together in a safe and comfortable environment, surrounded by friends, classmates and a familiar teacher, probably do not need to use affective strategies so much.

Next, the learners' use of LLS was analysed in relation with the results of English state exam which was written two months later. In order to find relations between the perceived strategy use and learning outcomes, three models were designed – unitary, hierarchical and mediated-hierarchical – which were tested with structural equation modelling analysis. Although all three models revealed acceptable model fit indices, we proceeded with the mediated-hierarchical one as this model drew on the theoretical knowledge about the connections and mutual effects of cognitive and metacognitive learning strategies (Phakiti, 2003; Purpura, 1997; Zhang et al, 2014). As the correlation coefficients did not reveal statistically significant relations between metacognitive and compensation strategies and learning outcomes, it was important to investigate their direct and indirect effects on learning outcomes as well as other strategy groups.

Similarly to the studies of Purpura (1997), and Zhang and his colleagues (2014), it appeared that cognitive (active language use) and social strategies contributed directly to learning outcomes. The active language use strategies which basically converge the learner-initiated activities and are the best example of communicative approach, are the basis of language proficiency. The more the learners can be supported to implement these strategies, the better results they achieve in their language studies. While the effects of active language use on learning outcomes were positive, the effects of social strategies were negative. The social strategies included in the Est-SILL were basically directed to help seeking and using peer help. Help seeking strategies are predominantly applied by the learners who may not be as skillful as their peers. To keep up with others, they may need peers' help. Therefore, applying these strategies in the learning situation may not benefit to the test results.

Although theories refer to the importance of metacognitive strategies in acquiring language proficiency (Benson, 2011; O'Malley & Chamot, 2002; Phakiti, 2003), several studies have indicated (i.e Purpura, 1997) that metacognitive strategies do not contribute directly to the learning outcomes but indirectly through cognitive strategies. As the correlation coefficients revealed in the current analysis allowed to presume indirect effects also in the case of compensation strategies, it was investigated in more detail how these two strategy groups, metacognitive and compensation, acted in the context of learning outcomes and other strategy groups. Compensation strategies had indirect positive effect on learning outcomes. But the indirect effects of metacognitive strategies were negative. To better comprehend indirect effects and the mediating strategy groups, we focused on investigating the direct effects of metacognitive and compensation strategies. Both strategy groups revealed significant positive effects on cognitive and social strategies. In other words, the

learner's skillful metacognitive activity enables him/her to implement social strategies more efficiently when he/she needs to assess the necessity of asking for help from peers and using peer help. Conscious use of compensation strategies supports learner's active language use and applying connecting strategies, and through this achieve positive learning outcomes. Hence, metacognitive strategies which are generally considered to be important in the learning process and support the learner development, do not seem to impact directly on test results. It can rather be stated that the skills of using metacognitive learning strategies support learners' more efficient use of cognitive and social strategies in the learning process which in turn impacts the results of state exam.

The findings described above came unexpected in some respects as according to the results of PISA test (see i.e Mikk et al, 2012), a bigger impact of metacognitive strategies was expected on learning outcomes. Even though the results of English state exam have been comparatively high throughout the years [2011 – 72.0; 2012 – 68.6; 2013 – 72.0; 2014 – 67.5 (Kriisa, 2014)], they do not seem to be related to learners' use of metacognitive strategies in the learning process. As the current study did not give an unequivocal explanation, it may be discussed whether the efficiency of language acquisition is influenced mostly by the strategies of active language use, or whether the tasks of the state exam have been compiled this way that they measure specific knowledge and skills, and do not assume using metacognitive strategies to apply them. To have a more profound understanding of the dynamics of learning outcomes and their connections with learning strategies used in the learning process, it would be necessary to investigate the state exam preparation process as well as language learners' test-taking strategy use.

In conclusion, it can be said that the current study contributed to language learning in two ways. First, it provided a valid self-report questionnaire Est-SILL to measure the learners' LLS in the Estonian language. Due to its good validity indicators and a smaller number of items (17 instead of 50) the instrument could successfully be applied also with other language learners. Its structure that somewhat differs from the original structure of SILL, reflects the multidimensional nature and associations of LLS. Further studies could test whether this shorter form of the instrument of SILL could also be applicable in other cultures and whether its factor structure could be valid with different samples. At the same time, the study confirmed the complicity of classifying LLS. Similarly to many international studies, the strategy group of active language use, which proved to be the strongest predictor of learning outcomes, distinguished among other strategies. Second, the study revealed the role of LLS in learning outcomes. The study confirmed the direct effect of cognitive strategies on test results, but the effect of metacognitive strategies was indirect and needs further research with the learning process and test-taking strategies. The results of the research can be implemented in language studies and teacher training directing learners' and teachers' attention to teaching the most efficient LLS to students in order to achieve better results in language learning.

### 4.2.1 Study III – Testing the efficiency of the first design of the LLS and SRL intervention in the blended course of Professional English

The aim of Phase 1 of the study was to test the efficiency of the design principles that support students’ LLS and SRL, and students’ perceptions of the learning process with the developed intervention.

#### 4.2.1.1 Changes in learners’ use of language learning strategies, self-regulation and content knowledge

In order to investigate the changes in the use of LLS, self-regulation and content knowledge, we compared the pre- and post-test mean scores in the domain of Professional English. To estimate the frequency of students’ use of LLS, we conducted a paired-samples t-test to compare the means of all six strategy groups of the pre- and post-test. The results are reported in Table 14. The results show a significant improvement in the scores for social strategies pre-test (M=3.68, SD=0.93) and post-test (M=4.15, SD=0.66);  $t(27)=-3.60$ ,  $p=0.001$ . The change in learners’ use of social strategies remained statistically significant also after applying Bonferroni correction ( $p<0.008$ ). The other strategy groups did not reveal significant changes in learners’ use of language learning strategies.

**Table 14.** Differences between students’ (N=28) LLS in pre- and post-tests (scale 1–5) (Phase 1)

	Pre-test M(SD)	Post-test M(SD)	t	df	p
Active language use	3.32(0.73)	3.37(0.68)	-0.34	27	0.739
Metacognition	3.78(0.65)	3.71(0.76)	0.48	27	0.632
Social strategies	3.68(0.93)	4.15(0.66)	-3.60	27	<b>0.001</b>
Compensation strategies	3.84(0.73)	4.11(0.80)	-1.86	27	0.074
Memory strategies	1.68(0.87)	1.84(0.90)	-0.86	27	0.398
Connecting strategies	3.38(0.62)	3.55(0.52)	-1.51	27	0.143

*Note: Statistically significant results given in bold.*

The changes in learners self-regulation are reported in Table 15. The only two subdivisions in the motivation scale that revealed statistically significant change were external motivation and control of learning beliefs. While students’ external motivation decreased by the time of post-test [ $t(27)= 3.77$ ,  $p=0.001$ ], their control of learning beliefs increased significantly [ $t(27)=-3.63$ ,  $p=0.001$ ]. These changes remained statistically significant also after applying Bonferroni correction ( $p<0.008$ ). In the strategies scale, however, the only significant

difference which appeared in effort regulation [ $t(27)=-2.78$ ,  $p=0.009$ ], did not remain significant when Bonferroni correction was applied ( $p<0.007$ ).

**Table 15.** Differences between students' (N=28) self-regulation in pre- and post-tests (scale 1–7) (Phase 1)

	Pre-test M(SD)	Post-test M(SD)	t	df	p
<i>MSLQ motivation</i>					
Intrinsic motivation	4.82(0.79)	5.00(0.93)	-1.17	27	0.252
External motivation	5.26(0.98)	4.45(1.18)	3.77	27	<b>0.001</b>
Task value	5.81(0.63)	5.84(0.75)	-0.39	27	0.702
Control of learning beliefs	5.71(1.02)	6.32(0.72)	-3.63	27	<b>0.001</b>
Self-efficacy	4.52(0.86)	4.46(1.01)	0.42	27	0.675
Test anxiety	4.16(1.43)	3.91(1.48)	1.60	27	0.121
<i>MSLQ strategies</i>					
Rehearsal	4.15(0.96)	3.90(0.93)	1.31	27	0.201
Organisation	3.10(1.15)	2.99(1.06)	0.50	27	0.618
Connecting strategies	4.17(0.98)	4.25(0.75)	-0.52	27	0.604
Effort regulation	2.87(0.82)	3.41(1.32)	-2.78	27	0.009
Metacognitive SR	4.17(1.08)	4.00(1.12)	0.69	27	0.496
Time and learning environment	5.10(0.95)	4.97(0.96)	0.83	27	0.413
Peer-learning	4.70(1.01)	4.57(0.95)	0.70	27	0.491

Note: Statistically significant results given in **bold**.

The change in learners' content knowledge was remarkable in the comparison of pre-test (M=39.54, SD=12.59) and post-test (M=76.19, SD=9.78),  $t(27)=-14.49$ ,  $p=0.001$ .

These results indicate that the developed assignments promoted the usage of only social strategies and control of learning beliefs. In order to advance the use of metacognitive strategies, it appeared that students needed additional support.

#### 4.2.1.2 Students' perceptions of the learning process

Group interviews were conducted to collect data about students' perceptions of language learning following the four assignments given (see the interview questions in Appendix 5). Most students admitted that it had been difficult for them to set goals for the entire course as well as for certain assignments, partly because they had no experience in this area. However, students who had some experience with setting learning goals considered it a natural activity (“*Having done it before, you already know what you want and what you need*”). The same can be said about working in pairs. Students who had experience working

with others were better at planning and regulating their tasks when working in pairs. Earlier experience enabled them to discuss and negotiate the process with their partner and to plan their work more efficiently (*"I enjoyed pair work because, thanks to my secondary school experience, I knew how to do it"*). These results seem to indicate that students' prior experience related to the assignments had an influence on their learning activities. Students without relevant experience might have had difficulties carrying out the required tasks in this current research study and may have required more support.

Pair work was considered the most motivating and useful type of assignment, mostly because of the real-life aspects of the task engaging with authentic materials relevant to their field of study in tourism. They were able to practice and experience the potential role of a future tourism service specialist. These tasks were also approved because of the learning strategies they facilitated – pair work, negotiating, compromising, responsibility, and so on. However, a couple of students admitted that occasionally they would have preferred to do the tasks individually (*"If your partner wasn't really motivated and interested in it, it was very difficult to work with her"*). This shows that although students considered collaborative learning assignments very valuable, some students also experienced problems that have been widely reported in previous studies (see e.g. Leijen et al, 2008; Lockhorst, 2004).

The students were asked about the cognitive strategies they used throughout different assignments; the variety of strategies they use daily turned out to be quite limited. There are certain strategies they use for learning vocabulary or working with a new text. At the same time, the students do not feel the necessity to expand the variety of strategies, believing that they can manage with the existing ones (*"My learning habits are mostly already shaped, but I think I still developed a little bit more as a learner"*). However, students seem to be aware of their learning styles, and they use the strategies suitable for these consciously. When students were asked how they assessed their own work in the context of the course, they admitted that such assessment was very difficult for them, as they tended to be more tolerant of their own mistakes. Their peers' mistakes were easier for them to notice. On the other hand, it was difficult for students to point to their peers' mistakes and criticize their performance (*"You don't want to hurt your friend, but there is no point in beautifying the situation"*). Students also appreciated a fuller development of their language skills, which was assessed throughout the course, and not simply individual language mistakes they happened to make in their utterances. The assessment criteria added to each assignment helped to clarify what was expected of them, along with the result they were expected to achieve (*"It is easier to plan your work if you know what is assessed"*). Students considered the course successful if they received a good grade, but they also valued a good inner feeling about it. A month after the end of the course, many of the students admitted that they could have worked harder (*"It wasn't actually a difficult course; I could have learned much more there"*). These findings illustrate that students are not used to monitoring their learning process. Promoting these methods could also take

longer and require further support. Evidence suggests that through specially designed learning assignments, it is possible to lead students through the process step-by-step and help them to notice and realize the importance of certain strategies to enhance their learning process.

#### **4.2.1.3 Relationship between strategy use and content knowledge**

In order to investigate the relationship between the strategy use and content knowledge, we conducted a Pearson correlation analysis between the scores of the LLS scales, motivation and strategy scales, and the results of the students' content knowledge test (all measures collected in the post-test). The only significant correlation was found between connecting strategies (MSLQ strategies) and content knowledge:  $r=.472$ ,  $p<.05$ , indicating an average correlation between the two measures. The possible explanations will be given below.

The other strategy groups did not significantly correlate with the content knowledge, which could have been influenced by the relatively small sample. However, we also expected the metacognitive strategies to correlate with the content knowledge, as these connections have been found in previous studies (O'Malley et al, 1985; Ehrman & Oxford, 1995; Green & Oxford, 1995), and the development of current assignments also considered these factors. In the interview several students admitted that the strategies applied in secondary school were not helpful in the Professional English course, as the tasks and expectations were rather different (*"We needed to analyze the texts and discuss them in our course; we never did that in the secondary school"*). However, students admitted that they enjoyed the different approach to language learning and felt that learning a language this way gave them a more adequate feeling of authentic language use. These findings indicate again that although students might value advanced LLS and assignments that promote their development, promoting such activities might take longer and require further support.

#### **4.2.1.4 Discussion and limitations**

The study showed some evidence concerning the effectiveness of enhancing students' advanced LLS and self-regulation with the support of learning assignments within a personal learning environment. The results of the t-test revealed statistically significant changes only in social strategies (*Est-SILL*), external motivation and control of learning beliefs (*MSLQ motivation scale*), and effort regulation (*MSLQ strategies*). Social strategies are considered an inseparable part of language learning in a communicative language class. The assignments were developed with the aim of supporting students' active and natural use of language by working with authentic materials and solving real-life problems. The elements that converged to the group of social strategies focus on seeking help in communicative situations. They are basically used for questioning for clarification, and eliciting from a teacher or peers additional

explanations, rephrasing or verification (O'Malley & Chamot, 1990, p. 199). While completing the assignments, especially pairworks, students were expected to collaborate. The tasks which were new for them, and assumed implementing different skills and knowledge, required substantial collaboration and joint efforts from the learners which in turn caused the growth of the use of social strategies.

Control of learning refers to learners' beliefs that their efforts while learning will result in positive outcomes. It is about the belief that the learning outcomes are contingent on the learner's own effort, in contrast to external factors. If a learner believes that his/her efforts make a difference, he/she should be more likely to study strategically and effectively (Pintrich et al, 1991). The elements of control of learning beliefs in the adapted version of MSLQ express the learners' perceived responsibility for their learning activities ("*It is my own fault if I don't learn the material in this course*", and "*If I don't understand the course material, it is because I didn't try hard enough*"). The course which was very voluminous in its content and comprised the assignments which presumed learners' independent and collaborative work, made learners feel higher responsibility for their learning outcomes. Also, the understanding of the first-year students who belonged to the sample that in the university the learning process is different compared to the secondary school, and the responsibility for its efficiency lies on learners themselves. This recognition was supported by the change in effort regulation that also reflected the increase in learners' understanding of self-discipline and their own responsibility [i.e "*When course work is difficult, I give up or only study the easy parts*" (analysed in the reversed way)]. Effort management is self-management which reflects commitment to completing the study goals even in the case of difficulties or distractions. Effort management is important for academic success as it regulates the use of learning strategies (Pintrich et al, 1991). And finally, external motivation was the fourth factor revealing a significant change as a result of the intervention, but this change was opposite. Extrinsic motivation or extrinsic goal orientation shows how much the learner perceives himself/herself to be participating in the task for external reasons like grades, rewards, evaluation by others and competition (Ibid). The significant fall of the means in external motivation and a slight increase in intrinsic motivation also refer to the learners' growing awareness of their responsibility in the learning process, and recognition of the discipline as a necessary one for their future career. However, this recognition was not reflected in the metacognition factor which refers to conscious activities within the learning process. The limited use of cognitive and metacognitive strategies may indicate the inadequate awareness of learners' own strategy use (Chamot, 1998), which also became evident with the interview answers in the current study. Although the use of metacognitive strategies was expected throughout the course, it appeared, based on the results of the t-tests and focus group interviews, that these skills need deeper enhancement through planning, monitoring, and evaluating phases.



Students' perceptions of the developed learning assignments were varied and depended upon their previous learning experiences. Planning the learning activities for the course and evaluating them based on expectations outlined in the learning plan (Task 1) was a new approach for most of the students. It caused difficulties, as they could not yet think ahead or plan their learning. However, self-assessment within the course became a more familiar activity, as this had to be done regularly following all tasks. Writing an essay (Task 3) caused neither difficulties nor excitement, as students were used to receiving such assignments in the secondary school. The pair work (Tasks 2, 4) was the most time-consuming and assumed a lot of individual work as well as teamwork. The students who had practised and worked in pairs before were better at managing their time, negotiating, and collaboration strategies. There were the students who, despite being able to motivate their less interested partners, would have preferred to do the tasks individually. However, the majority of the students still enjoyed doing the tasks.

In the relationship between the language learning strategies, self-regulation and content knowledge, connecting strategies (*MSLQ strategies*) stood out as the only strategies being related to learning outcomes. The connecting strategies in the current adapted version of the MSLQ were made of elaboration and critical thinking strategies of Pintrich (1991). They were the learner activities which reflected relating new knowledge with material learned previously or in other classes (i.e. *I try to relate ideas in this subject to those in other courses whenever possible*), looking for alternatives (i.e. *Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives*), and developing new ideas (i.e. *I treat the course material as a starting point and try to develop my own ideas about it*). The positive moderate correlation coefficient with learning outcomes refers to the ability of more successful learners to see the "big picture" and use their knowledge gained in other courses to support their language studies.

Despite the interesting findings, there were some potential limitations in the study. The first limitation was the relatively small sample of 28 people. This also entailed the need to repeat the study expanding the sample and enhancing the intervention, especially the cognitive and metacognitive aspects. Another limitation was the web-based learning environment which in spite of being exciting and challenging for learners, led to confusion and misunderstandings in some cases. Therefore, replacing the personal learning environment with a learning management system with a highly organised structure and the possibility to track learners' activities was considered. Despite the obvious shortcomings, the results of the study were considered valuable, since it indicated the strategy groups which were the easiest to be supported. On the other hand, it showed unlike the earlier results (Liaw & Huang, 2013) that designing the intervention and specific learning assignments was not enough to enhance learners' self-regulation. In order to become more self-regulated, the learners have to be taught to use specific techniques, and to make them use them, they have to be supported throughout the learning process.

## 4.2.2 Study IV – Testing the efficiency of the second design of the LLS and SRL intervention enhanced with prompts

Proceeding from the results of Phase 1 (described in Chapter 4.2.1), the following changes and improvements were made in Phase 2. First, the web-based learning environment which was in EduFeedr in Phase 1, was changed for the learning management system Moodle in Phase 2. This change was made because of the critical remarks made by students in the interviews and learning diaries. The criticism concerned the structure of the environment, poor navigation between the blogs and feed aggregator, and the diffusion of resources. Compared to EduFeedr, the Moodle environment is more structured and better organised enabling learners to find all necessary resources easily and upload their works in the same environment. The second improvement made in Phase 2 was based on theoretical knowledge (see i.e Berthold et al, 2007; Brunstein & Glaser, 2011) on reinforcement the intervention to support learners' strategy use (for more information see Chapter 3.2.4.2).

### 4.2.2.1 Changes in learners' use of language learning strategies, self-regulation and content knowledge

In order to answer the research question on the changes in the use of LLS, self-regulation and content knowledge, we compared the pre- and post-test mean scores. To estimate the frequency of students' use of LLS, we conducted a paired-samples t-test to compare the means of all six strategy groups of the pre- and post-test. The results are reported in Table 16. The table shows a significant difference in the scores for all advanced strategy groups. The only strategies which did not make through a significant improvement was memory strategies. This was also an expected finding as memory strategies are basically used by beginning language learners but the students who belonged to this sample had been learning English for more than ten years. All these changes but the ones of connecting strategies remained statistically significant also after applying Bonferroni correction ( $p < 0.008$ ).

**Table 16.** Differences between students' (N=28) language learning strategies in pre- and post-tests (scale 1–5) (Phase 2)

	Pre-test M(SD)	Post-test M(SD)	t	df	p
Active language use	3.25(0.75)	3.94(0.61)	-4.93	27	<b>0.001</b>
Metacognition	3.69(0.67)	4.08(0.71)	-2.89	27	<b>0.007</b>
Social strategies	3.65(0.64)	4.07(0.74)	-3.07	27	<b>0.005</b>
Compensation strategies	3.77(0.81)	4.23(0.69)	-3.69	27	<b>0.001</b>
Memory strategies	1.57(0.56)	1.86(0.86)	-1.89	27	0.069
Connecting strategies	3.29(0.84)	3.73(0.89)	-2.29	27	0.030

Note: Statistically significant results given in **bold**.

These findings indicate that the learning assignments enhanced with prompts to support learners' cognitive and metacognitive strategies, promote learners' use of more advanced LLS. The use of compensation strategies and active language use strategies increased most which can be explained with communicative language approach, many communication tasks in the class, and the possibility to express their ideas orally as well as in written form.

The changes in learners self-regulation based on MSLQ are reported in Table 17. The two subdivisions in the motivation scale that revealed statistically significant change were intrinsic motivation [ $t(27)=-2.32, p=0.028$ ] and control of learning beliefs [ $t(27)=-2.57, p=0.016$ ]. However, these changes did not remain statistically significant after applying Bonferroni correction ( $p<0.008$ ). In the strategies scale, significant difference appeared in rehearsal [ $t(27)=-2.91, p=0.007$ ], connecting strategies [ $t(27)=-2.43, p=0.022$ ], effort regulation [ $t(27)=-2.79, p=0.009$ ] and metacognitive self-regulation [ $t(27)=-2.91, p=0.007$ ]. After applying Bonferroni correction ( $p<0.007$ ) only rehearsal and metacognitive self-regulation remained significant.

**Table 17.** Differences between students' (N=28) self-regulation in pre- and post-tests (scale 1–7) (Phase 2)

	Pre-test M(SD)	Post-test M(SD)	t	df	p
<i>MSLQ motivation</i>					
Intrinsic motivation	5.14(1.0)	5.51(0.88)	-2.32	27	0.028
External motivation	4.99(1.15)	5.05(1.35)	-0.36	27	0.720
Task value	5.86(0.67)	5.85(0.72)	0.04	27	0.972
Control of learning beliefs	5.59(1.20)	6.06(0.77)	-2.57	27	0.016
Self-efficacy	4.86(1.09)	4.78(0.92)	0.51	27	0.612
Test anxiety	4.01(1.42)	3.96(1.40)	0.22	27	0.829
<i>MSLQ strategies</i>					
Rehearsal	4.62(0.89)	5.08(0.81)	-2.91	27	<b>0.007</b>
Organisation	3.43(1.20)	3.69(1.20)	-1.04	27	0.307
Connecting strategies	4.58(0.79)	4.89(0.88)	-2.43	27	0.022
Effort regulation	2.88(0.98)	3.44(1.18)	-2.79	27	0.009
Metacognitive SR	4.45(0.92)	5.0(0.87)	-2.91	27	<b>0.007</b>
Time and learning environment	5.07(1.11)	4.50(0.93)	0.47	27	0.641
Peer-learning	4.36(1.29)	4.66(1.16)	-1.99	27	0.055

Note: Statistically significant results given in **bold**.

Using the third instrument, SRL-SRS (Toering et al, 2012) enabled to investigate the change in learners' use of metacognitive strategies in more detail as this instrument treats the subconstructs of metacognition – planning, monitoring and

evaluating – separately. The results of the t-test showed that the intervention had supported learners’ planning and evaluating strategies most, but not monitoring.

The changes in learners’ use of metacognitive strategies measured with SRL-SRS are reported in Table 18. The three subdivisions that revealed statistically significant change were planning [t (27)=-2.25, p=0.033], evaluating [t (27)=-2.07, p=0.048] and effort regulation [t (27)=-2.11, p=0.045]. However, none of these changes remained statistically significant after applying Bonferroni correction (p<0.008).

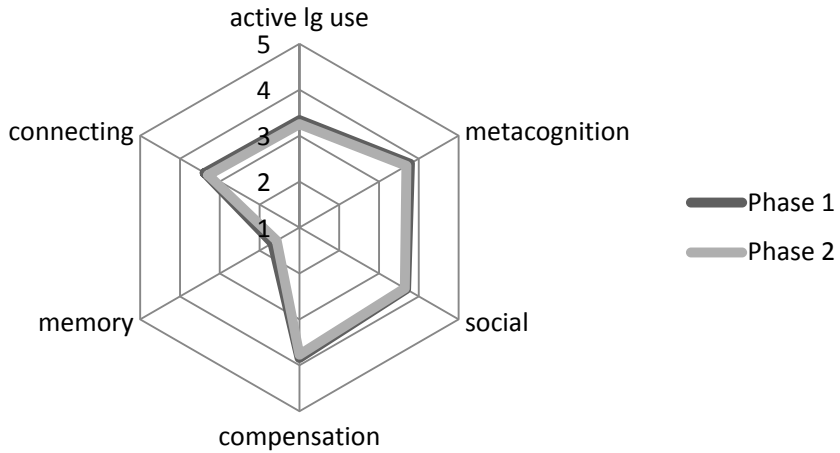
**Table 18.** Differences between students’ (N=28) metacognitive strategies in pre- and post-tests (scale 1–5) (Phase 2)

	Pre-test M(SD)	Post-test M(SD)	t	df	p
<i>SRL-SRS</i>					
Planning	2.77 (1.0)	3.05 (0.93)	-2.25	27	0.033
Monitoring	3.48 (0.45)	3.48 (0.74)	-0.05	27	0.962
Evaluating	3.90 (0.56)	4.1 (0.59)	-2.07	27	0.048
Time-planning	3.28 (0.55)	3.27 (0.85)	0.06	27	0.954
Effort regulation	3.36 (0.47)	3.62 (0.83)	-2.11	27	0.045
Self-efficacy	3.62 (0.48)	3.79 (0.63)	-1.85	27	0.075

Although the factor of metacognitive SR (MSLQ strategies) revealed a significant improvement, the change of individual metacognitive activities of planning, monitoring and evaluating (SRL-SRS) was not significant after applying Bonferroni correction.

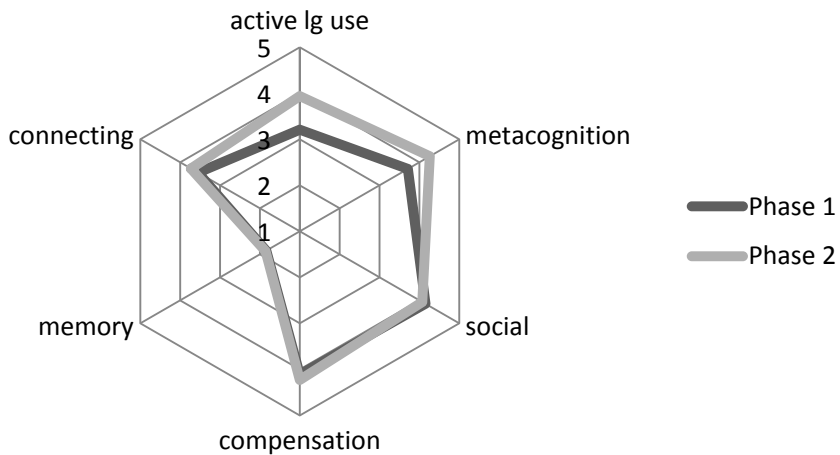
The change in learners’ content knowledge was remarkable in the comparison of pre-test (M=29.57, SD=16.27) and post-test (M=71.64, SD=11.02), t (27)=-16.86, p=0.001.

When the changes in learners’ LLS use were compared on the basis of Phase 1 and Phase 2, it appeared that while the pre-tests did not reveal any significant differences between the samples of Phase 1 and Phase 2 (Figure 14), the post-tests revealed significant differences in two strategy groups (Figure 15).



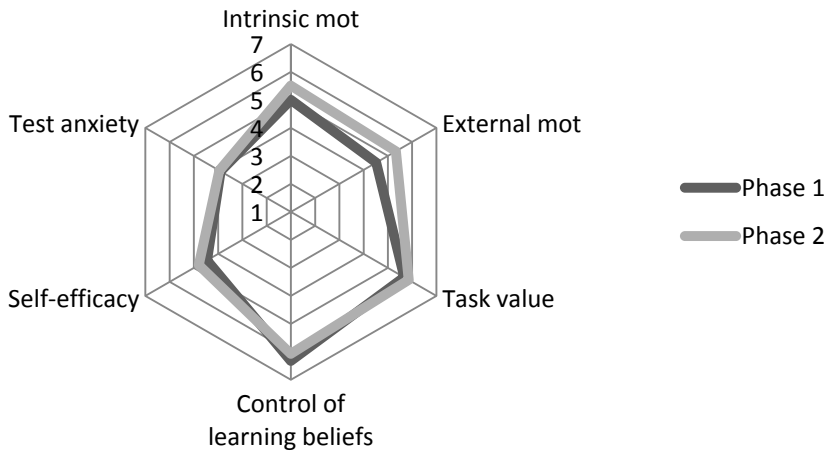
**Figure 14.** Differences between LLS use in Phase 1 and Phase 2 based on pre-tests

The use of active language use strategies was significantly bigger [ $t(54)=-3.96$ ,  $p=0.001$ ] when the indicators of Phase 1 ( $M=3.21$ ,  $SD=0.74$ ) were compared to Phase 2 ( $M=3.94$ ,  $SD=0.61$ ). The difference for metacognitive strategies was slightly smaller, however statistically significant:  $t(54)=-3.12$ ,  $p=0.003$ , the indicators of Phase 1 ( $M=3.71$ ,  $SD=0.77$ ) and Phase 2 ( $M=4.26$ ,  $SD=0.53$ ) respectively.



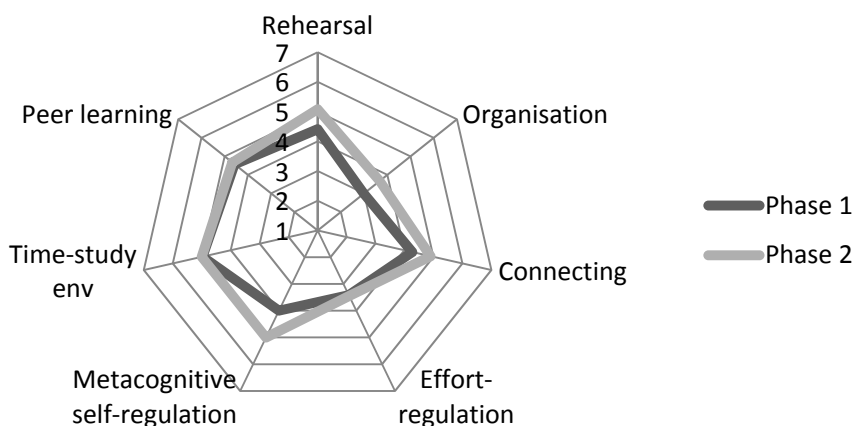
**Figure 15.** Differences between LLS use in Phase 1 and Phase 2 based on post-tests

The same can be said about the change in learners' self-regulation. While there were no significant differences in the pre-tests of Phase 1 and Phase 2, the post-tests revealed statistically significant differences in intrinsic motivation [ $M=5.0$ ,  $SD=0.93$  (Phase 1),  $M=5.51$ ,  $SD=0.9$  (Phase 2),  $t(54)=-2.09$ ,  $p=0.041$ ] and external motivation [ $M=4.52$ ,  $SD=1.19$  (Phase 1),  $M=5.33$ ,  $SD=0.98$  (Phase 2),  $t(54)=-2.76$ ,  $p=0.008$ ] (Figure 16).



**Figure 16.** Differences of the motivation scale (MSLQ) in Phase 1 and Phase 2 based on post-tests

The strategy scale revealed significant differences for rehearsal [ $M=4.41$ ,  $SD=1.10$  (Phase 1),  $M=5.08$ ,  $SD=0.83$  (Phase 2),  $t(54)=-2.57$ ,  $p=0.013$ ], connecting strategies [ $M=4.27$ ,  $SD=0.74$  (Phase 1),  $M=4.9$ ,  $SD=0.89$  (Phase 2),  $t(54)=-2.85$ ,  $p=0.006$ ], organisation [ $M=2.99$ ,  $SD=1.06$  (Phase 1),  $M=3.66$ ,  $SD=1.22$  (Phase 2),  $t(54)=-2.22$ ,  $p=0.03$ ] and metacognitive self-regulation [ $M=4.0$ ,  $SD=1.12$  (Phase 1),  $M=5.0$ ,  $SD=0.88$  (Phase 2),  $t(54)=-3.69$ ,  $p=0.001$ ] (Figure 17).



**Figure 17.** Differences of the strategy scale (MSLQ) in Phase 1 and Phase 2 based on post-tests

These results indicate that the developed assignments with prompts supporting cognitive and metacognitive learning strategies contribute to acquisition of skills and knowledge related to the discipline, and advance learners self-expression in English. There was a clear evidence on it in the tasks where students were expected to define the tourism-related terms, compare and contrast different tourism objects and activities, and compile a response to the letter of complaint. The combined tasks in the content knowledge test demonstrated the learners' ability to apply the new knowledge and skills, and express them orally.

#### **4.2.2.2 Students' perceptions of the learning process**

Focus group interviews were carried out to collect data on students' perceptions of the language course following the designed assignments and supporting prompts. Similarly to the interviews in Phase 1, the general impression, perceptions of learning assignments and problem areas were investigated. In addition, questions about the three phases of self-regulation – planning, monitoring and evaluating, and using prompts were asked (see the interview questions in Appendix 5).

Most students admitted that in general they were satisfied with the course and their own performance. As their previous language learning experience at school had been different in some respects, it took a while to get used to new approach, different requirements and the amount of material that had to be acquired in a short period of time. Students became more confident due to the friendly atmosphere and supportive feedback (*"I found out my weaknesses and*

*discovered what and how I should advance*”). The first assignment, compiling the learning plan, caused rather contrary opinions. There were students who had practised it at school, and they considered it a self-explanatory start for a course (*“It’s the same when you start a new task, you first think how you will do this, how you will plan your time...”*). Other people did not think it was necessary to put it all down if they thought on these things anyway. The prevalent opinion was that long-term processes needed more planning and preparing than minor tasks.

Having the learning process supported with prompts was a new experience for all students. They admitted using the prompts regularly saying that these had been very beneficial (*“They were especially good when starting a new task, they helped to get going. Especially when you weren’t really sure what and how to do”*). It was also said that they helped to get the feel of the teacher (*“You’ll find out what she considers important, what she evaluates”*). It was also stated that the prompts added to the reading texts and supporting learners’ cognitive strategies were even more useful as they facilitated reading comprehension.

One topic that was asked about in the interview was on regulating students’ learning activities. Several students shared the opinion that as the course and the topics were interesting, they were more motivated to explore and read extra materials. While planning was a natural part of their learning activities, then monitoring tended to be confusing (*“When you’re finishing your work, then you think how you were doing anyway”*). They also said that it was difficult for them to reflect their performance and self-evaluate their work because they were not just used to it. Another problem which came up in several answers was lack of time and poor time-planning skills (*“You just try to get used to the whole university thing, here are so many new things you have to do and remember, and you cannot even understand everything right away. It may be really confusing first”*).

The students were also asked how they felt about the learning assignments designed for this course. Their almost unanimous opinion was that the pairworks (Tasks 2 and 4) had been most interesting as well as educating and enjoyable. The students valued the possibility to make presentations in the class and listen to their coursemates, also search information, and cooperate with their partner (*“The pairwork taught to work together, and consider the others’ opinions”*). They liked that they could choose the topic and destination, having a lot of freedom when organising their work and preparing their presentation. However, the essay writing was not the most appealing experience for them (*“The topic we were given wasn’t too interesting, we could have chosen ourselves what to write about”*). However, the feedback they were given on their essays and the way how they could correct and improve their texts was considered most beneficial (*“Correcting your text on the basis of clues was interesting and useful, you had to detect yourself what was wrong and how to correct it”*).

The students were asked about the cognitive strategies they used while doing different assignments. Several students admitted that they had established the



learning strategies that they used throughout the learning process – using flashcards, inferring the meaning of new words, underlining, making notes etc. They also said that sometimes it was difficult to memorise all new material, the loads of new information were big and they had no time to process and memorise it. But the best ways to learn foreign languages were watching films, reading books and communicating. This recognition also supports the result we got when investigating learners' LLS.

When students were asked how they assessed their own work in the context of the course, they admitted that their performance depended on time they had (*"If you have enough time, then you can elaborate your work and will be more satisfied with the result"*). Self-assessment was one of the hardest tasks for them. They tended to be very critical about their own performance and then they might lose confidence. Students evaluated assessment criteria added to all assignments highly (*"Then you know what is assessed and how"*, *"It also made it easier to understand your mistakes and the way your grade was formed"*). However, giving feedback to peers, as well as receiving it, was difficult. The students had not practised it before and were afraid to insult their friends. Several students said that they did not really mind what their final grade of the course was, as long as it was passed. The inner satisfaction was guaranteed when the learner knew that he/she had made an effort and had gained a lot of useful knowledge. They evaluated practical knowledge and skills that could be used in the future, in their professional career.

When the students were asked to describe themselves as learners, many of them said that they were independent learners who directed their own learning process and learned best individually. In this context the pairwork was said to be impeding, the results might depend too much on the partner, his/her motivation and dedication. Several students admitted that the course had provided them with new skills – time-planning, bigger independence and responsibility, bigger efficiency. On the other hand, the pairwork assignments disciplined them, too (*"Even if you don't feel like working, you feel responsible for your partner. You can't let him down"*).

These findings illustrate that the biggest difficulties for students were still monitoring and evaluating their learning process. Even if they understood how it supported them, they felt uncomfortable and unconfident. However, the students were able to analyse themselves as learners and recognise their strengths and weaknesses. Promoting the methods which support learners' self-regulated learning strategies help to lead students through the independent, self-regulated learning process and help them to notice and realize the importance of certain strategies to enhance their learning process.

#### **4.2.2.3 Relationship between strategy use and content knowledge**

In order to investigate the relations between the learners' strategy use and learning outcomes, we conducted a Pearson correlation analysis between the scores of the LLS scales of Est-SILL, motivation and strategy scales of MSLQ, self-regulation scales of SRL-SRS, and the results of the students' content knowledge test (all measures collected in the post-test). Unlike the findings in Phase 1, the only significant correlation was found between control of learning beliefs (*MSLQ motivation*) and content knowledge:  $r=.390$ ,  $p<.05$ , indicating an average correlation between the two measures.

The other strategy groups did not significantly correlate with the content knowledge. However, we also expected the metacognitive strategies to correlate with the content knowledge, as these connections have been found in previous studies (O'Malley et al, 1995; Ehrman & Oxford, 1985; Green & Oxford, 1995), and the development of current assignments and support also considered these factors. But similarly to the findings in Study II (Chapter 4.1.2) the metacognitive strategies did not contribute to the learning outcomes. Whether they could affect the outcomes indirectly, needs further investigations. Another explanation is that metacognitive strategies contribute to the learning process, and test-taking success depends on other strategies (Cohen, 2006).

#### **4.2.2.4 Discussion and limitations**

Similarly to the study of Nash-Ditzeli (2010) on supporting learners' reading strategies and self-regulation, the current study also showed a significant improvement to the use of LLS supported with prompts. The analysis of LLS revealed positive results in the case of all advanced strategies. The biggest changes, which took place in the groups of active language use, compensation and social strategies, can be explained with the use of communicative language approach and the learning assignments that assumed active communication and self-expression orally as well as in written form. The only strategy group which did not reveal a significant change was memory strategies. This was highly expected as according to theory (O'Malley & Chamot, 2002; Oxford, 1990), memory strategies are predominantly used by beginners. In advancement of language studies, the proportion of using memory strategies diminishes and is replaced by other, more advanced strategies. This, in turn, supports advancing learners' self-regulated learning strategies (Oxford & Crookall, 1989) which in the current study was expressed in a significant increase in metacognitive strategies. Considering the sample of the current study who were the first-year students, having learned English for approximately 10.4 years and whose English was rather good based on the state exam results ( $M=75.14$  points out of 100), especially compared to the average of all learners who wrote the exam (67.5 points), the improvement to their advanced LLS (i.e active language use, social, metacognitive, compensation and social strategies) to such extent was expected.

The results of the t-test of the motivation scale (MSLQ) were positive on internal motivation and control of learning beliefs. Both are considered important to predict positive learning outcomes (Khatib, 2010). Even though the learning assignments designed for the intervention had been planned in detail, the students still had a possibility to decide several nuances. This gave them a possibility to participate in adjusting the learning process according to their needs and expectations, and at the same time retained their learning motivation. The t-test of MSLQ strategy scale revealed the improvement to strategies in four groups. Similarly to the connecting strategies measured with Est-SILL, the connecting strategies gave a positive result also in MSLQ. While in language studies the connecting strategies are related to the combined use of language knowledge, the same construct in MSLQ focuses on learner's general knowledge and world-view. Considering the fact that the studies of Professional English are based on the previously acquired knowledge of general English language, it is of utmost importance to activate and make use of knowledge acquired beforehand, connect new material with previously learned material, and create new knowledge on this basis (Conteh-Morgan, 2002). The skills of activating prior knowledge and connecting it are also necessary in the phase of planning when we speak about learner's self-regulation (Pintrich, 2000). Similarly to the results of Nash-Ditzel (2010), we can also speak about the improvement to cognitive learning strategies enhanced with prompts. The significant improvement to cognitive or rehearsal strategies speaks about skillful completion of regular learning assignments. These strategies signify the learner's ability to work independently with study materials, revise the materials studied before, and find information to complete the course materials.

The learning assignments that were designed for this course and included prompts for planning, monitoring and evaluating activities, focused basically on supporting learners' cognitive and metacognitive learning strategies. The results of t-tests revealed the increase in metacognitive strategies in the measurements of Est-SILL and MSLQ. When we considered the subconstructs of metacognition – planning, monitoring and evaluating – separately in the measure of SRL-SRS, it appeared that the extent of using strategies did not improve. Unlike several other studies that focused on self-regulated activities and their support, and where the improvement of these strategies was shown (e.g Kramarski & Gutman, 2006; Mäeots, 2014), similar changes could not be detected in the current study. However, similarly to the study of Azevedo (2005), the current findings of metacognitive self-regulation confirmed that using prompts gave better results on supporting learning strategies when they were used simultaneously in the class situation and in the web environment, and when the relevant activities were repeated throughout the learning process.

As it became evident in the studies of Kramarski and Michalsky (2010), Kauffman and his colleagues (2011) and many other researchers, the current results suggest that the growth of the use of cognitive and metacognitive strategies might have brought along the growth of content knowledge. The results of the content test, which improved most compared to all other variables,

refer to the circumstance that the designed assignments with prompts on the use of cognitive and metacognitive strategies supported the advancement of content knowledge. Thus, it can be concluded similarly to Kramarski and Michalsky (2009), Quintana and his colleagues (2005), Pedaste (2006) and many others that using prompts supporting cognitive and metacognitive strategies is one way to improve learning outcomes.

In conclusion it might be said that the combined support of cognitive and metacognitive strategies suggested in earlier studies (e.g Berthold et al, 2007; Brunstein & Glaser, 2011) using prompts (Kramarski & Michalsky, 2009; Lee et al, 2010a) gave positive results in the current case when developing LLS, self-regulation and content knowledge. Further studies should focus on supporting separate metacognitive activities in the learning process duplicated in the web environment as well as in the classroom. Also, in addition to using prompts, strategy instruction to enhance metacognitive self-regulation should be considered.

## 5. CONCLUSIONS AND IMPLICATIONS

### 5.1 Conclusions

Many researchers have stated that self-regulation is difficult to teach. The aim of the current dissertation was to demonstrate that development of learners' self-regulation can be supported if an efficient intervention is applied. According to the best knowledge of the author, there is no model to support learners' self-regulation and effective learning strategies been developed in the domain of Professional English. Therefore, the current research focused on creating the intervention to support learners' cognitive and metacognitive learning processes and testing it. When designing the intervention the results of prior similar studies were considered (e.g Brunstein & Glaser, 2011; Kramarski & Michalsky, 2010; Lee et al, 2010a).

The two main goals of the current dissertation were (1) to compile and validate a reliable instrument for measuring Estonian EFL learners' language learning strategies and (2) to design and evaluate an efficient intervention to support language learners' self-regulation and language learning strategies. The main conclusions from the studies are as follows:

#### **Part I – Language learning strategies**

RQ1. *Which factor structure does SILL (Strategy Inventory for Language Learning) translated and adapted for Estonian EFL learners, reflect?*

- Though the main division of LLS in the original SILL is direct and indirect strategies, the solution of the current factor analysis did not reveal similar division. Therefore, it cannot be stated that the language learning strategies of SILL translated and adapted for Estonian EFL learners divided into direct and indirect strategies.
- Drawn on the original division of LLS into six strategy groups, the solution of factor analysis was not acceptable. This means that the original division of LLS (Oxford, 1990) was not valid for Estonian EFL learners.
- The 9-factor solution which gave results similar to many early factor analyses revealed new factors like active language use and sensory memory strategies. It also revealed several overlappings with the results of similar studies in America, Asia and Africa. However, because of the non-acceptable model fit indices the 9-factor solution of LLS could not be considered valid, either. Therefore, a more sound factor structure had to be looked for considering different theoretical approaches.
- The factor solution which best described the Estonian EFL learners' strategy use was 6-fold and comprised the factors similar to the divisions of Oxford (1990), Cohen (1996), and O'Malley and Chamot (1990).

- The factors which best characterised young adults' use of LLS, are active language use, metacognition, social strategies, compensation strategies, memory strategies and connecting strategies.
- Affective strategies were not exploited by advanced learners in regular school settings.

RQ2. *How is the use of language learning strategies related to the learning outcomes in language studies?*

- Cognitive learning strategies had a direct effect on learning outcomes.
- Active language use strategies comprising learner-initiated activities of using the language in situations close to real life, and having the strongest positive effect on learning outcomes, were most important to be supported in the language classrooms. Also, the learning activities related to free use of language outside the class enhanced active language use strategies.
- Metacognitive strategies had no direct effect on learning outcomes. Their indirect effect on outcomes was not significant. However, metacognitive strategies affected learners' use of active language use, social and connecting strategies.

## **Part II – Supporting cognitive and metacognitive strategies**

RQ3. *Which design principles are important for developing the intervention that supports students' language learning strategy use and self-regulated learning strategies in the domain of language studies?*

- The learning environment and learning assignments alone did not assure the improvement of learners' strategy use. To make the difference it was necessary to guide learners to plan, monitor, and evaluate their learning activities. This in turn, assumed enhancing the intervention and offering learners more efficient support.
- The learning environment and designed assignments which were enhanced with prompts supported significantly the improvement of learners' strategy use and content knowledge. However, to facilitate learners' strategy use even further, strategy instruction should be incorporated in language studies.

RQ4. *How do the learners' use of language learning strategies, self-regulation and content knowledge change as a result of the interventions embedding cognitive and metacognitive support?*

- The intervention with four learning assignments specifically designed to support learners' use of LLS and self-regulation was not enough to improve learner's use of cognitive and metacognitive strategies sufficiently. The only strategy groups that revealed significant improvement were social strategies

and control of learning beliefs. The change of learners' external motivation revealed significant decrease.

- The similar intervention enhanced with **prompts** to support learners' use of LLS and self-regulation was more efficient and improved learner's use of cognitive and metacognitive strategies. The LLS that revealed significant improvement were active language use, metacognitive, social and compensation strategies. Also, the changes of learners' rehearsal strategies and metacognitive self-regulation revealed significant increase. However, the scales measuring the components of metacognition – planning, monitoring and evaluating – separately, did not reveal a significant improvement. This refers to the necessity of an even more thorough metacognitive strategy instruction than prompting provided.
- The learners' content knowledge improved significantly as a result of the intervention with and without prompt-enhancement.

*RQ5. How did learners perceive the learning process and the development of their language skills and self-regulation as a result of the developed intervention?*

- Students with prior experience of controlling their learning process and doing pairwork were better at performing the course assignments. The students agreed that long-term processes needed more planning and preparing than minor tasks. Planning activities were considered natural in the learning process, however, monitoring and reflecting their activities stayed confusing for many learners. To support students' monitoring and reflecting activities more attention should be paid to it in the classroom. However, evaluating their performance was new and unhabitual for students. Also, peer-assessment caused inconvenience in the learning process.
- Students approved the assignments designed for the course as they were interesting and motivating, and encouraged them to search material and do extra work. The pairwork assignments were evaluated highest because of the real-life aspects engaged. They also facilitated the students' collaborative learning strategies. Students appreciated an undivided development of language skills, formative assessment and feedback which was provided throughout the learning process. The learners evaluated the prompts added to assignments as they helped them to keep on track and perform the assignments more successfully.
- The students quite adequately analysed themselves as learners and recognised their strengths and weaknesses. They admitted that their regular learning strategies were sufficient to cope with the learning assignments, and they did not really feel the necessity to implement any new strategies.

## 5.2 Implications

The current study provides implications with respect to future research and practice in teacher education and university pedagogy.

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### **Part I Scientific implications**

- The factor structure of the original SILL, its reliability and validity have been questioned by many researchers (Park, 2011; Rose, 2012; Article I; Woodrow, 2005). The structure in its original form was not valid for Estonian grown-up EFL learners either, therefore, it is not an advisable instrument to use with Estonian learners.
- Unlike the original SILL (Oxford, 1990), Est-SILL revealed a solid 6-fold factor structure which characterises the Estonian EFL learners' use of language learning strategies. In the taxonomy of Est-SILL the strategies of Oxford (1990), Cohen (1996; 2014), and O'Malley and Chamot (1990) are engaged. The good model fit indices of Est-SILL make it a valid and reliable instrument for measuring Estonian EFL learners' LLS.
- Unlike e.g PISA test (Mikk et al, 2012), the validity study of Est-SILL did not indicate the relations of metacognitive strategies and learning outcomes. The indirect effects that metacognitive strategies have on outcomes should be further investigated distinguishing the strategies used in the learning process and the ones in the test-taking situation. Also, the examination task types and the students' preparation process for the state exam should be considered.

### **Practical implications**

- Est-SILL is a valid and reliable instrument for measuring Estonian EFL learners strategy use. A deeper insight into language learners' strategy use enables to support their language studies and achieve higher proficiency.
  - A fuller understanding of the relations of LLS and learning outcomes enables to implement the knowledge in university pedagogy to facilitate language studies and in teacher education to train language teachers.
  - In order to support language learners to achieve better results in standardised language tests, their use of cognitive strategies, especially active language use strategies should be enhanced.
- 

### **Part II Scientific implications**

- Unlike the research results of Liaw and Huang (2013), the learning environment and the learning assignments alone did not have an effect on learners' use of more advanced learning strategies or self-regulation. In order to cause an improvement a more efficient intervention enhanced with prompts was needed.
- Similarly to Winters and colleagues (2008), it can be stated that the prompts need to be used regularly and repetitively throughout the learning process, in the classroom, in individual and pair- or teamwork.

### **Practical implications**

- In language studies more attention should be paid to developing learners' cognitive and metacognitive strategies through practical, close to real-life learning assignments that are enhanced with prompts to self-regulate.
  - In teacher education student-teachers should be explained the importance of self-regulation in the learning process. They should be encouraged to pay more attention to supporting their students' cognitive and metacognitive learning strategies.
-



## APPENDICES

### Appendix 1. Strategy Inventory for Language Learning (SILL) by Oxford (1990)

This form of the strategy inventory for language learning (SILL) is for students of a foreign language. Please read each statement and fill in the bubble of the response (1, 2, 3, 4, or 5) that tells HOW TRUE THE STATEMENT IS.

1. Never or almost never true of me
2. Usually not true of me
3. Somewhat true of me
4. Usually true of me
5. Always or almost always true of me

Answer in terms of how well the statement describes you. Do not answer how you think you should be, or what other people do. **There are no right or wrong answers** to these statements.

<b>Part A</b>		<b>Score</b>				
1	I think of relationships between what I already know and new things I learn in the SL	1	2	3	4	5
2	I use new SL words in a sentence so I can remember them	1	2	3	4	5
3	I connect the sound of a new SL word and an image or picture of the word to help me remember the word	1	2	3	4	5
4	I remember a new SL word by making a mental picture of a situation in which the word might be used	1	2	3	4	5
5	I use rhymes to remember new SL words	1	2	3	4	5
6	I use flashcards to remember new SL words	1	2	3	4	5
7	I physically act out new SL words	1	2	3	4	5
8	I review SL lessons often	1	2	3	4	5
9	I remember new SL words or phrases by remembering their location on the page, on the board, or on a street sign	1	2	3	4	5
<b>Part B</b>		<b>Score</b>				
10	I say or write new SL words several times	1	2	3	4	5
11	I try to talk like native SL speakers	1	2	3	4	5
12	I practice the sounds of SL	1	2	3	4	5
13	I use the SL words I know in different ways	1	2	3	4	5
14	I start conversations in the SL	1	2	3	4	5
15	I watch SL language TV shows spoken in SL or go to movies spoken in SL	1	2	3	4	5

<b>Part A</b>		<b>Score</b>				
16	I read for pleasure in the SL	1	2	3	4	5
17	I write notes, messages, letters, or reports in the SL	1	2	3	4	5
18	I first skim an SL passage (read over the passage quickly) then go back and read carefully	1	2	3	4	5
19	I look for words in my own language that are similar to new words in the SL	1	2	3	4	5
20	I try to find patterns in the SL	1	2	3	4	5
21	I find the meaning of an SL word by dividing it into parts that I understand	1	2	3	4	5
22	I try not to translate word for word	1	2	3	4	5
23	I make summaries of information that I hear or read in the SL	1	2	3	4	5
<b>Part C</b>		<b>Score</b>				
24	To understand unfamiliar SL words, I make guesses	1	2	3	4	5
25	When I can't think of a word during a conversation in the SL, I use gestures	1	2	3	4	5
26	I make up new words if I do not know the right ones in the SL	1	2	3	4	5
27	I read SL without looking up every new word	1	2	3	4	5
28	I try to guess what the other person will say next in the SL	1	2	3	4	5
29	If I can't think of an SL word, I use a word or phrase that means the same thing	1	2	3	4	5
<b>Part D</b>		<b>Score</b>				
30	I try to find as many ways as I can to use my SL	1	2	3	4	5
31	I notice my SL mistakes and use that information to help me do better	1	2	3	4	5
32	I pay attention when someone is speaking SL	1	2	3	4	5
33	I try to find out how to be a better learner of SL	1	2	3	4	5
34	I plan my schedule so I will have enough time to study SL	1	2	3	4	5
35	I look for people I can talk to in SL	1	2	3	4	5
36	I look for opportunities to read as much as possible in SL	1	2	3	4	5
37	I have clear goals for improving my SL skills	1	2	3	4	5
38	I think about my progress in learning SL	1	2	3	4	5
<b>Part E</b>		<b>Score</b>				
39	I try to relax whenever I feel afraid of using SL	1	2	3	4	5
40	I encourage myself to speak SL even when I am afraid of making a mistake	1	2	3	4	5
41	I give myself a reward or treat when I do well in SL	1	2	3	4	5

<b>Part A</b>		<b>Score</b>				
42	I notice if I am tense or nervous when I am studying or using SL	1	2	3	4	5
43	I write down my feelings in a language learning diary	1	2	3	4	5
44	I talk to someone else about how I feel when I am learning SL	1	2	3	4	5
<b>Part F</b>		<b>Score</b>				
45	If I do not understand something in SL, I ask the other person to slow down or say it again	1	2	3	4	5
46	I ask SL speakers to correct me when I talk	1	2	3	4	5
47	I practice SL with other students	1	2	3	4	5
48	I ask for help from SL speakers	1	2	3	4	5
49	I ask questions in SL	1	2	3	4	5
50	I try to learn about the culture of SL speakers	1	2	3	4	5

## Appendix 2. Est-SILL in the Estonian language.

### Keeleõppestrateegiate loend Est-SILL

Käesolev eesti õppijate jaoks kohandatud keeleõppestrateegiate loend (Est-SILL) on loodud mõõtmaks võõrkeele õppijate keeleõppe strateegiaid. Loe läbi iga väide, meenuta kuidas Sa õpid/õppisid inglise vm. võõrkeelt, ja tee ring sobiva vastusevariandi ümber vastavalt sellele, KUI ÕIGE SEE VÄIDE SINU PUHUL ON.

1. Mitte kunagi või peaaegu mitte kunagi õige
2. Tavaliselt ei ole õige
3. Mõneti õige
4. Tavaliselt õige
5. Alati või peaaegu alati õige

Vali vastuse variant vastavalt sellele, kui hästi see väide peab Sinu puhul paika. Ära vasta selle põhjal, kuidas Sa arvad, et võiks olla või mida teised inimesed teevad. Neile väidetele **pole õigeid ega valesid vastuseid.**

		Punktid				
		1	2	3	4	5
1	Ma esitan küsimusi võõrkeeles.	1	2	3	4	5
2	Ma alustan vestlust võõrkeeles.	1	2	3	4	5
3	Ma püüan leida võimalikult palju võimalusi võõrkeele kasutamiseks.	1	2	3	4	5
4	Ma püüan rääkida nagu seda võõrkeelt emakeelena kõneleja.	1	2	3	4	5
5	Ma mõtlen oma võõrkeele õpingute edenemise peale.	1	2	3	4	5
6	Ma planeerin oma tegevust, et mul oleks piisavalt aega võõrkeelt õppida.	1	2	3	4	5
7	Ma püüan saada paremaks võõrkeele õppijaks.	1	2	3	4	5
8	Mul on selged eesmärgid oma võõrkeele oskuse parandamiseks.	1	2	3	4	5
9	Kui ma ei saa millestki võõrkeeles aru, siis ma palun inimesel rääkida aeglasemalt või palun tal seda korrata.	1	2	3	4	5
10	Ma palun vajadusel võõrkeeles kõnevalt inimeselt abi.	1	2	3	4	5
11	Ma palun võõrkeeles kõneleval inimesel end parandada, kui ma teen vigu.	1	2	3	4	5
12	Mõistmaks uusi võõrkeelseid sõnu, püüan ma tähendust ära arvata.	1	2	3	4	5
13	Kui mul ei tule vestluse ajal vajalik sõna meelde, kasutan ma žeste.	1	2	3	4	5
14	Ma kasutan uute võõrkeelsete sõnade meeldejätmiseks sõnakaarte.	1	2	3	4	5
15	Ma kasutan võõrkeelsete sõnade meeldejätmiseks liigutusi.	1	2	3	4	5
16	Ma kasutan lauses uusi võõrkeelseid sõnu, et neid paremini meelde jätta.	1	2	3	4	5
17	Ma mõtlen varem õpitu ja uute asjade vahelistele seostele.	1	2	3	4	5

**Appendix 3.** The Estonian adapted and validated version of Motivated Scale for Learning Questionnaire (MSLQ) by Pintrich (1991)

**Osa A. Motivatsioon**

Järgnevate küsimustega uuritakse Sinu motivatsiooni ja suhtumist sellesse kursusesse. **Pea meeles, et ei ole õigeid ega valesid vastuseid, lihtsalt vasta nii täpselt kui võimalik.** Küsimustele vastamiseks kasuta allolevat skaalat. Kui arvad, et väide on Sinu kohta väga õige, siis tee ring ümber 7, kui ei ole Sinu kohta üldse õige, tee ring ümber numbrile 1. Kui väide on Sinu kohta enam-vähem õige, siis leia number 1 ja 7 vahel, mis Sind kõige paremini iseloomustab.

		1	2	3	4	5	6	7
	(ei ole üldse minu puhul õige)							(minu puhul väga õige)
1	Kursusel nagu see, eelistan materjali, mis esitab mulle tõelise väljakutse uute asjade õppimiseks.	1	2	3	4	5	6	7
2	Kontrolltööd tehes mõtlen sellest, kui kehvasti mul võrreldes teiste üliõpilastega läheb.	1	2	3	4	5	6	7
3	Arvan, et saan sellel kursusel õpitut kasutada ka teistel kursustel.	1	2	3	4	5	6	7
4	Usun, et saan sellel kursusel suurepärase hinde.	1	2	3	4	5	6	7
5	Olen kindel, et saan aru ka kõige raskematest selle kursuse tekstidest.	1	2	3	4	5	6	7
6	Sellel kursusel hea hinde saamine on minu jaoks käesoleval hetkel kõige rahulduspakkuvam.	1	2	3	4	5	6	7
7	Kui teen kontrolltööd, siis mõtlen testi teistest osadest, mida ma teha ei oska.	1	2	3	4	5	6	7
8	See on minu oma süü, kui ma ei õpi selgeks selle kursuse materjali.	1	2	3	4	5	6	7
9	Minu jaoks on tähtis selle kursuse materjal selgeks õppida.	1	2	3	4	5	6	7
10	Praegu on minu jaoks kõige tähtsam üldise keskmise hinde parandamine, seega minu eesmärk sellel kursusel on saada hea hinne.	1	2	3	4	5	6	7
11	Võimalusel tahan sellel kursusel teistest üliõpilastest paremaid hindeid saada.	1	2	3	4	5	6	7
12	Kui teen kontrolltööd, siis mõtlen läbikukkumise tagajärgedele.	1	2	3	4	5	6	7
13	Olen kindel, et saan aru ka kõige keerulisemast materjalist, mida selle kursuse õppejõud esitab.	1	2	3	4	5	6	7

14	Kursusel nagu see, eelistan kursuse materjali, mis tekitab minus uudishimu, isegi kui seda on raske õppida.	1	2	3	4	5	6	7
15	Olen selle kursuse sisust väga huvitatud.	1	2	3	4	5	6	7
16	Kui teen eksamit, olen rahutu ja häiritud.	1	2	3	4	5	6	7
17	Olen kindel, et saan selle kursuse ülesannete ja testidega suurepäraselt hakkama.	1	2	3	4	5	6	7
18	Eeldan, et saan sellel kursusel hästi hakkama.	1	2	3	4	5	6	7
19	Mulle pakub sellel kursusel suurt rahuldust püüda mõista õpetatava sisu nii põhjalikult kui võimalik.	1	2	3	4	5	6	7
20	Arvan, et selle kursuse materjal on kasulik ära õppida.	1	2	3	4	5	6	7
21	Kui mul on sellel kursusel võimalus, siis valin ülesanded, millest ma midagi õpin, isegi kui need ei taga mulle head hinnet.	1	2	3	4	5	6	7
22	Kui ma ei saa kursuse materjalist aru, siis seetõttu, et ma ei pingutanud piisavalt.	1	2	3	4	5	6	7
23	Mulle meeldib selle kursuse sisu.	1	2	3	4	5	6	7
24	Selle kursuse sisu mõistmine on minu jaoks väga tähtis.	1	2	3	4	5	6	7
25	Mu süda lööb kiiremini, kui teen eksamit.	1	2	3	4	5	6	7
26	Olen kindel, et omandan põhjalikult sellel kursusel õpetatud oskused.	1	2	3	4	5	6	7
27	Arvestades selle kursuse raskust, õpetajat ja minu oskusi, siis arvan, et saan sellel kursusel hästi hakkama.	1	2	3	4	5	6	7

## Osa B. Õpistrateegiad

Järgmiste küsimustega uuritakse Sinu õpistrateegiaid sellel kursusel. **Jällegi ei ole õigeid ega valesid vastuseid. Vasta küsimustele, kuidas Sa õpid sellel kursusel nii täpselt kui võimalik.** Kasuta sama skaalat, et vastata ülejäänud küsimustele. Kui arvad, et väide on Sinu kohta väga õige, tee ring ümber number 7, kui väide ei ole üldse Sinu kohta õige, siis tee ring ümber numbrile 1. Kui väide on Sinu puhul enam-vähem õige, siis leia number 1 ja 7 vahel, mis Sind kõige paremini kirjeldab.

		1	2	3	4	5	6	7
	(ei ole üldse minu puhul õige)							(minu puhul väga õige)
28	Kui ma töötan kursuse tekstidega, siis panen materjali põhipunktidenä kirja, et oma mõtteid organiseerida.	1	2	3	4	5	6	7

29	Tunni ajal ei pane ma tihti olulisi punkte tähele, sest mõtlen teistest asjadest.	1	2	3	4	5	6	7
30	Ma õpin tavaliselt sellises kohas, kus saan keskenduda oma õppetööle.	1	2	3	4	5	6	7
31	Tihti tunnen end sellel kursusel nii laisa või tüdinenuna, et loobun enne planeeritud tegevuste lõpetamist.	1	2	3	4	5	6	7
32	Kui ma selleks kursuseks õpin, harjutan materjali iseendale uuesti ja uuesti korrates.	1	2	3	4	5	6	7
33	Kui miski, mida ma selle tunni jaoks loen, jääb mulle selgusetuks, siis alustan uuesti ja üritan asjast aru saada.	1	2	3	4	5	6	7
34	Kui ma selle kursuse jaoks õpin, võtan läbi kõik tekstid ja tunnis tehtud märkmed ning püüan leida kõige olulisemad ideed.	1	2	3	4	5	6	7
35	Sellel kursusel õppides kasutan õppeaega korralikult.	1	2	3	4	5	6	7
36	Sellel kursusel püüan teiste õpilastega koostööd teha, et kursuse ülesanded täita.	1	2	3	4	5	6	7
37	Selle kursuse jaoks õppides ma loen oma konspekti ja kursuse tekste ikka uuesti ja uuesti.	1	2	3	4	5	6	7
38	Kui tunnis või tekstides esitatakse teooria, tõlgendus või järeldus, püüan otsustada, kas on olemas seda toetav hea tõendusmaterjal.	1	2	3	4	5	6	7
39	Koostan lihtsaid skeeme, diagramme ja tabeleid, et korrastada kursuse materjali.	1	2	3	4	5	6	7
40	Selle kursuse jaoks õppides võtan ma tihti aega, et kursusekaaslastega kursuse materjali arutada.	1	2	3	4	5	6	7
41	Käsitlen kursuse materjali kui alguspunkti ja püüan selle kohta enda ideid arendada.	1	2	3	4	5	6	7
42	Enne kui hakkam uut kursuse materjali põhjalikult õppima, sirvin tihti selle läbi, et näha, kuidas see on üles ehitatud.	1	2	3	4	5	6	7
43	Esitan endale küsimusi, et teha kindlaks, kas ma mõistan materjali, mida olen kursusel õppinud.	1	2	3	4	5	6	7
44	Püüan muuta oma õppimisviisi, et sobitada kursuse nõuete ja juhendaja õpetamismeetodiga.	1	2	3	4	5	6	7
45	Kui kursuse läbimine on raske, ma kas loobun sellest või õpin ära ainult lihtsamad osad.	1	2	3	4	5	6	7

46	Püüan seostada selle teema ideid teiste kursuste ideedega kus iganes võimalik.	1	2	3	4	5	6	7
47	Kui ma õpin selle kursuse jaoks, töötan läbi tunnis tehtud märkmed ja panen kirja põhimõisted.	1	2	3	4	5	6	7
48	Selle tunni jaoks lugedes püüan seostada materjali sellega, mida ma juba tean.	1	2	3	4	5	6	7
49	Mul on oma kindel õppimiskoht.	1	2	3	4	5	6	7
50	Püüan kaaluda ideid, mis mul endal on tekkinud seoses sellel kursusel õpitavaga.	1	2	3	4	5	6	7
51	Kui õpin selleks kursuseks, siis kirjutan loetud tekstidest ja tunnis tehtud märkmete peamistest ideedest lühikokkuvõtted.	1	2	3	4	5	6	7
52	Kui ma ei saa selle kursuse materjalist aru, siis ma küsin teiselt õpilaselt abi.	1	2	3	4	5	6	7
53	Püüan kursuse materjalist aru saada, tekitades loetud tekstide ja loengus käsitletud mõistete vahel seoseid.	1	2	3	4	5	6	7
54	Jälgin hoolega, et oleksin igapäevaste lugemiste ja kursuse ülesannetega järje peal.	1	2	3	4	5	6	7
55	Mil iganes ma loen või kuulen sellel kursusel väidet või järeldust, siis mõtlen võimalikele alternatiividele.	1	2	3	4	5	6	7
56	Koostan nimekirja selle kursuse tähtsatest punktidest ja jätan selle meelde.	1	2	3	4	5	6	7
57	Isegi kui kursuse materjalid on igavad ja ebahuvitavad, suudan ma õppetöö lõpuni viia.	1	2	3	4	5	6	7
58	Püüan leida kursusekaaslased, kelle käest saan vajaduse korral abi küsida.	1	2	3	4	5	6	7
59	Kui ma õpin selleks kursuseks, sean endale eesmärgid, et oma tegevusi igal õppeperioodil suunata.	1	2	3	4	5	6	7
60	Mul on väga harva aega, et oma märkmed või tekstid enne eksamit üle vaadata.	1	2	3	4	5	6	7
61	Püüan kursuse lugemistekstidest pärit ideid rakendada teistes kursuse tegevustes, nagu loeng ja arutelu.	1	2	3	4	5	6	7



**Appendix 4.** The Estonian adapted and validated version of Self-Regulation of Learning Self-Report Scale (SRL-SRS) by Toering (2012)

Järgnevate küsimustega uuritakse Sinu õpistrateegiaid ja õpiharjumusi. **Pea meeles, et ei ole õigeid ega valesid vastuseid, lihtsalt vasta nii täpselt kui võimalik.** Küsimustele vastamiseks kasuta allolevat skaalat. Kui arvad, et väide on Sinu kohta väga õige, siis tee ring ümber 5, kui ei ole Sinu kohta üldse õige, tee ring ümber numbrile 1. Kui väide on Sinu kohta enam-vähem õige, siis leia number 1 ja 5 vahel, mis Sind kõige paremini iseloomustab.

1 – Mitte kunagi või peaaegu mitte kunagi õige

2 – Tavaliselt ei ole õige

3 – Mõneti õige

4 – Tavaliselt õige

5 – Alati või peaaegu alati õige

		Punktid				
		1	2	3	4	5
1	Probleemi lahendamiseks teen plaani.	1	2	3	4	5
2	Enne alustamist esitan endale küsimusi, mida pean ülesande lahendamiseks tegema.	1	2	3	4	5
3	Kui selgub, et ülesande tegemine ei suju ootuspäraselt, siis muudan oma tegevust vastavalt vajadusele.	1	2	3	4	5
4	Tean, kui palju ma pean ülesandest ära tegema.	1	2	3	4	5
5	Ülesannet täites esitan endale küsimusi, et püsida õigel teel.	1	2	3	4	5
6	Kui olen ülesande lahendamisel järjekindel, saavutan lõpuks edu.	1	2	3	4	5
7	Õppimise hõlbustamiseks koostan ma tegevusplaani.	1	2	3	4	5
8	Kavandan selge tegevusplaani probleemi lahendamiseks.	1	2	3	4	5
9	Ma kavandan aega, kui palju mul mingi õpitegevuse jaoks kulub.	1	2	3	4	5
10	Ma jälgin, kas mul läheb ülesannete tegemiseks nii palju aega, nagu olin planeerinud.	1	2	3	4	5
11	Ma hindan, kas mu ajakasutus oli mõistlik.	1	2	3	4	5
12	Ma hindan, kas olin oma tegevust realistlikult planeerinud.	1	2	3	4	5
13	Sõltuvalt kursuse või ülesande raskusest mõtlen, kust või kellelt võin vajadusel abi saada.	1	2	3	4	5
14	Enne, kui hakkam vastama, püüan mõista ülesande eesmärki.	1	2	3	4	5
15	Kontrollin ülesande tegemise ajal oma tööd.	1	2	3	4	5
16	Ülesande tegemise ajal küsin endalt, kui hästi mul läheb.	1	2	3	4	5

17	Olen kindel, et suudan ootamatute olukordadega hästi hakkama saada.	1	2	3	4	5
18	Piisavalt pingutades saan alati keeruliste probleemidega hakkama.	1	2	3	4	5
19	Tean, kuidas tegutseda ettearvamatutes olukordades, sest suudan välja mõelda strateegiaid uudsete asjadega hakkama saamiseks.	1	2	3	4	5
20	Ma kõrvutan oma töö tulemust eelnevalt seatud eesmärkidega.	1	2	3	4	5
21	Hea tulemuse nimel pingutan kõvasti ka siis, kui ülesanne mulle ei meeldi.	1	2	3	4	5
22	Kui ma ei ole ülesande lahendamisel väga osav, siis võin korvata selle kõva tööga.	1	2	3	4	5
23	Ma tean täpselt, kust ma leian vajadusel infot ülesannete sooritamiseks.	1	2	3	4	5
24	Isegi kui kursuse materjalid on igavad ja ebahuvitavad, suudan ma õppetöö lõpuni viia.	1	2	3	4	5
25	Mul on lihtne oma eesmärkidele keskenduda ja need saavutada.	1	2	3	4	5
26	Tulen tavaliselt toime kõigega, mis ette tuleb.	1	2	3	4	5
27	Hindan oma töö korrektsust.	1	2	3	4	5
28	Ma parandan oma vigu.	1	2	3	4	5
29	Matemaatiliste ülesannete puhul kontrollin, kas mu arvutused on õiged.	1	2	3	4	5
30	Vaatan tehtu üle, et veenduda, kas mu tegevused said õiged.	1	2	3	4	5
31	Vaatan tehtud töö üle ja kontrollin, kas kõik on õige.	1	2	3	4	5
32	Veendun, et lõpetan iga sammu.	1	2	3	4	5
33	Et olla kindel, kas tein kõik õigesti, kontrollin veel kord üle.	1	2	3	4	5

## Appendix 5. Interview questions

1. Mis mulje jäi teile läbitud kursusest üldiselt? Kui mõtlete tagasi sellele kursusele, mis tundes teid valdavad?
2. Esimese ülesandena kursusel pidite koostama õpiplaani, kus teil paluti hinnata oma keeleoskust ja seada eesmäärke algavaks kursuseks. Kuidas see ülesanne teile tundus – kas eesmärkide sõnastamine oli kerge või raske? Miks? Mis oleks seda ülesannet lihtsustanud? Kuivõrd te uue ülesandega alustades mõtlete eesmärkidele, mida tahate saavutada?
3. Õpjuhendite juures Moodles olid teie jaoks lisatud abivahendina märguanded (ehk promptid). Kas te kasutasite neid märguannetes antud suunavaid küsimusi? Kui sageli te neid ühe ülesande tegemisel avasite? Kas neist oli teile kasu? Püüdke kirjeldada, kuidas neist kasu oli.\*
4. Kuivõrd te olete oma varasemates õpingutes mõelnud selle peale, kuidas oleks mõistlik oma õppimist ise juhtida? Kas teil on tuua kooliajast näiteid, kui õpetajad suunasid teid oma õppimist eesmärgistama või jälgima või ise oma tegevust hindama? Kas selline tegevus on vajalik? Miks, mida see õppijale annab? Kas meie inglise keele kursusest, kus teil tuli jälgida ja reflekteerida oma õpiprotsessi, võiks olla teil tuge teha sarnast tegevust ka tulevikus? Kui palju te arvate, et te tulevikus erinevatel kursustel seate endale konkreetseid eesmäärke, jälgite, kuidas nende eesmärkide poole liigute ja vastavalt vajadusele ka reguleerite oma tegevust?
5. Kas inglise keele kursusel antud ülesanded olid teie jaoks huvitavad? Mis oli teie arvates nende suurim väärtus? Äkki oleks saanud neid veelgi paremaks ja kasulikumaks muuta? Mil moel?
6. Te olete inglise keelt palju aastaid õppinud. Kas võite öelda, et teil on välja kujunenud teatud kindlad võtted ja strateegiad, kuidas te, näiteks, uue materjaliga töötate? Kui peate järgmiseks tunniks läbi töötama uue teksti, milliseid võtteid te siis kasutate? Millest teie töövõtete valik sõltub? Kas oskate öelda, millised võtted sobivad teile paremini ja millised halvemini? Kas te ülesande vältel jälgite ise, kuidas teil läheb, kuidas te hakkama saate? Mida te teete siis, kui keset ülesande tegemist selgub, et nii seda tehtud ei saa (valed töövõtted, ei saa aru, tulemust ei tule...)? Kas jätate ülesande tegemata või muudate midagi?
7. Kas ülesande kirjelduse juurde lisatud märguanded küsimuste kujul, aitasid teil jälgida oma edenemist õpiülesande käigus? Mil moel?\*
8. Kui olete ülesandega valmis saanud, kas siis mõtlete ka tagasi ja annate oma tööle hinnangu – kas jäin tehtuga rahule või vajaks see veel üle vaatamist jne? Kursuse ülesannete käigus pidite andma tagasisidet ka oma kaaslastele etteantud hindamiskriteeriumite alusel. Kas kaaslast on raskem või kergem hinnata kui iseennast? Miks? Kas hindamiskriteeriumid aitasid teil jälgida ja hinnata ka oma tegevust? Mida te peate sarnasel keelekursusel kõige olulisemaks hinnata?
9. Mis on teie jaoks see näitaja, et olete kursuse edukalt läbinud? Kas see on hinne või õppejõu kiitus või hea enesetunne või teadmised, et oled targemaks saanud?
10. Kui te püüaksite vaadata end distantsilt, siis missugust õppijat te näete? Katsuge iseloomustada või kirjeldada ennast kui õppijat. Kas see õppija muutus, arenes kuidagi selle kursuse käigus? Mil moel? Kas oma tegevuse planeerimise oskus on ka paranenud?

\* *Questions which were asked only in the interviews in Phase 2.*

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## SUMMARY IN ESTONIAN

### **Üliõpilaste eneseregulatsiooni ja keeleõppestrateegiate toetamine kombineeritud õppe keskkonnas erialases võõrkeeles**

Muutused tänapäeva maailmas ja globaliseeruval tööturul eeldavad inimestelt lisaks uutele erialastele teadmistele ja oskustele ka tõhusamaid õpioskusi. Vastavalt Eesti elukestva õppe strateegias 2020 (2014) dokumenteeritud nüüdisaegsele õpikäsitusele, on üks olulisemaid eesmärke õppija sotsiaalse ja individuaalse arengu toetamine ning õpioskusi arendava õpikäsituse rakendamine. Toetamiseks eduka elukestva õppija arengut on vaja toetada õppija enesejuhtimise oskust ning selle eeldusena enesereguleeritavaid õpistrateegiaid.

Käesoleva doktoritöö uuringud keskendusid keeleõppele kõrghariduse kontekstis. Hoolimata Eesti noorema põlvkonna suhteliselt heast inglise keele oskusest (Kriisa, 2014), on eestlastel sageli raskusi inglise keeles suhtlemisel. Edukas ja sorav keelekasutus eeldab kõrgema taseme keeleõppestrateegiate teadlikku rakendamist. Kuid hea keeleoskuse omandamine ja sobivate õpistrateegiate kasutamine eeldavad muuhulgas õppija võimekust oma õpitegevust reguleerida. Metakognitiivsete õpistrateegiate õpetamisele ja toetamisele ei pöörata Eesti koolides kuigi palju tähelepanu osalt seetõttu, et küllaltki sageli ei ole õpetajad teadlikud õppijate eneseregulatsiooni toetamise vajalikkusest ja võimalustest.

Selle uuringu raames uuritakse õppijate strateegiakasutuse toetamise võimalusi erialase inglise keele kontekstis. Uuringu üldisemaks eesmärgiks on avardada arusaamist õppija eneseregulatsiooni ja keeleõppestrateegiate toetamise tõhususest. Uuringu kontekstis toetati metakognitiivseid õpistrateegiaid parandamiseks õppijate eneseregulatsiooni, ja kognitiivseid strateegiaid parandamiseks õppijate keeleõppestrateegiate kasutust. Uuringu raames otsiti tõhusaimat sekkumist, mis toetaks keeleõppijate strateegiakasutust.

Sellest lähtuvalt sõnastati uuringu üldised eesmärgid:

1. koostada ja valideerida mõõtmisvahend, mis võimaldaks mõõta Eesti inglise keele õppijate keeleõppestrateegiaid;
2. luua ja kontrollida sekkumist, mis toetaks õppijate keeleõppestrateegiate kasutust ja eneseregulatsiooni.

Doktoritöö koosneb kahest osast. Esimene osa (Uuring 1 ja Uuring 2) keskendus keeleõppestrateegiate faktorstruktuuri uurimisele. Teine osa (Uuring 3 ja Uuring 4) on disainipõhine uuring, mis keskendus kognitiivsete ja metakognitiivsete õpistrateegiate toetamise tõhususe uurimisele kombineeritud inglise erialakeele kursusel.

Lähtuvalt töö eesmärgist püstitati järgmised uurimisküsimused:

1. Missugune on Eesti võõrkeeleõppijate jaoks tõlgitud ja kohandatud keeleõppe strateegiate mõõtmise küsimustiku SILL (Strategy Inventory for Language Learning) faktorstruktuur?

2. Kuidas on keeleõppestrateegiate kasutamine seotud keeleõppe õpitulemustega?
3. Missugused õpidisaini põhimõtted (*design principles*) on olulised sellise sekkumise loomisel, mis toetaksid õppijate keeleõppestrateegiate kasutust ning eneseregulatsiooni oskust keeleõppes?
4. Kuidas muutuvad õppijate keeleõppestrateegiate kasutus, eneseregulatsioon ja ainealased teadmised sellise sekkumise tulemusena, mis sisaldavad kognitiivsete ja metakognitiivsete strateegiate toetust?
5. Kuidas tajusid õppijad õpiprotsessi ja oma keeleõppestrateegiate ning eneseregulatsiooni arengut loodud sekkumise tulemusena?

Töö esimese osa esimeses uuringus kontrolliti keeleõppestrateegiate mõõdiku SILL sobivust kasutamiseks Eesti keeleõppijatega. Eesti keelde tõlgitud ja adapteeritud küsimustiku algne 2- ja 6-jaotuseline faktorstruktuur ei andnud häid tulemusi, mistõttu kontrolliti sarnaselt Ameerikas, Aasias ja Aafrikas läbi viidud uuringutele ka mõõdiku 9-jaotuselist faktorstruktuuri. Kuigi see tulemus oli mõnevõrra parem, ei olnud see siiski piisav. Seetõttu võeti Uuringus 2 lisaks Oxfordi (1990) teooriale aluseks ka Coheni (1996) ja O'Malley ning Chamot (1990) teoreetilised raamistikud, mille tulemusena loodi 17-väiteline keeleõppestrateegiate küsimustik Est-SILL. Tekkinud küsimustikul on aktsepteeritavad mudeli headuse indeksid. Küsimustikus olevad strateegiate grupid on aktiivne keelekasutus, metakognitiivsed strateegiad, sotsiaalsed strateegiad, kompensatsioonistrateegiad, mälustrateegiad ja seostamisstrateegiad. Afektiivsed strateegiad jäid eestikeelsest küsimustikust välja. Selle põhjuseks oli enam kui 10 aastat inglise keelt õppinud 18–20-aastastest noorukitest koosneva valimi eripära. Kuna afektiivsed keeleõppestrateegiad iseloomustavad pigem algajaid keeleõppijaid (Oxford, 1990), siis oli ootuspärane, et valimisse kuulunud 12-ndate klasside õpilaste kasutuses afektiivseid õpistrateegiaid ei avaldunud.

Uuring 2 andis vastuse ka keeleõppestrateegiate seotuse kohta õpitulemustega. Sarnaselt varem maailmas läbi viidud samalaadsetele uuringutele selgus, et kognitiivsed õpistrateegiad on seotud õpitulemustega kõigi keelepädevuste – lugemine, kuulamine, kirjutamine ja rääkimine – lõikes. Neist tugevaimat mõju avaldavad kõigile pädevustele aktiivse keelekasutuse strateegiad, mis koondivad enda alla õppija enese poolt algatatud tegevused elulähedastes situatsioonides. Erinevalt aga PISA-testi tulemustest (Mikk jt, 2012), ei näita käesoleva uuringu tulemused metakognitiivsete strateegiate ja õpitulemuste seotust. Küll aga selgus sarnaselt Zhanghi (2014) uuringule, et metakognitiivsed õpistrateegiad panustavad õpitulemustesse kaudselt kognitiivsete strateegiate kaudu. Selline metakognitiivsete strateegiate kaudne ja suhteliselt nõrk seotus õpitulemustega väärib kindlasti edasi uurimist lähtudes mitmest aspektist. Esiteks tuleks uurida, mille poolest erinevad õpiprotsessis kasutatavad õpistrateegiad ja testi olukorras rakendatavad testi kirjutamise strateegiad ja kas nad üksteist mingil moel toetavad. Teiseks peaks rohkem uurima riigieksami ülesehitust ja ülesande tüüpe ning missuguste strateegiate kasutamist nende ülesannete sooritamise eeldab. Samuti oleks huvitav vaadelda, kuidas toimub koolides

riigieksamiks ettevalmistus, kas ja milliste edasijõudnute õpistrateegiate kasutamist toetatakse või toimub riigieksamiks ettevalmistus valdavalt drilli meetodil. Ainsad õppijate poolt kasutatavate strateegiate ja õpitulemuste seosed, mis avaldusid Uuringus 3 ja Uuringus 4, olid seostamisstrateegiate (MSLQ strateegiate skaala) ja kontrolli oma õpiuskumuste üle (MSLQ motivatsiooni skaala) vahel.

Uuringud 3 ja 4, mis kasutasid disainipõhist lähenemist ja keskendusid tõhusaima sekkumise loomisele toetamaks keeleõppijate keeleõppestrateegiate, eneseregulatsiooni ja ainealaste teadmiste arengut, andsid tunnistust sellest, et ainuüksi kombineeritud õpikeskkond ning oskuslikult loodud õpiülesanded ei too kaasa soovitud muutust. Kui ka õpiülesannete koostamisel on arvestatud, et õppijad peaksid nende ülesannete sooritamisel kasutama teatud kognitiivseid ja metakognitiivseid õpistrateegiaid, siis see veel nende strateegiakasutust ei paranda. Täiskasvanud õppijad on tihti peale kindlad, et nende väljakujunenud õpiharjumused on piisavad igasuguste ülesannete sooritamiseks ning nad ei teadvusta endale vajadust areneda õppijana. Suurem toetus ülesannete juurde lisatud märguannete näol, mis suunas õppijaid mõtlema ülesandes rakendatavate kognitiivsete ja metakognitiivsete strateegiate üle, parandas nii nende keeleõppestrateegiate kasutust, eneseregulatsiooni kui ka õpitulemusi. Olulisim järeldus on see, et õppija eneseregulatsioon ei arene iseenesest, seda tuleb toetada ja õpetada.

Käesoleva doktoritöö panus teadusesse on keeleõppestrateegiate struktuuri korrastamine, eestikeelse keeleõppestrateegiate mõõdiku Est-SILL koostamine ja valideerimine ning erialase keeleõppe kontekstis hästitõotava õpimudeli loomine toetamaks õppijate keeleõppestrateegiate ja eneseregulatsiooni arengut. Töö praktiline väärtus seisneb panuses kõrgkoolipedagoogikasse ja õpetajakoolitusse, kus peaks enam tähelepanu pöörama ka täiskasvanud õppijate eneseregulatsiooni toetamisele, ning keeleõpetajate ettevalmistamisel nende teadlikkusele kognitiivsete ja metakognitiivsete õpistrateegiate olulisusest ning nende toetamise võimalikkusest.

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õppe keskkonnas erialases võõrkeeles

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