Task motivation in the EFL classroom

ICT and non-ICT tasks and their connection to task motivation

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Tiivistelmä – Referat – Abstract

Tutkielmassa selvitettiin suomalaisten lukio-opiskelijoiden kokemuksia tehtävämotivaatiosta (task motivation) englannin kurssilla sekä opiskelijoiden yleistä motivaatiota ja asenteita englannin kieltä ja opiskelua kohtaan.Tutkimus on luonteeltaan määrällinen. Aineisto kerättiin kyselylomakkeella vantaalaisen lukion opiskelijoilta (N=126) ja analysoitiin käyttäen SPSS-tilasto-ohjelmaa. Tutkimuksessa tutkittiin sekä perinteisempiä tehtävätyyppejä (ei-TVT) että tieto- ja viestintätekniikkaa (TVT) hyödyntäviä tehtävätyyppejä.

Tutkimuksen perusteella ei-TVT-tehtävätyyppeihin liittyvä tehtävämotivaatio korreloi erittäin voimakkaasti yleisen motivaation kanssa. Lähes kolmannes yleisestä motivaatiosta selittyy näihin tehtävätyyppeihin liittyvällä tehtävämotivaation vaihtelulla. Myös TVT-tehtävätyyppien ja yleisen motivaation väliltä löydettiin tilastollisesti merkitsevä korrelaatio, mutta niiden välinen yhteys ei ollut yhtä voimakas. Korrelaatiot eivät selittyneet taustamuuttujien eli sukupuolen tai kurssiarvosanan perusteella.

Faktorianalyysiä käyttäen tehtävätyypit jaettiin neljään kategoriaan: perinteisiin, projekteihin, sosiaalisiin ja suullisiin. Kaikkien tehtävätyyppikategorioiden todettiin korreloivan yleisen motivaation kanssa projekteja lukuun ottamatta.

TVT:tä hyödyntävät tehtävätyypit korreloivat sekä TVT-taitojen että TVT:n käytön määrän kanssa. Lisäksi TVT-tehtävätyyppien ja sosiaalinen- sekä projekti-tehtävätyyppifaktorien väliltä löydettiin tilastollisesti merkitsevä korrelaatio. Jopa neljännes TVT-tehtävätyyppien ja sosiaalisen tehtävätyyppikategorian kokonaisvaihtelusta selittyi niiden välisellä yhteydellä.

Tuloksia tulkittaessa tulee huomioida, että tutkimus ei pysty osoittamaan syy-seuraussuhteita. Johtopäätöksinä tutkimuksesta voidaan kuitenkin todeta, että yleisen motivaation ja tehtävämotivaation yhteys on voimakkaampi kuin aiemmissa tutkimuksissa on todettu. TVT-taitojen ja käytön määrän korrelaatio TVT-tehtävätyyppien kanssa eivät tue käsitystä diginatiivien sukupolvesta. Lisäksi voidaan todeta, että opiskelijoiden TVT-taitojen kehittäminen olisi näiden tulosten perusteella tarpeen. Lisäksi voidaan todeta sosiaalisten tehtävätyyppien olevan merkityksellisiä tehtävämotivaation kannalta. Tämä päätelmä tukee kommunikatiivisen kielenopettamisen merkitystä.

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1. Introduction

There are a number of factors that affect language learning. However, it is likely that most of us would say, from a purely empirical point of view at least, that motivation is a prerequisite for efficient second language (L2) learning. Most of us would also likely agree that efficient institutional foreign language learning requires active participation in the tasks and exercises in class, especially if a person does not live in a foreign country or engage in extensive extramural foreign language activities outside of the classroom.

Gardner (2010) points out that motivated students are goal-driven, but gives a variety of other characteristics besides this to further expand the term:

> Motivated individuals express effort in attaining the goal, they show persistence, and they attend to the tasks necessary to achieve the goals. They have a strong desire to attain their goal, and they enjoy the activities necessary to achieve their goal. They are aroused in seeking their goals, they have expectancies about their success and failures, and when they are achieving some degree of success they demonstrate self-efficacy; they are self-confident about their achievements. Finally, they have reasons for their behavior, and these reasons are often called motives. (Gardner 2010:8)

When researching motivation we also need to bear in mind that motivation does not necessarily equal excellence. The learner's abilities, learning opportunities, and instructional quality of the teaching itself all play a role in determining the student's learning outcome (Dörnyei 2011). Therefore a study of motivation only is not able to explain why a specific student is more proficient than another. We can nevertheless state that motivation is a key element in helping students perform to the best of their individual abilities (Gardner 1985, Dörnyei 2003).

In Finland teachers have fairly free hands in how they try to motivate their students and construct their courses and classes, but the guidelines are provided in the National Core Curriculum (NCC 2004, 2015). Upon writing this introduction, the new NCC has been published just a month ago. While it has not yet come to effect in classrooms, the differences between the old and the new NCC (2004, 2015) are a hot topic of discussion. One of the biggest differences between the curricula is the emphasis on information and communication technology (ICT) in the new NCC. Therefore I find it important to ask how ICT can be used in the classroom in a way that would motivate students.

In this thesis I will explore the motivational effect of different task types (e.g. textbook-bound or technology-utilising tasks) using statistical methods. This introduction will begin by introducing the research questions. The terms motivation, task motivation and Technology-Enhanced Language Learning (TELL) will be briefly discussed. Background and previous studies are introduced in chapter 2, after which the data and methods are explained in chapter 3. Results of the statistical analyses and a brief account of learner comments on the individual ICT tasks can be found in chapter 4. Chapter 5 discusses these results and provides implications for further research as well as teaching and educational policy. The conclusion chapter draws together some of the main findings.

My research questions in this thesis are:

1) How can different task types be categorised based on how they motivate students?
2) How do different task types correlate with students' overall motivation towards English?
3) When introduced into the classroom for the first time, how do technology-utilising tasks correlate with:
    a) students' overall motivation towards English?
    b) students' ICT skills and use?

The data for this thesis was collected from five A-English classes (N=126) in a Finnish high school with a questionnaire, and analysed using statistical methods (see section 3.4 for a detailed description). The students' overall attitudes and motivation towards studying English was studied by using a mini-AMTB (Attitude/Motivation Test Battery, see for example Bernaus & Gardner 2008), and the motivational aspect of specific tasks by a battery of Likert-scale questions about the effect of various classroom tasks on the students' task motivation. The full questionnaire can be found in Finnish and English in Appendices A and B.

In addition to the statistical analyses providing new information about the motivational effect of different task types, I mean to offer practical suggestions for teachers on how to motivate their students. This is understandably a goal too far-reaching to be answered in just one study. I will therefore look specifically at language learning tasks in the EFL classroom. Tasks, after all, are a key element in any language class, and an element that is easily modified. I will study how different classroom task types relate to task

motivation, i.e. the motivation to participate in a specific classroom task. While there may be several ways of defining a classroom task, in this thesis the term refers to an exercise or activity done in the classroom with a clear pedagogical goal and a clear beginning and end. A task can be a short exercise, for example a vocabulary drill in a book, or a longer project, for example a video produced in class over a longer period of time.

No one theory can comprehensively explain motivation (Dörnyei 2011, Gardner 1985). Dörnyei (2003:1) points out that not only is motivation research in essence trying to deconstruct why humans act and think the way they do on an individual level, but social factors play their part in how and why we relate and react to things, too. Understandably, all this makes motivation an enormously complex construct, but nevertheless a most important one.

L2 learning motivation has long been researched in the fields of both social psychology and applied linguistics, but there seems to be little integration between the study fields (Dörnyei 2003). While social psychologists focus mainly on developing theories on the macro level, linguists take a more micro level view (Dörnyei 2003). This thesis, while leaning heavily on the traditions of applied linguistics, ties the results into the larger scheme of the socio-psychological approach. This is done both in terms of methodology, namely statistical analysis, and theory, Gardner's socio-educational model (Gardner 1985). Motivation as a concept and Gardner's model are further discussed in section 2.1.

Task motivation, though not a new concept, has not been researched as widely as motivation as a whole. Dörnyei (2011) points out that while many experimental studies do look at tasks, not many have focused on task motivation per se, but have rather kept comparing tasks with, for example, learning outcomes. The problem with these learning outcome focused studies is that motivation is not the only attribute in achieving high grades.

In my opinion a study that looks only at motivational factors in language learning should not even try to draw any definite conclusions about learning outcomes as such. However, this has thus far been the main focus in most studies regarding task motivation (Dörnyei 2003). There is a clear lack of studies focusing on task types and

how they relate to overall motivation, and this thesis is a step in the direction of filling this gap.

As one of the first researchers of task motivation, Kyösti Julkunen (2001), points out, teaching is one of the components related to institutional language learning that is easiest to change. It is difficult for a teacher to affect parental encouragement or extramural English use, but the choices concerning tasks and activities in class are in many ways in the teachers', textbook publishers' and educational policy makers' hands. While it is advisable for teachers to promote extramural English use or a positive outlook on the target language culture, classroom tasks are still the core of any language class. Task motivation and its relationship with L2 learning are discussed in section 2.2.

Students' motivation has been studied from many viewpoints in hundreds of individual studies. There is, however, a gap in research concerning ICT use and motivation, especially from a subject-specific EFL point of view. Motivation studies (see Bernaus & Gardner 2008, Dörnyei 2003, Gagné 1985, Gardner 2010, Gardner, Tremblay & Masgoret 1997, Julkunen 2001, Masgoret & Gardner 2003) give us a broad view of what drives students to study a foreign language in the first place, but very little research has been done on classroom tasks making use of ICT, and especially which specific task types motivate students to participate in class. While classroom participation is only a part of formal language learning, engaging students is unquestionably an essential element in a teacher's daily work.

Technology has been used in teaching since the times of the tape recorder, but new devices and software is always around the corner. In addition to the new NCC (2015) that strongly emphasises ICT use the eventual shift to an electronic Matriculation examination in Finland further presses teachers to revamp their teaching. I also have a personal interest in TELL, as my BA thesis shows (Kamula 2014).

Some teachers are already embracing ICT use in their teaching, but there are many who struggle and do not know where to start (see for example Kamula 2014). This thesis and its implications should serve teachers well in deciding what types of tasks to adopt when answering the need for ICT use in their teaching, especially if the teacher is only starting to include ICT in their teaching. I hope to shed some light on what motivates students to actively participate in class. Teachers continuously face students who are not interested in taking part in class, but instead choose to chat, play games and at times

disrupt the class. Different types of learners and individuals enjoy and benefit from different types of classroom tasks, but if teachers were to find tasks that engaged a larger number of students, they would be on their way to reaching even those who might not otherwise pay attention.

In my Bachelor's Thesis (Kamula 2014) I studied Finnish English teachers' attitudes towards Computer-Assisted Language Learning (CALL). I found that while many teachers are already getting familiar and creative with ICT, there are many teachers who find it time-consuming and even futile (Kamula 2014). Many teachers also felt they are not offered enough training and support to be able to use ICT in their teaching sufficiently (Kamula 2014). There is definitely a need for research with practical implementation possibilities that teachers could easily use to help themselves to decide what types of tasks and platforms are most useful in teaching.

The student viewpoint is therefore essential. While many studies suggest ICT can result in similar or even better results than traditional teaching methods (cf. Balanskat, Blamire & Kefala 2006, Chapelle 2012, E-Learning Nordic 2006, Halonen 2015, Heino et al. 2011, Hurme, Nummenmaa & Lehtinen 2013, Kaisto, Hämäläinen & Järvelä 2007, Sauro 2012) and that extracurricular ICT activities can benefit second language acquisition (SLA) (cf. Koivumäki 2012, Uuskoski 2011), there has been very little research on classroom tasks concerning ICT, at least on a wider scope. This thesis aims to show what types of tasks engage students in the classroom. In this thesis I have looked at both ICT-related tasks as well as other, more traditional task types. I will also compare overall attitudes towards the English language and motivation to learn English with task motivation. A more detailed review of existing research on TELL can be found in sections 2.3-2.5.

2. Background

In this chapter I will introduce some key terminology and present some key research in the area, first focusing on the relationship between motivation and L2 learning (section 2.1), then moving on to task motivation and how it might affect learning outcomes (section 2.2). I will give some examples of both why there is a continuously growing need for ICT use in the classroom altogether, and how and why ICT is used currently used, or should be, in English language teaching (ELT) in section 2.3. The benefits and challenges of ICT use in teaching will be discussed in section 2.4. In section 2.5 I will discuss the term digital native.

2.1. Motivation and language learning

Motivation has been studied on the macro level by social psychologists at least since the 1970s (see for example Gardner 1985, Gagné 1985). In the 1990's and after the focus has started shifting towards more specific aspects: course-specific, teacher-specific and group-specific motivational components (Dörnyei 2003, 2011). Then again a broader scope is still useful for comparison purposes even if we are to look at a more specific part of motivation. In this thesis I will use Gardner's socio-educational model (Gardner 1985) as the framework for studying overall motivation and attitudes towards English. Gardner's theory has been widely used in motivation studies for decades now, and while more recent theories exist, the theory has been tested and re-tested (see for example Masgoret & Gardner 2003) thoroughly, thus establishing its position as a very valid model.

The socio-educational model (Gardner 1985) lists integrativeness, attitude towards the learning situation, motivation and language anxiety as the four main variables in L2 learning (Gardner 2010). Integrativeness refers to openness and attitudes toward the L2 culture and language itself (Gardner 2010). Attitude towards the learning situation measures the attitudes towards the course and teacher, while motivation consists of the desire to learn and attitude and intensity of motivation towards learning (Gardner 2010). Finally, language anxiety refers to how anxious the student feels about using the language, e.g. speaking in class (Gardner 1985). Other attributes such as parental

encouragement are considered, but only as additional attributes and not belonging to a larger category in the framework (Gardner 2010).

Motivation emerges as a clear factor in L2 learning even in studies that do not focus purely on researching motivation. A study by Gardner et al. (1997) shows that even when studying many different aspects of L2 learning in a single study (language anxiety, language aptitude, attitudes and motivation, field dependence/independence, learning strategies, and self-confidence), and subjecting them to factor analysis, motivation is clearly established as an individual factor.

Gardner's motivation theory, while being a good model for researching motivation on the macro level, is not specific enough to answer the research questions set in this thesis. It is, therefore, used in order to find underlying wider tendencies and to allow comparison between the overall level of motivation and task motivation. In other words, while the model offers a good view of overall motivation and attitudes towards English, it does not offer specific tools for studying task motivation, and so a second theoretical model is needed to study the motivational effect of different task types. Gardner himself states that the classroom is for many students "the major opportunity […] to experience and use the language" (Gardner 2010:181).

All in all SLA is a multifaceted process that comprises both affective factors and cognitive skills (Mitchell and Myles 2001). Mitchell and Myles (2001) list language attitudes, motivation and language anxiety as affective factors and overall language aptitude and language learning strategies as cognitive skills. This thesis looks at the affective factors only, and thus does not try to explain language learning as a complete process. Next we will take a look at task motivation as a concept and a theoretical model.

2.2. Task motivation

Overall motivation to learn is, as discussed in the previous section, an important element in L2 learning. Another important element in an institutional L2 learning setting is the manifestation of this motivation in the classroom. Dörnyei (2003) suggests that task motivation is clearly an area that has thus far been researched way too little:

> … instead of looking, for instance, at how learners' various motivational attributes correlate with language proficiency measures in an L2 course (which would be a typical traditional design), researchers need to look at how motivational features affect learners' various learning behaviours during a course, such as […] their engagement in learning tasks[...] (Dörnyei 2003:23)

Researchers focusing on classroom tasks have used varied approaches and many theories have been developed for explaining classroom engagement. Since language learning requires practice, it is imperative that teachers get students to participate in tasks in class. I will start this section by outlining three models regarding tasks and motivation, after which I will briefly discuss their benefits and shortcomings in order to provide reasonable grounds for my conceptual choices.

According to Dörnyei's process-oriented conceptualization of motivation there are three levels in the motivational behavioural process: the preactional stage, the actional stage and executive motives (Dörnyei 2011, presented originally in Dörnyei and Ottó 1998). The preactional stage consists of goal setting, intention formation and initiation of intention enactment, essentially the processes needed before actually embarking on the task at hand (Dörnyei 2011:198). The actional stage, to put it simply, refers to the actual performing of the task (Dörnyei 2011). Finally executive motives are those that enable the task to be carried out and continued in order to achieve completion (Dörnyei 2011).

Dörnyei also presents a model of motivational task processing that has three interrelated components: task execution, appraisal and action control (Dörnyei 2011). Task execution is the student's engagement in the task. Appraisal refers to the student responding to whatever is going on in the class and constantly evaluating their own progress and the environment, meaning the actions of teachers and peers as well as grades and results. Action control processes are scaffolding and performance-enhancing actions that the student uses to self-regulate and prevent slowing or stopping the action (Dörnyei 2003: 14-16).

The process-oriented conceptualization (Dörnyei 2011) does prove a valid framework for studying the underlying processes behind task execution, but in my view is too broad a classification to be used in this thesis. The motivational task processing model (Dörnyei 2003) on the other hand is too restricting in its details and thus is not the best model for researching specific task types, since appraisal and action control processes are not the focus.

Another classification is provided by Gagné (1985). Gagné has divided overall classroom motivation into task motivation, incentive and achievement motivation (1985:306). The concept of task motivation was developed by Julkunen in the 1980s (originally presented in 1981, reprinted in Julkunen 2001). Julkunen defined task motivation as consisting of general motivation and the learner's attitude towards the situation as a whole, or in other words, how the individual perceives the task and everything relating to it (Julkunen 2001).

Broadly speaking Cagné's (1985) and Dörnyei's (2011) classifications could be seen to describe the exact same phenomena (task motivation vs. actional stage, incentive vs. preactional stage and achievement motives vs. executive motives), and thus the choice of term might at first seem irrelevant. However this thesis, rather than focusing on the process, is interested in studying the actual engagement and involvement in the task rather than trying to uncover the reasons behind it. In this thesis I measure the students' subjective experiences of task motivation, rather than observe or measure for example classroom activity. It is not the action that is the main point of interest, but the experience of the motivational effect. Thus the term task motivation holds up better than its rival.

Continuing with Julkunen's definitions, then, high task motivation consists of multiple elements. It means the student is engaged throughout the task, the task is perceived as important, it is seen to further the student's individual goals, it feels doable (not too difficult), but not too easy either and it offers satisfying learning outcomes (Julkunen 2001:33). Julkunen further states that it is evident all criteria might be difficult to fulfil simultaneously for all students at all times, but it is something to strive toward (Julkunen 2001). After all, is it not better to have the students enjoy the learning process? As the previous section shows, there is strong evidence that motivation plays a key role in SLA, and I for one find it hard to believe task motivation would not play a similar part in a formal learning context.

Julkunen (1989) divides motivation as a whole into state and trait motivation. State motivation refers to the learner's situational motivation, and trait motivation to general motivational orientation. This model is the framework used in this thesis to describe the relationship between task motivation and overall attitudes towards English (the socio-educational model, Gardner 1985). It can be argued that this model provides only a

simplified view of task motivation since it does not take into account that task motivation is not constant and unaltered, but depends on a number of internal and external factors, as well as temporal changes (Dörnyei 2011). Nevertheless for the scope of this study it proves a valuable framework.

It is important to bear in mind that not all classroom participation equals constant activity that is always visible to the teacher. Some learners prefer to listen quietly and talk only when given an oral exercise, while others bombard the teacher with continuous questions. Obenland (2012) studied a science class and found that silence does not necessarily mean the students are not engaged. Further he found that the silent students reported that an active classroom environment increased their engagement (Obenland 2012). Obenland (2012) further reported that silence might just be an indicator of a student's personal learning style.

While Obenland's (2012) study was conducted in a science classroom, I believe the results can be relevant in an EFL context as well. Not all language tasks concern oral communication, and most of all good communication skills do not necessarily develop only through oral exercises in institutional language learning situations, as Uuskoski's (2011) and Sauro's (2012) studies discussed in section 2.4 show. This also signifies that merely observing the amount of active participation does not necessarily measure engagement, but the students' experiences need to be taken into account to be able to build a picture of how engagement affects students' classroom participation.

Having stated that communicativeness is not always a visible element in all tasks in a language class, it is notable that learning to communicate using the L2 is one of the major objectives of L2 learning, and communicative language teaching (CLT) aims precisely at achieving this. CLT is also evident in the new NCC (2015). In fact CLT is one of the major current trends in L2 teaching. CLT emphasises L2 learning through communication rather than, say, grammar drills or oral repetition, and authentic communication is seen as the goal in classroom tasks (Gardner 2010). In my view it is important to keep communicativeness in mind when studying L2 classroom tasks since it is currently emphasised in L2 learning research, even if CLT is not the main focus in this thesis.

Gardner (2010) evaluates classroom motivation to be a highly influential factor in L2 learning. Gardner (2010) further states that many of the factors involving classroom

activity are out of the control of the teacher. Factors like tiredness and personality affect classroom motivation greatly. Interestingly he also suggests that highly motivated students are more likely to prefer greater autonomy in the classroom (Gardner 2010). It will be interesting to see whether this manifests in the results.

According to Nelson (2010), positive feedback (such as earning tokens for active participation) can add to classroom participation. He calls for further research on reasons behind increasing participation in class (Nelson 2010:54). While assessing or measuring classroom participation is immensely difficult due to different personality types the students have, Nelson's study (2010) shows that students do feel that classroom participation aids their learning. Task motivation is undoubtedly a big part of classroom participation, and this thesis aims to find implications of how classroom participation could be improved by the use different task types.

2.3. ICT use in teaching – history, present and future

In the 1970s and 1980s, before the World Wide Web, ICT use in language teaching consisted mostly of standalone software programs that mostly included drills for learning vocabulary and grammar (Chun 2012). Later the beginning of Web 1.0 brought with it the first asynchronous and synchronous computer-mediated communication platforms such as discussion forums (Chun 2012), which later proved to be highly beneficial to SLA (e.g. Sauro 2012). Web 2.0 brought with it more user-created content and interaction, such as blogs and wikis (Chun 2012). Also Massively multi-player online games (MMOG) became popular (Chun 2012) and later intensive MMOG gaming has been shown to have statistically significant positive correlations with learners' English grades (Uuskoski 2011). Chun (2012) suggests that with Web 3.0, the "portable personal web", we will see the line between formal and informal language learning blur even further.

Teachers are nowadays expected to adopt TELL on a new level and train their students to become critical media literates and skilled ICT users. As mentioned before the new National Curriculum (NCC 2015) strongly emphasizes ICT use and requires teachers to adopt it in the classroom. Besides being mentioned in the course description of one 1st year English course (ENA2; NCC 2015:116-117), digitalization is also, for example, mentioned in the general section concerning study environments (NCC 2015:7), where

it is emphasized that students should be able to find and construct knowledge using versatile digital platforms and tools. In fact, ICT and digitalization is mentioned over and over in several other sections as well (NCC 2015:8, 25, 26). Overall it is evident that students are expected to grow into critical media consumers and able ICT users mastering multiple modalities, devices, programs and platforms.

Hurme et al. (2013) studied 5,767 Finnish high school students' ICT use both at home and in school. The results support my claim that teachers have yet to take ICT widely to use. Only 37% of the respondents reported using computers in school on a weekly basis and 78% do not use tablets at all in a classroom environment (Hurme 2013). However, over half of the students (53%) reported using mobile phones on a weekly basis in school. It is quite striking that a fourth of the respondents (26%) reported their school not having laptops or tablets for student use. While it is possible that the students did have access to a computer lab with table-top computers, computer labs are very limited in their versatility for innovative ICT use. The study also showed that ICT was mostly used for material distribution and searching for information instead of, for example, communicative tasks (Hurme 2013). This further supports my claim that while many schools provide students with ICT devices, teachers do not seem to be taking them to use, at least in very versatile ways.

My Bachelor's thesis (Kamula 2014) showed that many EFL teachers in Finland suffer from lack of knowledge and training to adopt TELL. Another study suggests that teachers all over the world suffer from insufficient training and knowledge in the area (Del Puerto 2009). Even teacher trainees both in Finland (Viitanen 2014) and abroad (Pegrum, Howitt & Striepe 2013) seem to share these feelings. Since even current teacher training does not seem to give future teachers sufficient tools to handle TELL, future generations of teachers might be in danger of not being able to cope with the demands the NCC (2015), and consequently the whole schooling system, sets them. Subsequently we are at risk of creating more inequality in schools: students with strong ICT skills will have an advantage to those less confident around technology.

The teachers' concerns regarding ICT integration are indeed understandable. As Chapelle (2012) says, there are so many ways of using technology in teaching that less tech-savvy teachers can easily become frustrated by the sheer amount of options. Another issue is raised when we talk about choosing which tasks and platforms to use.

Teachers understandably wish to adopt the most effective and engaging task types, but how is this choice made? Chapelle states:

> […] researchers hope to make a range of assertions about the quality of interactions, acquisition of particular linguistic features, benefits of intercultural encounters, and users' opinions about specific aspects of the activities. (Chapelle 2012:4)

The eventual shift to an electronic Matriculation examination also further presses teachers to rebuild their teaching, since students are expected to be familiar with electronic testing environments by the time they are to take their final exams. According to Tarvainen's (2014) research, students felt they performed worse in the digital test than they would have in a paper version of the exam, with only 22% of the respondents favouring the digital exam over the paper version. It does indeed seem that students need to be familiarised with digital learning and testing environments for them to be able to get over their initial anxieties, regardless of their own computer skills. From all this it is easy to arrive to the conclusion that ICT is expected to take even more hold of the life of teachers and students.

In a national survey to Finnish teachers produced by the National Board of Education most teachers (52%) reported using ICT in their teaching daily and a third (31%) at least weekly (Mikkonen, Sairanen, Kankaanranta & Laattala 2012). The interest in ICT seems to be great since 64% of the teachers would like to use ICT more in their teaching and almost as many (61%) felt students could process new knowledge in versatile ways with ICT. However among the most often used software and hardware were office software such as word processing, administrative software and "practical equipment" such as data projectors and lab equipment (Mikkonen et al. 2012). Multimedia tools, mobile devices, smart boards, simulation softwares and digitalised learning games were among the least used (Mikkonen et al. 2012). Also only 47% of teachers felt that one reason for their ICT use was to help their students develop their ICT skills (Mikkonen et al. 2012). It would seem that many teachers still feel that either ICT skills are unimportant or irrelevant in their subject and perhaps should be taught as a separate subject rather than as an integrated part of e.g. a language or biology class.

Before moving on to further discuss ICT use and its benefits and challenges in language learning I will discuss the terminological choice between the terms Computer-assisted language learning (CALL) and Technology-enhanced language learning (TELL). In essence CALL and TELL refer to the same phenomenon; using ICT to aid teaching, but

TELL further expands the concept, moving from ICT merely assisting teaching and learning to ICT being an inherent part of the communication and culture surrounding our lives, not only in school, but everywhere (Walker & White 2013). In this thesis I am using the newer of the two terms, TELL. While CALL refers to using ICT in teaching as an assisting feature, TELL sees ICT as an integral part of the environment where the language is used (Walker & White 2013:9). In CALL ICT is looked at as only a mode for practicing language, but in TELL it is recognised as a natural part of much of the communication in every context, not only in institutionalised teaching (Walker & White 2013). The term TELL also better describes how technology should be used in the classroom: it is not an absolute value in and of itself, but rather an instrumental one.

Both terms, however, pose the same problem: both end in the word learning. In my view the terms are problematic since they are based on the assumption that learning does happen. This thesis does not focus on learning outcomes, and this needs to be kept in mind. Nevertheless the term is widely used in other contexts not focusing on learning outcomes and it is familiar to many, and so it is used this thesis in spite of its imperfections.

The results from Mikkonen et al. (2012), Kamula (2014) and Viitanen (2014) study point to the fact that in many ways teachers in Finland are still stuck in the CALL era where ICT is far from being a natural part of the learning environment. Technology needs to be recognised as a tool for natural language use, and thus used to aid teaching rather than regard it as something that needs to be used as much as possible without consideration of its usefulness and benefits. As Stroia (2012:39) puts it: "Only an added value to the learning process could justify the computer usage in foreign language teaching, because there's no point in making use of a means, only for the means sake". This is exactly what we turn to next: the usefulness of TELL.

2.4. Benefits and challenges of TELL

The previous section has looked at TELL from a broader perspective. In this section I will take a look at individual studies about the outcomes of TELL, starting with an international perspective looking at TELL without a subject-specific viewpoint. Later I will present results from a domestic and EFL context.

The ICT impact report by European Schoolnet (Balanskat, Blamire & Kefala 2006) presents some findings from several studies that have looked at the impact ICT use has on students, teachers and schools from several perspectives. The report covers several schooling systems in several countries and concerns all school subjects and thus cannot be generalised directly to the Finnish EFL context, but the report offer a good basis for comparison. The studies presented in the report state that ICT is beneficial for learning outcomes for students between ages 7 and 16 in English, and overall teachers, students and parents feel ICT use has a positive effect on learning outcomes (Balanskat et al. 2006).

Similar results have been received in a Nordic context, too. E-learning Nordic (2006) studied teachers and students from several Nordic countries. This report, too, is not subject-specific. The teachers felt that ICT uses has a positive effect on students' performance in school, though in Finland less so (E-learning 2006). While two thirds of their Swedish, Norwegian and Danish colleagues thought ICT was beneficial for school performance, only one third of the Finnish teachers thought so and half of the Finnish teachers reported not having noticed any difference at all (E-learning 2006). Overall students were more negative towards ICT and its effect on learning outcomes than teachers (E-learning 2006). Only a third of the students in the Nordic countries reported their learning outcomes having improved due to ICT use (E-learning 2006).

A questionnaire study from a Finnish context is provided by Kaisto, Hämäläinen and Järvelä (2007). Kaisto et al. found that while nearly half of the students felt they had learned ICT skills in school, only about a third reported having learned actual content knowledge, and subsequent interviews revealed that even this knowledge mostly consisted of individual facts rather than larger constructions of knowledge (Kaisto et al. 2007). It is notable here though that it is likely that not many of the ICT task types the students had been exposed to required extensive work or covered a long enough period of time needed for learning larger constructs.

Halonen (2015) studied Finnish 6th graders' attitudes towards ICT use in class. She found that while students felt ICT use increased their motivation to participate (Fin. kouluinto) the use of ICT was minimal and fairly one-dimensional, focusing mostly on searching for information and mechanical use, such as typing (Halonen 2015). Communicative ICT use (e.g. discussing school work online) was least used out of the

ICT task types studied (Halonen 2015). These results are significant since the students currently in primary school will be facing digital matriculation exams in high school. In the E-learning Nordic (2006) report the researchers found that versatile ICT use enhanced the students' knowledge and skills better than mere material distribution and other passive activities and tasks.

There has not been much research regarding how motivation and ICT are connected. However some theories have been constructed. A study by the Finnish national board of education (Heino et al. 2011) argues that ICT is well suited to guide students' interest towards goals set by the school. Heino et al. (2011:41) present a theory by Smith et al. that divided students' interests into situational and personal interest. Motivation and action driven by personal interest means the activity is powered by personal favourable opinions and interests that arise from the student, whereas situational interest is created by the environmental elements (Heino et al. 2011:41). With situational interest the continuation of interest is dependent upon the triggering element's continuous presence or the introduction of a new "trigger" (Heino et al. 2011:41). If the situational interest is prolonged and the environment favourable, it is possible for situational interest to become personal (Heino et al. 2011:41). In my opinion while this is naturally something to strive for, even triggering situational interest in a student not interested in, say, English, is a goal of its own.

Koivisto (2013) studied students' ICT use and attitudes towards using mobile devices in learning in a Finnish lower secondary school. He found that while the students reported using ICTs in varied ways in their free-time to communicate, they felt apprehensive about mobile devices used for communicative tasks in the classroom, and preferred teacher-centred tasks to student-centred ones (Koivisto 2013). These findings are supported further by Tarvainen's (2014) results presented above. It seems that students are fairly conservative in their preferred classroom tasks and need to be familiarised with new appliances and task types if we wish them to be engaged and motivated. The ICT impact review suggests that from a learning results point of view more proficient students benefit from ICT use most, but that it is beneficial for the learning results of weaker students as well (Balanskat et al. 2006). Balanskat et al. also concluded that ICT use increases the motivation and confidence of students by making schoolwork more fun, thus indirectly molding attitudes and orientations towards a more positive view of school and learning as a whole (Balanskat et al. 2006).

While this thesis focuses on the students' experiences instead of, say, learning outcomes, there are a number of studies focusing on other aspects as well. In fact many studies suggest ICT use can yield similar or even better results than traditional teaching methods, and extracurricular ICT activities can benefit SLA (see for example Balanskat et al. 2006, Koivumäki 2012, Sauro 2012, Uuskoski 2011). This thesis aims to shed light on what types of task types engage students in the language classroom, instead of focusing on extracurricular activities or focusing on a single activity or medium.

When used in a way that does not overwhelm students, TELL can lead to positive learning results (see for example Balanskat et al. 2006, Koivumäki 2012, Sauro 2012). Sauro (2012), for example, suggests that computer-mediated communication (CMC), whether synchronous (text and audio chat) or asynchronous (email, discussion forums etc.), can aid oral language production even without necessarily involving actual oral production. Text chat, for example, may diminish less proficient students' anxiety towards language production and enable them to practice communication without having to worry about pronunciation, shyness or other factors that might impede their language production otherwise.

In the light of these studies it seems one of the major difficulties in TELL is the students' confidence in their ICT skills and their apprehensions towards ICT use in teaching. Though there are benefits to TELL this apprehensiveness needs to be addressed in order to benefit from TELL to the fullest. In the next section I will discuss one key concept in this area: the digital natives.

2.5. Digital natives

Technology, it seems, evolves at a faster pace than we can keep up with. The youth today is often described as "digital natives" (Prensky 2001), which in essence means they are thought to be able to use new technology with considerable ease, to have a critical eye towards media and to have embraced a faster pace in life in general. The term is even used in official contexts (cf. Tulevaisuusvaliokunta 2013).

There is a strong case to be made against this claim. Walker & White even go as far as describing the term as "[a] false dichotomy" (2013:184). Susan Bennett (2012) argues that there is little research supporting the claim that the new generation is in any major

way different from the previous ones in terms of ways to learn technology and process information. Instead she argues that the term should only be applied to a small section of the whole generation (2012). Walker and White point out that research shows that the differences between the level of confidence and skills in ICT use cannot be explained by age, but rather by interest and need (Walker & White 2011:23).

In my experience many of the so called digital natives do not even have a basic knowledge of the most common word processing software, though they might be highly skilled in the use of e.g. social media. While for example Koivumäki's (2012) study suggests that students feel that social media and other new platforms for communication can aid their language learning, other studies show that students need to be familiar with the platforms to be able to relax and engage in the task at hand (e.g. Halonen 2015, Koivisto 2013, Tarvainen 2014). If this is indeed the case, teachers need to take on the responsibility of teaching ICT use to their students, not only because of the positive research results we get from TELL, discussed in section 2.4, but also since the government requires us as teachers to take this to heart.

Another interesting study considering the digital native generation is presented in Heino et al. (2011:42-43). The study measured the attitudes of students of different ages and compared the results to see whether there were significant differences between different age groups. The results showed that older (11-15 year old) students had a very positive outlook on ICT use in teaching (average 4.1 on a scale of 1-5; Heino et al. 2011:43). Overall the older students felt ICT was much more important and useful than younger students (age 9-10; Heino et al. 2011:43). The researchers concluded that the older students had been exposed to much more ICT and thus had had time to learn their use and understand the need for better ICT skills (Heino et al. 2011:43).

Walker and White (2013:24) claim that the brains of the so called "digital native" generation do not seem structurally unlike any previous generation's brains. It is also problematic to assume this since the first "digital native" generation is only now growing, and cannot even have been studied enough (Walker & White 2013:111). The biggest problem just might be the assumption that "digital natives" are intrinsically "into ICT" in every context, whether extracurricular or not (Walker & White 2013:24).

2.6. Summary

In this chapter I have presented some key theories and studies concerning motivation, task motivation and ICT use in teaching and EFL. While there are many comprehensive theories about motivation as a whole, teachers may find it difficult to apply these theories in practice. Subject-specific research is needed to move from socio-psychological theory to easily applicable solutions and more attention needs to be paid to what actually happens in classrooms (Dörnyei 2003, 2011, Julkunen 2001:35).

Task motivation has been somewhat neglected as a field of study, and this thesis is a step towards understanding the connection between task motivation in the classroom and overall attitudes and motivation towards English.

One of the goals of this thesis is to keep the results applicable for practice. This brings the socio-psychological approach closer to the field of applied linguistics and a more practical viewpoint. However by using quantitative methods this thesis is able to provide new and generalizable information that offers benefits for the academia as well.

Finally ICT use, while having been studied from many perspectives, is still such a new field for research that it needs further looking into. Enhancing students' task motivation is something I believe all teachers would want to achieve, but so far it is not clear what types of tasks actually motivate students, and whether there is a difference between what different students are motivated by.

3. Data and methods

In this chapter I will present the sample, the research and questionnaire design and the processes involved in their development, as well as introduce my methods of analysis. The study in itself is cross-sectional in nature, since only one questionnaire was distributed at one given point of time (Dörnyei 2011:208). The chapter is divided into five parts: the sample (3.1), research design (3.2), questionnaire design (3.3), methods of analysis (3.4) and reliability and validity (3.5).

3.1. The sample

The data for this study was collected in the spring of 2015 from five English classes in a high school in Vantaa, Finland. The students' age varied from 15 to 19. Out of the respondents, 44 of them were male, 77 female and 4 other or not willing to give gender information. These particular course groups were chosen because they were taught by the same teacher at the same time. The school is one of the largest in the area, with approximately 1,000 students. The school is not highly fastidious in its admissions, but instead has roughly a medium level of GPA required for admissions. All groups were taught by the same teacher, so the effects of teaching styles and attitudes teachers might have towards, for example, projects or ICT use was controlled. This allows for direct comparisons between the groups on its own part.

While the sample, due to its nature, is not representative of all high school students in Finland, it is a sufficient sample for an overall idea of the way different task types are connected to task motivation and overall attitudes towards English, and thus serves well as a starting point for future research. One hindrance in the representativeness of the sample is the nature of the sampling method. Due to the quasi-experimental nature of the research setup the sample is not random, but rather one of convenience. However, given that the school is not highly prestigious and the students can therefore be assumed to represent different socioeconomic backgrounds, the sample can be judged reasonably representative of the population. It is also notable that in applied linguistics random sampling is rarely possible, and non-probability sampling methods are widely used (Dörnyei 2007:98).

3.2. Research design

The sample was divided into two groups, where in one group the students completed several ICT related tasks throughout the course, and in the other group no ICT was used apart from projectors, audio recordings and other standard classroom equipment. Throughout this thesis these groups will be referred to as the ICT group and the non-ICT group. The ICT group consisted of three course groups: first year students (course ENA3), second year students (course ENA6) and third year students (course ENA11), with altogether 72 respondents. For more information on the individual courses and their requirements, see the NCC (2004). The non-ICT group consisted of two first year course groups (both ENA3) with 59 respondents. The number of the respondents all in all was then 131. All course groups completed varied classroom task types during the course, ranging from strictly textbook-bound tasks to student-produced longer projects.

The term "course" used in this thesis refers to a Finnish Upper Secondary course unit, which is approximately 38 lessons that span over a period of 1.5 months (determined by the NCC 2004). In the Finnish Upper Secondary system there are 6 compulsory A-English courses. The courses used for this study were held in late spring 2015.

The teacher completed several ICT tasks with the ICT group. The tasks, while being approved by the teacher, were mostly chosen by the researcher. The teacher had the opportunity to choose the topic and time for doing the tasks, but she had to use each task type for each of the ICT course groups at least once. The teacher was interested in using ICT in her teaching, but she had not used these particular task types, apart from the online course platform, in her teaching before. Also in the school only one of the language teachers had used ICT in any major way in their teaching, and so the students were unfamiliar with extensive ICT use in a language learning context. Thus, while the questionnaire does not specify whether the ICT tasks were new to the students or not, it is reasonable to assume that only a few students, if any, had previous experience with them.

Quizlet (2015) was used as a vocabulary drill tool, Padlet (2015) as a means of gathering comments on a topic, Kahoot (2015) was used for quizzes and polls, Socrative (2014) for vocabulary tests, different interactive fiction games were used to introduce new topics and an online platform was used throughout the course for material

distribution, returning homework and simultaneous editing. The students also produced their own videos during the course.

The reasons for using these specific tasks and task types were mostly those of convenience. The teacher and the students had to adopt several new software and thus the tasks had to be kept fairly simple. For example text chat was omitted from the task types for this reason; the teacher felt it would be too difficult for her to learn and teach to the students. Other requirements for all task types and software were that they had to be fairly widely used in a teaching context, they had to be freely available (no licencing fees etc.) and that they did not require the students to have to move to a computer lab. Computer labs, while having been useful in the past and partly even now, are not environments that allow for very creative ICT use, and thus mobile devices (including smart phones, tablet computers and laptops) were used for all tasks. The school provided laptops and tablets for the students. The students' personal smart phones were used for some of the tasks.

In this thesis the students' English grades are not studied to prove some task types better than others, but rather to control the level of learners in the data. All in all one course grade is not proof of language proficiency, so the effect of different tasks or task types to learning outcomes cannot be deduced from a single grade.

3.3. Questionnaire design and administration

While Gardner states that effort alone does not signify motivation, it is the combination of effort and desire to learn that comprise motivation (Gardner 1985: 10). In this study both the desire to learn and the effort are measured, the former by testing the level of overall motivation towards the language and the latter by measuring the level of task motivation in relation to several different task types.

According to Gardner (1985) all the individual elements of the socio-educational model affect the overall motivation towards L2 learning. Since motivation may manifest in various forms in the classroom the level of overall motivation is difficult to measure through observing from the outside. Motivation and its intensity are highly connected to feelings and perceptions. Thus they often tend to be researched through questionnaires and interviews.

The questionnaire consists of three parts. The complete questionnaire can be found in Finnish and English in Appendices A and B. It is notable that the layout of the appendices differs from that of the original questionnaire since the questionnaire needed to be transferred in a readable way to a new platform (e-form to a text document). In all parts of the questionnaire the order of the items was randomized. In the first part, called Classroom tasks (in Finnish luokkahuoneaktiviteetit), the students were asked to rate 27 different task types on a 7-point Likert scale according to how well they felt the task type in question motivated them to participate in class. The students had the opportunity to choose *I don't know/doesn't apply* for all task types in case they had missed a particular class and had not taken part in the task.

The development of the task type battery was started by building an item pool of typical classroom tasks based on Bernaus & Gardner (2008) and other task types the teacher mentioned she used (personal communication). The list was further built on by the researcher. The teacher was then given the opportunity to rank out task types she did not intend to use in her upcoming classes.

The task types varied from textbook bound ones (e.g. Q26 Learning vocabulary from the textbook) and individual work (Q2 Individual grammar exercises) to communicative and creative exercises (Q11 Conversations in pairs and Q16 Smaller group projects). Nine of the tasks were ICT-related. Questions 3 (ICT use in teaching), 8 (Producing films during the course) and 18 (Using ICT resources to do research) were general questions not related to any specific software and the software presented in the previous section were asked about in questions 6, 12, 14, 24, 25 and 27. For the non-ICT groups these task types were omitted from the questionnaire completely.

The second section of the questionnaire was the mini-AMTB. As mentioned in section 2.1., Gardner´s socio-educational model (see for example Gardner 1985, 2006, 2010) lists five broad categories for second language (L2) learning, each with its own set of variables: integrativeness, attitudes toward the learning situation, motivation, language anxiety and other attributes.

The full Attitude/Motivation Test Battery (AMTB) is a battery of Likert-scaled questions and statements created by Gardner (1985), and the mini-AMTB (Bernaus & Gardner 2008) is a shorter version of the full battery. All statements in the AMTB relate to one main factor in the model (Gardner 1985). However, the AMTB evaluates

mostly the students' attitudes and motivation toward the language, not so much the environment and materials (Masgoret & Gardner 2003: 173). In the AMTB, only attitude towards the course and the teacher are measured separately. Since the aspects concerning task motivation and the formal learning situation itself are so limited, the battery alone is not designed for studying classroom-specific aspects of learning, such as task motivation. In this thesis the mini-AMTB was only a part of the questionnaire, and task motivation was studied in a separate section.

The mini-AMTB is limited in terms of giving detailed information about specific aspects of motivation (see Bernaus & Gardner 2008), but it gives an overall view of attitudes and motivation that can in turn be compared with the different tasks and task types. It consists of 12 questions measuring different attributes of motivation on a 7-point Likert scale (Q 28-39). The test battery was translated from English to Finnish by the researcher since no established previous translation exists. While the mini-AMTB does not offer insight into different aspects of motivation due to its brevity, it does provide an overall view of the level of motivation towards English and English language learning.

Different main attributes of the socio-educational model (Gardner 1985) were measured each with their own questions. "Integrativeness" was measured in three questions (Q28-30), "attitudes toward the learning situation" in two questions (Q33, Q36), "motivation" was measured in three questions (Q31, Q32, Q38) and "language anxiety" in two (Q35, Q37). Other attributes, namely "parental encouragement" (Q39) and "instrumental orientation" (Q34), were measured with one question each.

Julkunen's (2001) division of motivation into state and trait motivation was considered in the design process. In this thesis trait motivation is measured with the mini-AMTB, and state motivation, also described as task motivation, is studied with the classroom task battery. After the mini-AMTB the ICT groups were given a chance to elaborate on their answers related to the different ICT task types in the first section (Q40-46). A short report of these answers will be provided in section 4.2 to further support the results of the statistical analyses and to offer justifications for the deductions made in chapter 5.

The final part of the questionnaire is background information. The students had to estimate their overall use of different types of equipment (Q47-50: Smart phone, Tablet,

Laptop, Table top computer) and score their ICT skills from very good to poor on a four-point Likert scale (Q51). In questions 52-55 the students were asked to state their course, gender and name. The name was required so later the course grades could be added to the data. These personal classification questions were left to the end as suggested by Dörnyei (2007). The course grade was acquired from the teacher rather than asked from the students to avoid them having to disclose personal or embarrassing information and since not all students necessarily remember their previous grade.

The questionnaire was piloted in a University of Helsinki seminar group, after which some wordings were changed. A research permit was applied from and granted by the city of Vantaa.

All of the answers were collected online using laptops during the last classes of the courses and administered personally by the researcher. The teacher was present to ensure the students would not be alarmed by an unknown person in the classroom. Before starting the questionnaire the students were told of that no individual or even the school would be recognisable from the results and reminded that no third party would be given access to the material. The students were told that while their name was asked in the questionnaire they would be removed before any analysis was done. All this was also stated on the first page of the questionnaire. All sections were also briefly explained as to ensure all students fully understood all questions. The grades for the course were gathered from the teacher after the courses were over since high school grades are public information in Finland.

3.4. Methods of analysis

This thesis is based on quantitative methods due to the nature of the research questions. The main interest is not to find individual orientations and ways in which task motivation affects individual students, but rather to make sense of how task motivation as a concept shows in the student body as a whole. This section briefly starts by describing the data administration and the treatment of outliers and missing values. Later I will introduce the main statistical analysis methods used in this thesis: factor analysis, linear regression analysis and analysis of variance (ANOVA). Also some key statistical terminology will be briefly discussed.

Since the questionnaire was administered online, a data entry process where the respondents' answers are manually entered into a statistical analysis software was not necessary. The respondents could not choose multiple answers for any of the questions and all open-ended fields were comments sections and thus are not included in the quantitative analysis. The data was carefully checked and as a result five respondents' answers were removed due to them clearly not being serious answers (eg. all task types marked as "-3", and/or inappropriate comments in the open-ended questions). Thus the final number of respondents was 126.

Out of the 126 respondents, 6 informants had not entered their name or did not complete their course and thus their grade was impossible to enter, and one course (18 students) was not graded since students only got a pass or a fail. The 24 students whose grade is not available are thus excluded from the analyses regarding the grade, but their answers were used in all other analyses. The names of the students were removed from the data after the grades had been entered. For more descriptive statistics, please see chapter 4.

The data was analysed using the statistical analysis software IBM SPSS, version 23. At this point it is noteworthy that though a Likert scale is not strictly speaking an interval scale, it is customary in statistical analysis to treat it as such to enable statistical analysis methods (Metsämuuronen 2011:70). Thus factor and regression analyses are valid methods for analysing the task types as well as the mini-AMTB.

Outliers can skew statistical analyses in an undesirable way and make the analyses less stable (Metsämuuronen 2005:590) and influence the correlations in the data. Outliers are values that are significantly different from the mean and do not follow normal distribution. Various graphic depictions of the distributions were observed, and no outliers were detected. Extremely deviating values were not present due to the values in the instrument all being Likert-scaled.

Due to the questionnaire design there were several missing values in the task type section of the data. The students had the option of choosing *I don't know/doesn't apply* if they had missed a particular task type. A common way of dealing with missing values in statistical analyses is to exclude these respondents' answers from the analysis completely (Tabachnick & Fidell 2007:66). Since the sample size would have been reduced had this measure been taken, and the validity of the results would have been

further threatened, this was not done. Instead the missing values were imputed into the data using SPSS.

There are several mechanisms to imputing data. One of the simplest is mean imputation, where quite simply the missing values are replaced by the means calculated from the data, thus keeping the mean of the whole section identical to the original (Tabachnick & Fidell 2007:67). This is problematic since the method results in diminishing variance, which is essential for factor analysis and regression analysis.

To prevent the loss of variance in the data, the expectation maximization (EM) algorithm was used. This method strives to retain the relationships between values and variables and preserves their variance, thus enabling further analyses without reducing the sample (Tabachnick & Fidell 2007:68). The analysis keeps means and standard deviations similar, though some fluctuation does happen as a result (Tabachnick & Fidell 2007:68). Altogether 32 values were imputed to the non-ICT variables and 27 to the ICT variables.

This thesis, while introducing some descriptive statistics, focuses mostly on inferential statistics. This means that the results and discussion strive to analyse and deduce underlying features rather than describe mere frequencies. Factor analysis was used to group the non-ICT task types, a mean variable was created to group ICT tasks and the variables concerning ICT use, statistically significant correlations were mapped using a correlation matrix and one-way analysis of variance (ANOVA) as well as linear and sequential regression analyses were used for further analysis. The students' open-ended answers are briefly analysed in section 4.2.

While it is not practical to extensively explain all statistical terms and analyses used in this thesis, I will give brief explanations of the main analysis methods: mean variable, factor analysis, ANOVA, and single and sequential linear regression analyses. [1] For more information on the analysis methods used here, see for example Hatch and Lazaraton 1991, Metsämuuronen 2011 or Tabachnick & Fidell 2007.

The term mean variable quite simply refers to calculating the mean of the answers of a respondent, thus creating a new variable from them. For example: "Never" gets the

[1] Woodrow (2014) states that while it is not customary to provide profound explanations of commonly used statistical analysis methods in academic texts like published articles, it is an important element in the methods chapter of a Master's thesis.

value 0, “Monthly” the value 1, “Weekly” the value 2, and “Daily” the value 3. If a respondent has reported using smart phones daily, tablet computers weekly, laptop computers daily and table top computers monthly, the mean would be (3+2+3+1)/4=2,25. This is the value that this specific respondent gets for the ICT use mean variable.

Moving on to factor analysis, Dörnyei defines it as follows:

> Factor analysis is rather complex mathematically, but fairly straightforward conceptually […]. In order to uncover the latent structure that underlies a large dataset, it reduces the number of variables submitted to the analysis to a few values that will still contain most of the information found in the original variables. (Dörnyei 2011:221)

In other words: factor analysis creates a smaller number of variables (factors) from the original pool of variables (in this case non-ICT classroom tasks) based on how much they correlate with each other. Each of the original variables is given a score referred to as a “loading”, and the higher the loading, the stronger the relation to the factor in question. Loadings higher than .3 are generally considered meaningful. (For a more detailed description of factor analysis, see for example Tabachnick & Fidell 2007.)

When doing factor analysis, Tabachnick & Fidell (2007) suggest the sample size should be 5-10 per item, and since the number of items subjected to factor analysis was 18 and the number of respondents was 126, this condition was met.

Factor analysis was not conducted for the ICT variables because of the research setup. Students in the non-ICT group did not answer questions concerning ICT tasks and imputing missing values for the entire non-ICT groups would have been counterintuitive. Thus the data did not permit the inclusion of the ICT tasks in the final factor analysis. However a preliminary factor analysis for the ICT group that did include the ICT variables clearly showed that the ICT variables formed a separate factor with strong loadings. Thus it was evident that they could be counted to form a separate variable, and so they are analysed by using the mean variable.

A preliminary correlation matrix was formed for inspection of statistically significant correlations in the data. A correlation matrix shows all possible correlations of all studied variables. The statistically significant connections ($p \leq .05$) were then studied further using regression analysis. The full correlation matrix can be seen in Appendix C.

A p-value is a statistical value indicating the probability of chance in a given result. If a particular result of analysis is given a p-value for example of .05, there is then a 5%

chance of that result being due to chance. When the p-value is small enough, the results can be deemed statistically significant. The significance level commonly seen to be sufficient is 5% (p=.05) (Tabachnick & Fidell 2007), and this principle is followed in this thesis. A p-value of .001 or less is considered to indicate high statistical significance.

Regression analysis studies the connection between one or more independent variables (IV) to one dependent variable (DV) (Metsämuuronen 2005:660). Regression analysis can be used to further examine the connection between two variables. Linear regression analysis was used since it is well suited for looking at simple connections between variables. Later in this chapter when residuals of specific models are discussed we will see that no complex connections are evident in the data, and thus linear regression is a sound choice.

There are several types of regression analyses, but in this thesis only single linear regression and sequential linear regression are used. In sequential regression several independent variables are entered into the analysis in a theory-driven order to control the effect of a specific variable, or in many cases to see their joint effect on the DV. In this thesis sequential regression was used to inspect the connection between the non-ICT task mean variable (IV) and overall attitude towards English (DV) after the effect of ICT task mean variable (IV) was controlled and vice versa.

Other criteria for the data's suitability for regression analysis, notes Woodrow (2014), include the variables being normally distributed, the absence of outliers, the homogeneity of variances, a linear relationship between independent and dependent variables and the absence of high multicollinearity, meaning high correlation between the independent variables. Since the task type variables or AMTB question variables are not individually used for regression analysis, but rather their sums of means and the task type factors, it was not necessary to study the distributions of these individual variables. The mean variables and factors, however, were visually inspected and discovered to be sufficiently normally distributed. The absence of outliers has been previously discussed in this chapter. The residuals of the data showed homogeneity of variances and the linear relationships between variables were in order. Multicollinearity would require several independent values to be examined simultaneously. Since most of the analyses are single linear regressions, this is not an issue. Sequential regression was used only to

control the effect of one variable, and thus multicollinearity does not pose a problem in this case, either.

Though regression analysis is intended for determining the effect of an independent variable on a dependent variable, this is mainly a feature of the mathematical structure of the method. Since the research design does not include control groups, and also due to the cross-sectional nature of this study, causality cannot be determined. Again it is notable that in this study the division between independent and dependent variables is arbitrary, but since the mathematical model is based on correlation, in any given study the researcher must always decide the order of the variables based on the theoretical framework and research design.

My reason for the use of regression analysis instead of looking at mere correlations is that regression analysis provides a coefficient of determination (R^2). The coefficient defines how much of the changes in the dependent variable are explained by the independent variable. Even if this study does not seek to prove causality, the coefficient of determination can be used to define how strong the effect is, even if the causality is foregone.

Regression analysis can only be conducted when analysing variables with at least an interval scale. Since gender is not an interval scale, but rather a nominal one, ANOVA was chosen as the method of analysis for studying whether there was a difference between genders. ANOVA is used to determine whether the means of two or more groups differ in a statistically significant way from each other (Metsämuuronen 2005:727). Since only two variables were studied at a time (gender and one other measure, for example overall attitude towards English), all analyses were conducted using one-way ANOVA.

3.5. Reliability and validity

This section will begin with a definition of internal and external validity, after which the research setup will be discussed from these perspectives. Later I will give an overall description of reliability and Cronbach's alpha that is used to determine the reliability of measurement. I will conclude this section with the alpha scores for my three main

instruments: the non-ICT and ICT task type batteries and the mini-AMTB. The alpha scores for factor analysis of the non-ICT tasks will be presented in section 4.1.1.

Dörnyei states that ”a test is valid if it measures what it is supposed to measure” (Dörnyei 2007:51). However, to prove the validity of a dataset or an instrument we need to look at two aspects: internal and external validity. Internal validity refers to how the results of the data are interpreted, and external validity to how the said findings can be generalized to apply to the whole population (Hatch & Lazaraton 1991:33). In other words the former looks at the instrument within itself and the latter at how it and the results derived from it refer to the population as a whole. I will first focus on matters of internal validity and then proceed to evaluate the external validity.

The most common threats to a study's internal validity, as listed by Hatch & Lazaraton (1991:33-34) are "subject selection, maturation, history, instrumentation, task directions, adequate data base and test effect". Subject selection has been explained in sesction 3.1. While it is not ideal that the subject selection is not random and this poses a possible threat to the external validity, as explained further below, the subjects were selected so that they represent the population as best they can in a quasi-experimental research setup.

Maturation, or time-related validity threats such as getting older and tiredness, are not highly relevant in a cross-sectional study. Maturation was considered for example by timing the distribution of the questionnaire to the beginning of the class so the students would not be keen to finish the questionnaire quickly just to be able to get home sooner. Historical threats are more difficult to take into account, but personal communication with the teacher suggests there were no historical factors, such as school policies etc. that could skew the results. Also personal communication with the teacher revealed that ICT was not used to a significant extent by any of the language teachers in school, and thus the ICT tasks were indeed a new addition to the language classroom.

The careful design and piloting of the questionnaire itself reduces the threats concerning instrumentation. The task directions (instructions for the respondents about the questionnaire as well as instructions for the teacher about the task types and the research setup) were also carefully planned and explained to all participants.

While there are several rules of thumb to indicate a number of respondents or subjects to determine adequate data base, they are mostly referential at best. The sample used in

this analysis for the non-ICT tasks is sufficient for the level of analysis it is subjected to (N=126). However since the sample was split in two and only a part of the course groups used ICT the N for the ICT group is 67. This poses a possible threat to the validity of the study on the part of the ICT tasks. Finally test effect, sometimes referred to as learning effect, does not pose a threat to this particular study due to the cross-sectional nature of the research design.

The validity of the AMTB has been discussed at length in several previous studies. As an answer to some criticism towards Gardner's socio-educational model (1985), which the AMTB is based on, Masgoret and Gardner (2003) subjected Gardner's studies using AMTB to a meta-analysis. They found that the battery itself provided consistent results. While this concerned the whole AMTB, and not the miniature version used in this study, the analysis clearly shows that the framework behind the battery is supported by statistical evidence (Masgoret & Gardner 2003). This meta-analysis further validates the theoretical framework behind this study.

Combining these and the fact that factor analysis in itself serves as a validity measure for the task type battery (Woodrow 2014) and the mini-AMTB is based on the full AMTB whose validity has been tested (see for example the aforementioned meta-analysis in Masgoret & Gardner 2003), the main instruments, and the research setup and questionnaire as a whole can thus be stated to have reasonable internal validity. The main threats, as stated before, are those of subject selection and adequate data base concerning the ICT group. Unfortunately the scope of this thesis did not allow for controlling the effect of these.

Internal validity is the first step towards external validity (Hatch & Lazaraton 1991:42). The second is sample selection. The sample needs to be representative of the entire population, in this case Finnish high school A-level English students. However, a quasi-experimental research setup of this kind is near impossible to do with stratified random sampling, and thus the choice of the school (not highly prestigious or low-achieving) and the number of respondents are my justification for representativeness. The sample was not inherently different from the population, and neither was the research setup construed in a way that would suggest the analysis would only produce group-specific results that are ungeneralizable. According to Dörnyei (2007:53) these are usually the main issues in experimental research setups. Participation in the study was, however,

voluntary and anonymous, and the setup had no effect on the students' course grade or posed any other threat to them. The sample is by no means ideal, but this type of convenience sampling is widely used in quasi-experimental applied linguistics studies, and thus justifiable within the field.

Reliability in essence looks at how well an instrument can produce replicable results if repeated in similar conditions (Hatch & Lazaraton 1991:530). Reliability is presented with an internal consistency score (Metsämuuronen 2011:75-76). The score depicts how large the possibility of an error in the data is. The closer the score is to 1, the more reliable the data.

While there are multiple ways of testing this, for quantitative questionnaire data Cronbach's alpha is the most common, though by no means unproblematic. What is notable is that reliability is a feature of the results, not the instrument itself (Dörnyei 2007:50). It is then imperative to measure the reliability of each subsection of the instrument, whether newly constructed or previously established. Thus the reliability scores have not only been calculated for the ICT and non-ICT task batteries and the factors derived from the latter, but also for the mini-AMTB.

In theory, if a reliable dataset is split in half randomly, the results of both halves would correlate with each other (Metsämuuronen 2011:545). Cronbach's alpha calculates the means of all possible split-half scores, thus providing numerical data of the reliability of the results.

Metsämuuronen (2011:78) points out that while a score of .6 or higher has traditionally been seen as the target, it is not necessarily the whole truth of the matter. The main problem with Cronbach's alpha is that it is one-dimensional. It does not take into account the possible multi-faceted nature of latent structures, but relies solely on basic correlations (Metsämuuronen 2011:149). Tarkkonen's Rho, for example, which is based on factor analysis, would be a far more reliable method for calculating reliability (Metsämuuronen 2011:149). Indeed it was considered for measuring the reliability in this thesis, but due to it being too complex to calculate using the chosen software (SPSS), only Cronbach's alpha is presented.

Cronbach's alpha was used to measure the internal consistency of the instruments used: the non-ICT task type battery, the ICT task type battery and the mini-AMTB, all with a 7-point Likert scale. The non-ICT task type battery contains 18 items. The scale was

found to have high reliability (Cronbach's alpha =.793), as was the ICT task type battery containing 9 items (Cronbach's alpha =.840). The mini-AMTB the reliability was slightly lower (Cronbach's alpha =.695), but still over the .6 limit required for reliability. Thus the instruments can be deemed reliable.

Reliability was also calculated for the factors resulting from the factor analysis. The exact scores will be presented in section 4.1, after presenting the results. However the results indicated the factors were indeed reliable.

The one other instrument containing multiple values was how often the respondents used different ICT appliances outside school. The usage of different pieces of equipment among student is not correlational in nature, i.e. those who use laptops daily do not necessarily use tablets or table top computers often as well. Thus a mean variable was deemed to be the best way to measure the total amount of ICT usage. A reliability score was calculated for the item (Cronbach's alpha =-.526), but because of the item's nature the score mainly proves the shortcomings of Cronbach's alpha.

4. Results

In this section I will present the results of all analysis the data was subjected to. Section 4.1 focuses on presenting only the results of the statistical analyses. I will begin by presenting some descriptive data to provide an overall view of the sample. In section 4.1.1 the results of the factor analysis of the non-ICT tasks will be presented, as well as their naming process and reliability of the results. In section 4.1.2 I will present the results from the single linear factor analyses for the non-ICT tasks, and in section 4.1.3 the single linear factor analyses and ANOVA are presented for the ICT tasks. Finally in section 4.1.4 I will present the results of the sequential regression analyses for both ICT (IV) and non-ICT (IV) tasks and their relation to overall attitudes towards English (AMTB) (DV), controlled by the other IV. The students' comments on the individual ICT tasks can be found in section 4.1. Please note that chapter 4 only reports the results without discussion of their implications. The discussion chapter (5) begins with a recap of the most interesting results. All discussion of the results can be found in chapter 5.

4.1. Results of the statistical analyses

Gender distribution and sample size (N) of the entire sample as well as the ICT and non-ICT groups is presented in table 1. The table shows that there were more females than males in the sample, but there is still a sufficient number of each to enable comparison between them. Due to the low number of the "Other" gender option no further statistical analyses were possible for them. They are thus excluded from the ANOVA analysis concerning gender. Note that the N presented here refers to the ICT and non-ICT groups rather than the mean variables. The non-ICT mean variable consists of the mean scores of both groups.

Gender distribution and sample size: the ICT group and non-ICT group and totals

	ICT	Non-ICT	Total
Male	23	22	45
Female	43	34	77
Other	1	3	4
N	67	59	126

Table 1: Descriptive statistics: Gender distribution

Other descriptive statistics, namely medians, means and standard deviations are presented in Table 2. Both median and mean are reported since the Likert scale is not, as stated earlier in the methods chapter, continuous by nature. All other variables in the original data were Likert scaled apart from the course grade. Also the N for the mean variables (AMTB, non-ICT, ICT and ICT use) are presented in the table.

It is important to keep in mind that the means or medians of Likert-scaled items are not necessarily very fruitful to study. All AMTB, non-ICT and ICT items were given values between -3 and +3, negative values being negative responses, 0 being neutral, and positive values being positive. Thus for example a mean that is close to 0 and has a low standard deviation means that on average the respondents did not have strong views of the item in question.

ICT use and ICT skills were given values between 1 and 4, 1 being monthly use or poor skills and 4 daily or very good skills. Overall the students seem to use ICT fairly often and value their skills to be quite good. The course grade values range from 4 to 10. Note that the standard deviations vary to an extent, but direct comparison of the standard deviations or means and medians is not fruitful due to the differences in scales.

Median, mean and standard deviation for the AMTB, non-ICT and ICT mean variables, ICT skills, ICT use mean variable and the course grade

	Median (Mean)	Std. Deviation	N
AMTB	1.41 (1.37)	0.66	126
Non-ICT	0.42 (0.37)	0.69	126
ICT	1.00 (.78)	1.06	67
ICT use	2.75 (2.89)	0.42	126
ICT skills	3.00 (3.15)	0.71	126
Grade	8.00 (7.51)	1.21	102

Table 2: Descriptive statistics: median, mean, standard deviation and N

As mentioned in the methods chapter a correlation matrix for all variables was consulted for determining significant correlations. The full correlation matrix can be found in Appendix C.

4.1.1. Classification of non-ICT tasks: factor analysis

Exploratory factor analysis (EFA) was used for the non-ICT tasks in part 1 (Questions 1, 2, 4, 5, 7, 9, 10, 11, 13, 15, 16, 17, 19, 20, 21, 22, 23, 26) of the questionnaire to determine whether the data showed correlations between certain task types, hereon referred to as task variables, and whether the task variables shared common pedagogically relevant features. The analysis is exploratory rather than confirmatory, since it aims to find underlying factors and latent structures rather than searching for factors based on a pre-existing theoretical model (Tabachnick & Fidell 2007:609-610).

I will begin by explaining my choice of the number of factors and rotation. I will then continue by presenting the results of the analysis and explain the naming procedures. This section will conclude with Cronbach's alpha scores to show the reliability of the analysis.

Several steps were taken to ensure a feasible number of factors as well as the best rotation option (for more information see e.g. Metsämuuronen 2005 or 2011, or Tabachnick & Fidell 2007). Initially three, four and five factor solutions were assessed and rotation options varimax and oblimin were carefully considered.

There are a number of possibilities to decide on the number of factors. One possibility for choosing a feasible number of factors is Kaiser's criterion, where the number of factors receiving an eigenvalue of 1 or more is chosen (Tabachnick & Fidell 2007:644). The eigenvalue is a mathematical term referring to how much information can be derived from a specific factor. Customarily eigenvalues of 1 or higher are deemed sufficient. An eigenvalue of 1.345 was acquired with the fourth factor, and while the fifth factor got an eigenvalue of 1.0, thus being technically applicable, a closer inspection of the factors proved impossible to interpret from a theoretical perspective. The variables loading to some factors did not share clear-cut pedagogical or functional features.

Another method for choosing the number of factors is Cattel's scree test (Tabachnick & Fidell 2007:644). A scree test provides a graph of the eigenvalues of the different hypothetical factors, and a downward curve in one factor is often referred to as an "elbow" (Woodrow 2014:111). The scree test showed an elbow at the fourth factor, and thus the four factor model was further supported. The three factor model proved feasible

in terms of common pedagogical features within factors, but in the end the four factor model was chosen on the basis of the additional factor supported by common pedagogical features, the eigenvalues and the aforementioned Cattel's scree test. Also the smaller the number of factors chosen, the smaller the amount of variance the model is able to explain.

Rotations are a means of observing the factors from different angles. The varimax rotation is an orthogonal rotation method, meaning that the factors do not correlate with each other (Metsämuuronen 2005:608). The oblimin and varimax rotations proved very similar upon closer inspection, and since the data was suitable for an orthogonal rotation, the varimax rotation was chosen. The analysis showed that 47.15% of the total variance of the task variables is explained by the four factors.

Table 3 shows the rotated factor matrix. All task variables loaded to at least one factor with a minimum loading of .41. Apart from four variables all variables had a loading higher than .3 with no more than one factor, thus indicating a fairly clear factor model. The secondary loadings range from .31 to .41, whereas the stronger main loadings range from .861 to the previously mentioned .41. Loadings of .3 or higher are generally considered meaningful.

The four factors were named by the researcher according to the common attributes of the task variables that had strong loadings with the factor. The factor names are therefore based on the analysis and interpretation done by the researcher rather than a pre-existing framework or theory. It is customary to name factors by looking at the indicator value, meaning the variable that presents with the highest loading to a factor (Metsämuuronen 2011:670). This principle was taken into consideration in the naming process, but other task variables with strong loadings to the factor were taken into consideration, too. The final factor names were "Traditional", "Projects", "Social" and "Oral.

Individual and text-book bound task variables loaded strongly with the first factor. The indicator value was Q26 "Learning vocabulary from the textbook" (.81). The other task variables loading to this factor were Q21 "Vocabulary exercises from the textbook" (.72), Q2 "Individual grammar exercises (from the textbook or handout)" (.66), Q9 "Following the textbook" (.60), Q17 "Teacher-produced handouts (.56), Q23 "Self-evaluation during the course" (.54), Q1 "Listening comprehension" (.48), Q10

"Teacher-led conversations" (.47), Q13 "The traditional word-test on paper" (.42) and Q4 "Written translation" (.41). The factor was named "Traditional" because all task variables loading to it apart from Q23 "Self-evaluation during the course" represent conventional, text-book-bound and teacher-centred tasks.

Rotated Factor Matrix

	Factor			
	Traditional	Projects	Social	Oral
26. Learning vocabulary from the textbook	.81			
21. Vocabulary exercises from the textbook	.72			
2. Individual grammar exercises (from the textbook or a handout)	.66			
9. Following the textbook	.60			
17. Teacher-produced handouts	.58			
23. Self-evaluation during the course	.54			
1. Listening comprehension	.48			
10. Teacher-led conversations	.47		.41	
13. The traditional word test on paper	.42			
4. Written translation	.41			
19. Performing and/or presenting small group projects in front of the class		.86		.33
16. Smaller group projects (E.g. short speeches or plays rehearsed and performed in class)		.77	.34	
20. Longer project that require work over several lessons (E.g. portfolios)		.57		
15.Conversations in small groups			.71	
11. Conversations in pairs			.70	.32
5. Playing games from the textbook		.31	.51	
7. Reading texts out loud in class				.66
22. Oral translation				.62

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Table 3: Grouping of the non-ICT tasks (Rotated factor matrix)

The indicator value for the second factor was Q19 “Performing and/or presenting small group projects in front of the class” (.86). The other task variables loading to this factor were Q16 “Smaller group projects (E.g. short speeches or plays rehearsed and performed in class” (.77) and Q20 “Longer project that require work over several lessons (E.g. portfolios)” (.57). This factor was named “Projects” due to it having high loadings from all project-related non-ICT task variables.

The third factor presented high loadings with Q15 “Conversations in small groups” (indicator value, .71), Q11 “Conversations in pairs” (.70) and Q5 “Playing games from the textbook” (.51). The factor was thus named “Social”, since it had strong loadings with interactive oral tasks, but not those related to projects.

The fourth factor had strong loadings with two task variables: Q7 “Reading texts out loud in class” (indicator value, .66) and Q22 “Oral translation” (.62). The factor shows secondary loadings with Q19 “Performing and/or presenting small group projects in front of the class“ and Q11 “Conversations in pairs”, but since they both include speech and the main task variables are the only task variables that include oral production without indicating the need for actual interaction the factor was named “Oral” based on the indicator value.

As Metsämuuronen (2011) points out, reliability should be calculated not only for the data subjected to factor analysis, but for the individual factors as well, and so Cronbach’s alpha was calculated for all four factors. All variables that exceeded the .3 loading mark in a factor, even if they were secondary, were included in calculating the alphas. The alphas were .825 for the traditional factor, .784 for the projects factor, .709 for the social factor and .665 for the oral factor. Since all alphas exceed the .6 limit the results have sufficient statistical reliability.

4.1.2. Non-ICT tasks: single linear regression analysis

To determine any statistically significant correlations between the non-ICT mean variable, the task type factors and other measured variables a correlation matrix was used. A correlation matrix shows all correlations between variables and can thus help determine significant connections for further analysis. In this case these variables included the mini-AMTB mean variable, the ICT task type mean variable, the non-ICT

task type mean variable, the four task type factors, the ICT use mean variable, ICT skills, the course grade and gender. The complete factor matrix can be found in Appendix C.

Table 4 shows the results of the linear regression analyses used to analyse the connections of overall attitudes towards English (AMTB, DV) and non-ICT tasks and task factors (IV) as well as their correlations. The regression analyses are single linear regressions, single meaning that only one independent variable is studied at a time.

The table reports the F values for all regressions. Note that while it is customary to report the F-value and the degrees of freedom (df), they offer no interpretative value on the level of mathematical depth in this thesis. The correlation coefficient is presented in the last column (r).The p-value, as explained in section 3.4 is the score measuring statistical significance. A value below .05 indicated statistical significance and a value below .001 indicates a high significance. The table shows that the connections are significant between all factors apart from the projects factor and overall attitudes towards English (AMTB), as well as non-ICT tasks and AMTB. R^2 reports the coefficient of determination, which is explained in section 3.4.

Single linear regression analyses and correlations for the AMTB mean variable (DV) and non-ICT task mean variable and task factors (IVs) (N=126, df=1,124)

	F	p	R^2	r
Non-ICT	50.57	<.001	.29	.54**
Traditional	23.08	<.001	.16	.40**
Projects	3.37	.068	.03	.16
Social	15.44	<.001	.11	.33**
Oral	4.98	.027	.04	.20*

*. Correlation is significant at the 0.05 level

**. Correlation is significant at the 0.001 level

Table 4: Single linear regression analyses and correlations for overall attitudes towards English and non-ICT tasks and task factors

The non-ICT task mean variable correlates positively with the AMTB mean variable, and the connection is statistically highly significant ($r = .54$, $p<.001$), and further the R^2 suggests that the effect if powerful, with a 29% effect. In essence 29% of the AMTB mean variable is explained by the non-ICT task mean variable. The coefficients of determination are not quite as high for the individual factors, but three out of four factors do show statistically significant positive correlations with the AMTB. The traditional factor shows the highest positive correlation and coefficient of determination

out of the factors ($r = .40$, $p<.001$, $R^2 = .16$), and the social factor's correlation is almost equally strong ($r = .33$, $p<.001$, $R^2 = .11$). The oral factor correlates positively with the AMTB as well, though not quite as strongly, and the effect is not as strong ($r = .20$, $p<.027$, $R^2 = .04$). Interestingly the projects factor does not statistically significantly correlate with the AMTB.

The inspection of the correlation matrix revealed that grade did not correlate with the AMTB ($r = .00$, $p = .97$), the non-ICT mean variable ($r = .04$, $p = .70$) or the ICT mean variable ($r = .02$, $p = .88$) in a statistically significant way. However the oral factor did correlate positively with the course grade, and regression analysis showed that the effect is 11.5%. ($r = .32$, $p = .001$, $R^2 = .10$, $F(1, 100) = 11.46$). A visual inspection of residuals was conducted and deemed to have a suitable homogeneity of variances and a linear relationships between variables.

In the next section I will present the results of the analyses on the ICT tasks in a similar manner as in this section.

4.1.3. ICT tasks: single linear regression analysis

As stated before, ICT tasks (Questions 3, 6, 8, 12, 14, 18, 24, 25, 27) were analysed by using the mean variable. ICT tasks were not included in the previously presented factor analysis since not all respondents answered them. However an exploratory factor analysis with a varimax rotation was done to the ICT group to see whether they correlated internally. The analysis included all task variables, both ICT and non-ICT. The results showed that all ICT variables clearly loaded to one factor with loadings ranging from .78 to .46 with little secondary loadings to any other factors. The other factors did not have such clear pedagogically or theoretically supported loadings as the one only studying non-ICT tasks.

A single linear regression analysis was conducted for the ICT task mean variable (DV) and non-ICT task mean variable, the non-ICT task factors, the AMTB mean variable, ICT skills and ICT use mean variable (IVs). The results and the correlation coefficients (r) are presented in Table 5. Similarly to the analyses presented in the previous section I have reported the F values and degrees of freedom (df), but these do not add any interpretative value and are thus not further discussed.

The non-ICT task mean variable correlates positively with the ICT task mean variable statistically significantly, with an effect of 8% (r = .28, p = .022, R^2 = .08). When looking at the individual non-ICT task factors, however, the social factor shows a highly significant positive correlation with the ICT task mean variable with a stronger effect of 24% (r = .49, p<.001, R^2 = .49). The projects factor also correlates positively with the ICT task mean variable (r = .29, p = .017, R^2 = .08), whereas the two other factors, traditional and oral do not correlate with the ICT task mean variable. While the effect sizes of the AMTB, ICT skills and ICT use mean variables remain smaller, their correlations are still all statistically significant (AMTB: r = .25, p = .043, R^2 = .06; ICT skills: r = .26, p = .034, R^2 = .07; ICT use mean variable: r = .25, p = .042, R^2 = .06). A visual inspection of residuals was conducted and deemed to have a suitable homogeneity of variances and a linear relationship between variables.

Single linear regression analyses and correlations for the ICT task mean variable (DV) and non-ICT task mean variable and non-ICT task factors, the AMTB mean variable, ICT skills and ICT use mean variable (IVs) (N=67, df=1,65)

	F	p	R^2	r
Non-ICT	5.53	.022	.08	.28*
Traditional	0.00	.989	.00	.00
Projects	5.96	.017	.08	.29*
Social	20.55	<.001	.24	.49**
Oral	3.06	.085	.05	.21
AMTB	4.26	.043	.06	.25*
ICT skills	4.7	.034	.07	.26*
ICT use	4.32	.042	.06	.25*

*. Correlation is significant at the 0.05 level

**. Correlation is significant at the 0.01 level

Table 5: Single linear regression analyses and correlations for ICT tasks and non-ICT tasks, non-ICT task factors, overall attitudes, ICT skills and ICT use

These results, while showing statistical significance, are not altogether generalizable due to the small sample size discussed in sections 3.5. They do, however, provide enough statistical evidence to speculate on possible implications and on their part help map useful suggestions for future research.

ANOVA was used to determine statistically significant differences between males and females in all variables presented previously. Interestingly the only significant difference was found to be in terms of ICT skills (F(1,119)=12.26, p=.001). The mean for the ICT skills for males was 3.43 and for females 2.99 on a 1-4 scale, 1 being very

poor skills and four excellent skills. However no difference was found between gender and ICT use or any of the previously examined variables.

4.1.4. Task types and attitudes towards English: sequential regression analysis

Since the AMTB, the ICT task type mean variable and the non-ICT task type mean variables all correlated with each other it was justifiable to subject them to a sequential regression analysis. The analysis was only done to the ICT groups (N=67), since the non-ICT group did not answer the ICT-related task type questions.

Table 6 shows the results of the three sequential regression analyses. The table shows both stages of all analyses: in step one the connection between the DV and the first IV and in step two the changes to the model when the second IV is added. Similarly to the single linear regression, F change and the degrees of freedom are reported here, but as mentioned before they offer little interpretative value on this level of mathematical analysis. Significance of F change gives us the significance score of the second IV's independent effect. F change is equivalent of the p-value. The most important figure in the table is the R^2 change. In the first stage this is the same as the R^2, but when we add the second IV to the analysis the change indicates the strength of the connection between the added IV to the DV with the effect of the first IV controlled.

The first regression was done first using AMTB as DV and the ICT task type mean variable as the first IV and non-ICT task type mean variable as the second IV, the second with the non-ICT mean variable as the first IV and the ICT mean variable as the second. The third regression shows the results of the ICT task type mean variable as DV, AMTB as the first IV and non-ICT as the second IV. While the results of controlling of the overall attitudes are not interesting from a theoretical perspective, the results are presented here since the research design does not permit deductions of causality. The residuals were inspected visually. The inspection showed suitable homogeneity of variances and linear relationships between variables.

The results show that the only connection between variables that stays statistically significant is the connection between the AMTB and the non-ICT task variable when the effects of the ICT task variable is controlled (regression 2). The connection is lost

between the AMTB and ICT task variable when controlling the effects of the non-ICT task variable (regression 1), as well as between the ICT and non-ICT task variables when controlling the AMTB (regression 3). This result further enforces the connection between the non-ICT task type mean variable and the AMTB. The loss of the two other connections is due to the joint effect of the three variables, and while it does not further strengthen the existence of the original correlations, it does not diminish the original connections, either.

Sequential regression 1: The connection between overall attitudes (AMTB) (DV) and the ICT task mean variable (IV), with the non-ICT task mean variable (IV) controlled (N=67)

		r	F change	Sign. F change	R^2	R^2 change
Step 1	Non-ICT	.63	(1,65)=41.95	<.001	.39	.39
Step 2	Non-ICT	.60	(1,64)=0.61	.437	.40	.01
	ICT	.08				

Sequential regression 2: The connection between overall attitudes (AMTB) (DV) and the non-ICT task mean variable (IV), with the ICT task mean variable (IV) controlled (N=67)

		r	F change	Sign. F change	R^2	R^2 change
Step 1	ICT	.25	(1, 65) = 4.26	.043	.06	.06
Step 2	ICT	.08	(1, 64) = 35.77	<.001	.40	.34
	Non-ICT	.60				

Sequential regression 3: The connection between the ICT task mean variable (DV) and overall attitudes (AMTB) (IV), with the non-ICT task mean variable (IV) controlled (N=67)

		r	F change	Sign. F change	R^2	R^2 change
Step 1	AMTB	.25	(1, 65) = 4.26	.04	.06	.06
Step 2	AMTB	.12	(1, 64) = 1.79	.19	.09	.03
	Non-ICT	.21				

Table 6: Sequential regression analyses for overall attitudes, non-ICT and ICT task types

4.2. Learner comments on the individual ICT tasks

The students commented on some of the task types, and these comments shed some light on how and why some tasks were perceived as motivating. Overall all task types received mixed comments. A common element for the tasks that received the smallest amount of critique was a familiarity of form. For example the concept of a text chat is familiar to most and thus the commenting software Kahoot received multiple positive comments, as did the electronic word test software Socrative and the vocabulary drill tool Quizlet. All were described as fun by a majority of the commenters. Google Drive

and filming were the least familiar and received more negative comments. By mistake the students did not have a chance to comment on the interactive fiction games.

Especially the online word tests (Socrative) received multiple positive comments. Some students mentioned the easy options to cheat. One dyslexic student mentioned that online word tests helped her reading.

Also the vocabulary game Quizlet received much praise. While some people felt the game was a waste of time, many said learning vocabulary was quicker than from paper or book. One even mentioned using the software at home to practice. The students who found Quizlet was a waste of time did not specify whether they would have preferred to study vocabulary in a more traditional way, or if they felt vocabulary drills were useless altogether.

Google Drive seemed to be the most difficult to use out of all the software the students used during the course. There students could submit and edit their work and read and comment on the works of others. Many mentioned in the comments section that they found the platform difficult. Some mentioned the hassle of having to create an account and learn something as complicated as (synchronous or asynchronous) online text editing. Others, who had used the platform previously, mentioned it having been a useful addition to normal schoolwork. A couple of students were slightly puzzled by the question, since it mentioned several options for an online platform (Google Drive and Facebook). Two students stated they had not used Facebook for the course and failed to mention anything about Google Drive. Facebook was mentioned in the questionnaire by mistake because originally the teacher was supposed to use different platforms for different courses.

The commenting wall Padlet was praised in several comments, but also critiqued in others. Padlet's anonymity raised most comments, both positive and negative. Several people mentioned that it enabled insecure and shy students to participate. On the other hand Padlet was criticized since some people felt it often resulted in some students posting inappropriate comments due to anonymity.

Filming and editing a video of their own in groups was well liked among creative students. Several students liked the option of doing something creative and out of the box. On the negative side several people said they hated being in the limelight. One person mentioned not being confident about their pronunciation, and a few others that

performing of any kind causes anxiety. The final films were not shared with the whole group in all cases due to the students not wanting other students to see their videos (personal communication). However some mentioned wishing they would have had a chance to see and comment on other groups' videos.

Kahoot, the online quiz tool received mixed comments. Some students felt that they did not learn anything through Kahoot and deemed it useless because of that. It is interesting that all communicative tools received critique about them not teaching anything. Perhaps students are so used to textbook centred and individual schoolwork that they might not realise the value in communicative exercises.

5. Discussion

In this thesis I have studied how different task types and students' overall attitudes towards English are related to task motivation. My research questions, as stated in the introduction, were:

1) How can different task types be categorised based on how they motivate students?
2) How do different task types correlate with students' overall motivation towards English?
3) When introduced into the classroom for the first time, how do technology-utilising tasks correlate with:
    a) students' overall motivation towards English?
    b) students' ICT skills and use?

In this chapter I will discuss the implications of the results of the statistical analyses and the students' comments on the ICT tasks. Section 5.1 will discuss the results of research question number one, 5.2 focuses on the second research question and section 5.3 discusses question number 3. The order of the upcoming sections is not from the most significant results to the less significant. The second research question, which resulted in some of the most significant findings, is largely based on the results of the factor analysis of the non-ICT task types (research question 1), which on its own is not highly informatory in its implications. Research question 3 that focuses on ICT task types also resulted in some very interesting results, but since their analysis is partly based on comparison with the non-ICT types these results are discussed after the non-ICT task types. However before exploring the research questions I will recap the most important findings.

Overall attitudes towards English and motivation to learn it were measured with the mini-AMTB (Masgoret & Gardner 2003). As shown in section 4.1.2 and 4.1.3, overall attitudes (AMTB) correlate with task motivation regarding both ICT and non-ICT task types as a whole. This indicates that those with a positive attitude towards English and a high motivation to learn it are also have a higher task motivation as a whole in the classroom.

The connection between the non-ICT task types and overall motivation (AMTB) is very strong, as the single and sequential linear regression analyses show in sections 4.1.2 and

4.1.4. This result is perhaps the most significant finding in this thesis since it shows the indisputable connection between overall motivation and task motivation. In fact the connection is so strong that it suggests that task motivation might be a higher indicator of motivation than previous research has given credit to. This and other results regarding non-ICT tasks are discussed further in section 5.2.

The non-ICT task types were categorised based on their effects on students' task motivation using factor analysis. The full factor matrix can be found in table 3 in section 4.1.1. The factors were named ""traditional", "social", "projects" and "oral". There was a statistically significant correlation between the AMTB and three of the four non-ICT task type factors: the traditional, social and oral factor. No correlation was found between the AMTB and the projects factor. Since these results cannot be thoroughly discussed without presenting and discussing the classification of the task types, the results of the factor analysis will be presented first in section 5.1, and the motivational effects of the individual factors later in section 5.2.

The ICT task types correlated positively with the non-ICT task types and the AMTB, as stated in section 4.1.3. Interestingly the ICT task types also correlated with the projects factor and the social factor, but not with the traditional or oral factors. The results indicate that the studied ICT task types are motivating for those who are already motivated to learn (AMTB) and those who are motivated by interactive non-ICT task types.

Another highly noteworthy result in this thesis is the strong connection between the ICT task types and ICT skills and use, presented in section 4.1.3. The more comfortable a student is with ICT, the more likely they are to be motivated by ICT-utilising tasks. While this may not be a highly surprising result, it is nonetheless a very important one, since it further disproves Prensky's (2001) widely used concept of a "digital native" generation. These results are further explored in section 5.3.

The comments about the individual ICT task types presented briefly in section 4.2 revealed that students indeed felt apprehensive towards new types of platforms and software. Many ICT task types that were similar to those the students were already familiar with received more positive comments about their motivational effect, and many negative comments concerned the students' frustration if they were not familiar with the ICT task type in question.

The background information; namely the course grade and gender, did not offer much in terms of significant results. The course grade correlated with the oral factor, but not with any other measured variable. Gender showed to only provide information to explain the students' ICT skills, but not any other variable. Thus these background variables do not seem to affect task motivation or overall motivation as a whole on the basis of these results.

5.1. Task type categorisation

As stated above, the non-ICT task types were divided into four factors named "traditional", "projects", "social" and "oral". The full factor model is presented in section 4.1.1. The traditional factor included textbook-bound and teacher-centred task types. The projects factor included all project work-related task types, whereas other interactive oral task types formed the social factor. The remaining factor, oral, included individual oral tasks not requiring interaction. The ICT tasks were not included in the factor analysis, but are discussed separately in section 5.3. Nevertheless the ICT tasks did form a separate factor in the preliminary factor analysis, as explained in section 4.1.3.

The results show that traditional textbook-bound and teacher-centred task types clearly appeal to some students, since all of these task types showed strong loadings to the traditional factor. It is interesting to find such clear evidence of some students being motivated by traditional, even to some extent outdated task types.

It is possible that some students feel the task types in the traditional factor are more effective and thus motivating at least partly since the students are so used to them. As mentioned in section 4.2 a couple of students pointed out they preferred textbook-bound tasks to others since other task types did not feel as effective. Whether this is due to habit or authentic interest in traditional teaching methods is debatable and cannot be deduced from these results.

In light of the new NCC (2015), which emphasises CLT in language learning, these results are interesting. If some students are motivated by the traditional task types because they feel these task types aid their learning better, should we not only educate teachers about the effectiveness of CLT and TELL, but instruct students about their

benefits as well? CLT aims at students becoming confident and fluent language users as opposed to those who may use the language grammatically perfectly correctly, but struggle to manage any form of spontaneous language production. In the traditional factor only one task type includes oral production (Q 10 "Teacher-led conversations"), and even that does not necessarily require participation from the entire class.

The task types involving oral language use were divided into three separate factors based on the factor analysis: projects, social and oral. The projects and social factors are most in line with the CLT-related requirements set in the new NCC (2015), while the oral factor represents a rather mechanical way of practicing oral skills.

My first research question asked how different task types can be categorised based on how they motivate students. It indeed seems that different students are motivated by different task types and these task type factors can be classified based on their pedagogical objectives. This classification is further studied in the next section, where I look at how these task type factors relate to students' overall motivation. It is in the next section where many of the most significant findings of this thesis lie.

5.2. Non-ICT tasks and motivation

My second research question concerned how the non-ICT task types were connected to overall motivation and attitudes. The students' attitudes and overall motivation were studied using the mini-AMTB (Masgoret & Gardner 2008) and the motivational effect (task motivation) of the non-ICT task types by combining the results of all non-ICT task types. In this thesis I have measured students' subjective experiences. It is important to keep in mind that visible classroom activity does not necessary equal high task motivation. Task motivation does not only appear as visible activity in class, but also through students' subjective experiences, as suggested in Obenland et al. (2012).

As presented in section 4.1.2, there is a statistically highly significant positive correlation between overall attitudes towards English (AMTB) and task motivation regarding non-ICT tasks. The effect of the connection is also very high since 29% of the variance of the AMTB can be predicted by the non-ICT tasks or vice versa. In other words almost a third of the changes in either overall motivation (AMTB) or the non-ICT task types are due to changes in the other.

The connection between the AMTB and the non-ICT task types is further enforced by controlling the effect of the ICT task types in the sequential regression analysis presented in section 4.1.4. In sequential regression the motivational effect of the ICT tasks is in a way excluded from the results, thus leaving only the effect of the non-ICT task types.

The results show that the connection remains nearly as strong as before the controlling of the effect of the ICT tasks. The simple connection between the AMTB and non-ICT tasks had the effect size of 39%, and the effect size of the sequential regression model was 34%. Note that the sequential regression analysis was only done to the ICT group (N=67), and so the effect size is different from the one in single regression analysis (29%), which concerned the whole group. Though the sample size is smaller, the results further support the finding that task motivation and overall motivation indeed are strongly connected and one can to a large extent be used as indication for the other. With ICT tasks the picture is slightly more complex. Therefore ICT tasks are discussed in a separate section.

Considering the multifaceted nature of motivation and the fact that theory suggests task motivation to be only a part of motivation as a whole (Dörnyei 2003, Julkunen 2001) these results are highly significant. It would seem that task motivation might be higher an indicator of overall motivation than previous studies have given credit to. This is a highly interesting result and indicates that more weight needs to be put on both researching task motivation further and emphasising the importance of task motivation in teaching and educational policy making.

The results indicate that state and trait motivation (Julkunen 2001) seem to go hand in hand, since the AMTB (trait motivation) correlated with the ICT and the non-ICT task types, and also the non-ICT task type factors (task motivation=state motivation) apart from the projects factor. Motivation cannot be seen as a combination of unrelated attributes, but all elements of it are interrelated and complex in nature. Developing a negative or a positive attitude towards English, or any other subject for that matter, is a lifelong process, and the underlying reasons for what these attitudes become are many and varying. What is interesting is how this process manifests in the classroom. The results of the regression analyses presented here indicate that the more negative the attitude, the smaller the motivation to participate. This study focuses on an EFL

perspective, but it would be extremely interesting to repeat the study in other languages and subjects as well. The strength of the connection would suggest that overall motivation could definitely be connected to task motivation across different subjects as well.

There are many possible reasons to explain these results. It is understandable that those who want to learn English and have favourable attitudes towards the language are more eager to learn it, and thus take part in the tasks in school. It is nonetheless interesting that task motivation correlates with overall attitudes. This does not, however, explain why the grade correlated neither with the AMTB nor with the any of the task types.

There is no statistically significant correlation between the course grade and overall attitudes towards English or non-ICT or ICT task types as a whole, so neither overall attitudes nor task motivation seem to be connected to better grades. However there is a statistically significant positive correlation between the oral task type factor and the course grade, meaning that the students who are motivated by the tasks in the oral factor tend to get better grades than those who are not. The reasons behind this connection are not instinctively clear, so further research is needed to provide an explanation for these results.

As stated in the introduction this study does not focus on learning results, so the lack of clear connections between the motivational variables and the course grade are reassuring in terms of validating the study: the correlations found can be stated to be due to the link between attitudes and task motivation rather than learning results.

The teacher said she does take classroom activity into account when grading, but only to round up the number a student gets from an exam (personal communication). If a student has shown to be conscientious in their work and actively participate in tasks in class the exam grade can be rounded up. Grading is thus not highly dependent on a student's classroom activity.

On the other hand, what is surprising about the results regarding the grade is that highly motivated students do not seem to get better grades. Since only one course grade was used and language proficiency was not measured in any other way, no definite connections can be made. One interesting future research subject could be the measuring of actual classroom activity and comparing it with the subjective experience of task motivation of the student. However measuring classroom activity is another

issue entirely, since as mentioned in section 2.2 not all activity and engagement necessarily manifests in measurable ways, such as straightforwardly answering the teacher's questions, and thus the entire research design should be designed to measure the varied ways classroom activity and task motivation manifests in the classroom.

As stated in section 4.1.2, three of the four factors correlate positively with the AMTB. What is interesting is that all found correlations are positive. It seems that those with a more negative attitude do not feel motivated by any of the task types more than the students with a more positive attitude towards English. I would point out though that the effect size of the correlation is not as strong when it comes to the oral factor (4%), though the correlation is still statistically significant. The effect sizes between the social and traditional factors and attitudes are much stronger (11% & 16% respectively), and the results are statistically highly significant. There appears to be no quick fix to motivate the unmotivated to participate, at least in terms of task type choice.

Gardner's (2010) research results suggest that the higher the student's motivation, the more autonomy the students want to have in the learning process. Out of the four task type factors the ones that offer the most autonomy are the projects and the social factor. These results do not seem to strengthen Gardner's (2010) claim, since the projects factor that offers greater students autonomy does not correlate with overall motivation (AMTB). For example the traditional factor that includes task types such as "following the textbook" and "teacher-led conversations" and the oral factor that includes "oral translation" and "reading texts out loud in class" offer far less student autonomy, but these factors do correlate with the AMTB. However since autonomy was not measured as such in this thesis, affirmative conclusions would require further study.

5.3. ICT tasks and motivation

The third research question studied the connection between the ICT tasks and the AMTB as well as ICT skills. Some examples of the students' comments on individual ICT task types presented in section 4.2 are presented to further justify my conclusions. While these comments do add to the argumentation, the conclusions still arise from the results of the statistical analyses.

The results of the analysis of the ICT tasks proved very interesting. ICT tasks do seem to motivate a certain section of students, as the preliminary factor analysis discussed in the beginning of section 4.1.3 showed. The most interesting results arise from the second part of the third research question concerning the connection between ICT tasks and ICT skills and use.

Both ICT skills and ICT use correlated positively with the ICT task types, so a student is more likely to be motivated by ICT tasks if they use ICT to a greater extent and if they estimate their ICT skills to be better. These results could be due to the fact that the students who have better ICT skills and/or use them more already have a personal interest in them (Koivisto 2013, Tarvainen, 2014). The division of interest into personal and situational (Heino et al. 2011) provides a possible explanation. Students who already have good ICT skills and use them a lot are more likely to have a personal interest in ICT. Situational interest of the students not so proficient in ICT use may be more difficult to raise.

These results also strengthen my claim of the problems of the concept of digital natives. The students who do not feel they have strong ICT skills are not motivated by ICT tasks. This further presses the need for both educational policy makers and teachers to take students with weaker ICT skills and less experience in ICT use into account when using ICT in the classroom. The electronic matriculation exams and the new NCC (2015) require students to learn comprehensive ICT skills.

Most of the learner comments support my claim about familiarity being important in the motivational effect of tasks as well, since the opinion seemed to highly depend on whether the students had used the platform before or not. This further presses my point about students needing adjustment time and information about the benefits of TELL to see the benefits of new task types, whether communicative, TELL or something completely different. Unlike Prensky (2001) and others assume, the "digital native" generation does not seem so native after all.

There is a statistically significant positive correlation between ICT and non-ICT task types, suggesting that students who are more motivated to participate tend to be so not only regarding non-ICT tasks, but the ICT ones as well. While this study did not measure classroom activity, but rather the subjective experiences of the students, the results do suggest that those more motivated to participate do not only have a more

positive view of English, but also tend to be more open to different task types in general, and vice versa.

The AMTB and ICT tasks correlated statistically significantly with an effect size of 8%. This means that 8% of the motivational effect of the ICT tasks can be explained by the overall motivation and attitudes towards English (AMTB) and vice versa. The effect size if not as significant as with the non-ICT tasks (29%). The sequential regression analysis showed that the connection is lost if the effect of the non-IT task types in controlled. As mentioned before, this does not suggest that the original connection between the non-ICT task types and the AMTB is in any way false, but rather that a significant portion of the correlation exists because the ICT task types correlate with the non-ICT task types, which in turn correlate strongly with the AMTB. Since the correlation between the AMTB and non-ICT task types is so substantial, the ICT task type correlation with the AMTB is in a way drowned by the strength of it.

In the comments section, when commenting on ICT use in teaching in general, several students mentioned that it was refreshing to use something other than a book. Others commented that it felt frustrating to have to take out the devices, that it was tedious and futile to learn to use new software, or that the reliability of the internet connection or devices caused unnecessary hassle. These comments further show that indeed some students tended to have a more positive view towards TELL overall, while some were apprehensive of its usefulness.

Another interesting result is the relationship between the ICT task types and the non-ICT task type factors. The ICT task types do not correlate with the traditional or oral task type factors, but the connection is statistically significant between the ICT task types and the projects and social factors. It is not necessarily surprising that the traditional and the ICT task types do not correlate, since there is no inherent connection between the two. Also the oral factor has little similarities with the ICT task types.

The connection between the social task type factor and the ICT task types shows high statistical significance and a 24% effect size, so nearly a fourth of the variation in one variable is explained by the other. The projects factor and the ICT task types do correlate, but the effect size of the connection (8%) is somewhat smaller than that between the social task type factor and ICT task types. The social and projects task type

factors share similar characteristics in that they both are highly focused on communication and the practicing of group work and negotiation strategies.

The connections between the projects and social task type factors and the ICT task types could suggest that the communicative aspects of TELL are present in the ICT task types chosen. While many of the task types used were originally designed for individual use (e.g. the vocabulary training software Quizlet, interactive fiction games), they were not often used individually (personal communication). Most of the ICT tasks studied here enable interaction, and so it is reasonable to assume that this was an explanatory feature behind the connection. This communicational element seems to be the explanatory factor in the ICT task types' connections to the non-ICT task type factors.

The connection between the ICT task types and the social and project factors is also interesting from the CLT point of view. It seems that the students who are motivated by the ICT task types also tend to be motivated by project work and especially social task types. This supports the notion that the communicational aspects of TELL are in line with the CLT paradigm, where language learning is seen to happen as a consequence of communication and natural language use.

Another suggestion for the reason behind the connection between the ICT task types and the social and projects task type factors is the social nature of the ICT use of the age group. Much of the students' ICT use revolves around social media and other communicative platforms, and it is possible that the more interactive ICT tasks are therefore more familiar to the students. This possibility is further supported by the fact that ICT use correlates with the ICT tasks, so the more a student uses ICT the more likely they are to be motivated by ICT tasks.

One interesting recurring feature in the comments was the fact that many of the communicative and interaction-requiring tasks were perceived as "useless" from a learning perspective, contrary to vocabulary drills etc. that received positive comments about their aiding the students' language acquisition.

While for example Uuskoski (2011) found significant differences in the ICT use habits (especially related to gaming) between boys and girls, such a division was not evident in these results. Gender only played a role in terms of ICT skills, where the results showed that on average boys estimated their ICT skills to be better than girls. There were no significant differences between genders in any other measured variables

5.4. Limitations of the study

In this section I will discuss the limitations that the research design and other factors may cause. This thesis is based on a cross-sectional questionnaire study using correlational analysis methods, and thus it is not possible to deduce causal relationships from these results. The results do, however, provide relevant new data about the relationships between task motivation and overall motivation.

The results are based on self-reports, so it is possible that some informants have for example over- or underestimated their ICT skills or the motivational effect of some variables. Differences in personality may also effect answering styles. When dealing with questionnaires it is always necessary to remember that the subjective experiences and personalities affect the way questionnaires are answered (Dörnyei 2011).

Effort was made to phrase all questions and answer options clearly, but not all students understood the aim of the questionnaire perfectly. For example one student mentioned that they had not used Facebook as course platform even though Google Drive, the platform they had used, was mentioned in the question, too. When asked about the filming of a video one person mentioned that the topic of the video was dumb, though the students were told not to judge the tasks by the topics they were used to discuss, but their motivational effect alone.

One important aspect to consider is whether the students actually commented on and evaluated the motivational effects of task types or something else, for example how entertained they were by the task type. Comments reveal that students seemed to have a fairly good idea of what was asked of them, since many mentioned participation and classroom activity. A few students evaluated how much they felt they had learned through a given task, which, while not being the focus, may well be a motivational component for some students.

The five course groups were divided into two: the ICT and the non-ICT group. The main reason for the group division was to create a scenario where the motivational effect of the non-ICT tasks could be controlled. However this comparison did not prove feasible and was not applied in the final analysis. Another reason for dividing the sample into two groups was that the teacher felt the ICT tasks required more planning and effort, mostly due to them being new to her. The teacher felt her workload would

have increased greatly had she had to complete all ICT tasks with all course groups. The non-ICT tasks were all familiar to the teacher from her previous teaching experience. Thus the research setup is only manipulated for the ICT tasks.

In this thesis Gardner's socio-educational model (1985) offers the basis for measuring motivation. While Gardner's theory divides overall motivation and attitudes into multiple factors, as discussed in section 2.1, this study has only looked at overall motivation and attitudes as one. Thus conclusions of how different task types correlate with the different attributes of the socio-educational model cannot be made.

All in all motivation is a wide-ranging concept. Lightbown & Spada (2006:63) remark that "measuring motivation is never straightforward, and the relationship between it and linguistic achievement is intricate and dynamic with several other factors influencing it (as cited in Uuskoski 2011:55)". I would also like to point out that this study has not taken into account the temporal nature of task motivation (Dörnyei 2011). Task motivation has been studied as the subjective experiences of the individuals cross-sectionally. Taking temporality into account would require a longitudinal study.

5.5. Implications for further research

There are many key points raised above that would require further study. Below I have only listed a few options that in my opinion would most likely lead to the most interesting results.

The most interesting future research subject from the point of view of these results would be a longitudinal study concentrating on the motivational effects of ICT tasks during a longer period of time. This would allow the students to get accustomed to the task types and give them a broader view of the possibilities they offer. Testing task motivation not only after a brief introduction, but also in later stages would give us information on both how the task types are perceived in the beginning, but also whether the motivational effect increases, as previous studies suggest (Halonen 2015, Koivisto 2013, Tarvainen 2014).

Longitudinal studies could also offer us further insight into the causality of task motivation and overall motivation. While motivation can be linked to personality and temperament, there are circumstantial factors in effect as well. If a student's overall

motivation towards EFL increases, for example due to increased contact with English speakers, does task motivation increase accordingly, or are personality, socioeconomic status or other more innate factors more likely to be the causes for high task motivation? If task motivation is mostly due to circumstantial factors, or even better, a cause for overall motivation, we should be able to define which task types affected task motivation most, and could thus use this to further develop teaching to a more motivating direction. Longitudinal research could also reveal how school-time task motivation affects various elements of adulthood, such as employment or marital status.

This thesis is able to offer further support to previously established theories and the results allow for educated guesses of possible underlying causes of task motivation. A qualitative approach (whether interviews or something else) would help in uncovering what exactly creates task motivation. This questionnaire could also easily be applied to other L2 classes in different languages, and with slight modifications to any other subject as well. Comparisons to these results would indeed be interesting.

Also a mixed methods study combining for example the measuring of classroom activity and comparing it with the results of a similar questionnaire as used in this thesis would be interesting. A study of this kind could reveal the connection between task motivation and its actual manifestations in the classroom and thus aid in teachers' assessment of classroom activity. It is possible that parts of task motivation are not visible to the teacher, and thus a study comparing students' individual and subjective experiences with the activity that is visible to an observer could aid in further understanding what elements comprise task motivation.

Due to the research design the ICT group's sample size was not optimal. For the results to be truly generalizable the study should be conducted again with a larger sample. The results are nonetheless strong from the point of view of statistical reliability and thus give relevant information about the relationships between the measured variables. A larger sample combined with an increase in the number of ICT task types would also enable a factor analysis of the ICT tasks, so that a classification of tasks based on their effect on task motivation could be done for ICT tasks as well. It would be interesting to see whether the task types would fall under similar categories as the non-ICT tasks in this thesis.

5.6. Implications for teachers and educational policy

I believe it should be obvious to all who work with the youth and have even the smallest understanding of modern technology that not the whole generation can adopt and use new platforms and software without instruction and aid. Certainly there are those who can, but for the most part the use of ICT is restricted to the familiar and the popular. My results clearly point to this being true.

Since the new NCC (2015) emphasises TELL and the electronic matriculation exams are approaching, teachers need to start moving out of their comfort zones and into new areas. Not only are teachers in need of more instruction and aid (Kamula 2014), but my results show that also students need guidance. Learning ICT skills should not be left to the students alone, but instead teachers should take an active role in helping students develop them. The teaching of these skills should be gradually integrated into all subjects, and the students should be given enough instruction in ICT use.

Of course every single class or course students take part in during their time in high school does not have to use ICT. What would be more fruitful is a schoolwide discussion about which teachers, subjects and/or courses should use ICT and to what extent. Subsequently school policies could then be developed so that the responsibilities for teaching ICT skills would be divided using conscious deliberation. This would be a substantial improvement to the current system where in many cases ICT is used and taught by the teachers who want to do so, without the school supervising equality of ICT education for the students. The new NCC (2015) also emphasises the need for integrated learning of ICT skills. It is up to individual schools to decide how this is done, but most importantly it should be done intentionally and consciously to make sure no student is left with inadequate instruction.

Textbook and learning material publishers could also benefit from the results presented in this thesis. For example the motivational effects of different task types could shed light on how to create more motivating textbooks. Many textbook publishers also provide online material in addition to the physical textbook. Publishers should take the fact that students seem to be more motivated by ICT-utilising task types that seem familiar to them into account. Online material could then be developed so that it shows familiarity of form. Perhaps by gradually introducing new elements to already familiar

task types the students would start becoming more familiar with TELL. Publishers also need bear in mind that all online material needs to include clear instructions for use. Previously there has seemed to be a preference for traditional drill type exercises that have little to do with TELL. Much of the additional online material has in the past been unable to tap into the possibilities technology has to offer.

6. Conclusion

In this thesis I have shown that there is a clear connection between overall attitudes towards English and task motivation. I have looked at two different types of tasks: both those that utilise ICT and those that do not, and the results show that different task types motivate students in different ways.

Non-ICT task types are strongly connected to overall attitudes towards English. It seems that task motivation and overall attitudes towards English are even more tightly connected than we have thought before, and both teachers and policy makers should take task motivation into account. Future research will hopefully uncover whether high task motivation is caused by high overall motivation, or if highly motivating task types can affect the overall motivation and attitudes towards the target language as well.

The communicative aspects of TELL also seem to motivate a certain part of students. The clear and strong connection between communicative and social non-ICT task types and the ICT task types shows that the students who are motivated by communicational aspects in tasks also appreciate similar task types when using ICT. While some students stated that the communicative task types did not aid their learning, this is most likely mainly an implication of some students not being used to CLT as opposed to more traditional task types.

However the fact that ICT use and skills are correlate with the ICT task types suggests that those students who feel less confident about ICT use and have less experience in their use are less likely to be motivated by ICT task types. The concept of digital natives is further debunked by these results, since it seems students need to already be familiar with ICT and confident in ICT use to be able to find the motivational value in a new type of ICT task. More instruction is needed so even those more apprehensive towards ICT could learn to use technology to their benefit.

This thesis has looked at task motivation from an EFL point of view. I hope future studies will shed light on whether the connection between overall motivation and task motivation is visible in other subjects as well, as I believe it must be. Task motivation, and overall motivation perhaps even more so, are multifaceted constructs with numerous interrelated elements, and a single study can only hope to uncover a small part of their underlying features. More research is needed to comprehensively explain

these concepts, but on the whole it seems apparent that task motivation is such a large part of motivation that it indeed deserves more looking into.

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Appendix A: Questionnaire in Finnish

Luokkahuonetyöskentelymotivaatio englannin opiskelussa

Tässä tutkimuksessa tutkitaan opiskelijoiden tuntityöskentelymotivaatiota. Kyselyssä sinua pyydetään pohtimaan sekä yleistä suhtautumistasi englannin opiskeluun, että tällä kurssilla käytettyihin luokkahuoneaktiviteetteihin.

Vastaa alla oleviin kysymyksiin valitsemalla lähinnä omaa mielipidettäsi oleva vaihtoehto. Kyselyllä mitataan motivaatiota, joten vääriä vastauksia ei ole. Vastaathan jokaiseen kysymykseen. Voit halutessasi täsmentää vastaustasi kommenttikentässä.

Tutkimus on luottamuksellinen. Vastauksia ei voida yhdistää yksittäiseen opiskelijaan eikä koulun nimeä mainita tutkimuksessa. Kukaan muu kuin tutkija itse ei näe vastauksiasi, ei edes opettajasi. Aineisto tuhotaan tutkimuksen jälkeen.

Tämä kysely on osa Helsingin yliopiston Nykykielten laitoksen englantilaisen filologian pro gradua. Tutkimuksen tekijä on Anna Kamula ja ohjaajana toimii Anna Solin. Mikäli sinulla on kysyttävää tutkimuksesta, ole yhteydessä tutkimuksen tekijään (anna.kamula@helsinki.fi) tai välitä yhteydenottopyyntö kurssin opettajan kautta.

Luokkahuoneaktiviteetit

Mieti jokaisen kysymyksen kohdalla, kuinka paljon kyseinen aktiviteettityyppi kannustaa ja innostaa sinua osallistumaan tuntityöskentelyyn. Aktiviteettityypit ovat luonteeltaan yleisiä. Älä keskity niinkään siihen, mitä aihepiiriä luokassasi on sen avulla käsitelty, vaan siihen, motivoiko kyseinen aktiviteettityyppi yleisesti sinua osallistumaan työskentelyyn.

Vastaa alla oleviin kysymyksiin valitsemalla lähinnä omaa mielipidettäsi oleva vaihtoehto:

-3. Vähentää motivaatiota osallistua tuntityöskentelyyn erittäin paljon
-2. Vähentää motivaatiota osallistua tuntityöskentelyyn melko paljon
-1. Vähentää motivaatiota osallistua tuntityöskentelyyn jonkin verran
0. Ei vaikutusta luokkahuonetyöskentelymotivaatioon ja osallistumisaktiivisuuteen
1. Motivoi jonkin verran aktiiviseen luokkahuonetyöskentelyyn
2. Motivoi melko paljon aktiiviseen luokkahuonetyöskentelyyn
3. Motivoi erittäin paljon aktiiviseen luokkahuonetyöskentelyyn

Kuinka hyvin sinua motivoivat seuraavat aktiviteettityypit:

	-3	-2	-1	0	1	2	3	En osaa sanoa
1. Kuuntelutehtävät								
2. Kielioppitehtävien tekeminen itsenäisesti (kirjasta tai monisteesta)								

3. TVT:n (tieto- ja viestintätekniikka), eli tablettien, älypuhelimien, tietokoneiden jne. käyttäminen opetuksessa								
4. Kääntäminen kirjallisesti								
5. Kirjassa olevat pelit								
6. Quizlet-sanastoharjoittelupeli								
7. Tekstien lukeminen ääneen luokassa								
8. Omien videoiden tuottaminen kurssilla								
9. Oppikirjan mukaan eteneminen								
10. Opettajan johtamat keskustelut								
11. Parikeskustelut								
12. Padlet-seinä kommenttien keräämisen välineenä								
13. Perinteinen paperinen sanakoe								
14. Sähköinen oppimisalusta (Google Drive, Facebook)								
15. Pienryhmäkeskustelut								
16. Pienryhmäprojektit (esim. lyhyiden puheiden tai näytelmien yms. työstäminen luokassa)								
17. Opettajan tuottamat monisteet								
18. Internetin yms. teknologian mahdollistamien lähteiden hyödyntäminen tiedonhaussa luokassa								
19. Pienryhmäprojektien esittäminen luokan edessä								
20. Suuremmat, usean tunnin ajan työstettävät projektit (esim. portfoliot)								
21. Kirjan sanastoharjoitukset								
22. Kääntäminen suullisesti								
23. Itsearviointi kurssin aikana								
24. Kyselyt ja quizit älypuhelimen avulla (Kahoot)								
25. Tietokoneella tai tabletilla tehdyt sanakokeet (Socrative)								
26. Sanaston harjoittelu oppikirjan avulla								
27. Tarinapelit (työharjoittelusimulaattori, ajokorttipeli)								

Kommentteja?

_____

Yleinen asenne englannin opiskelua kohtaan

28. Se, että pystyn kommunikoimaan englantia puhuvien ihmisten kanssa, motivoi minua opiskelemaan englantia..

Erittäin vähän						Erittäin paljon

29. Yleinen asenteeni englanninkielisiä ihmisiä kohtaan on..

Erittäin kielteinen						Erittäin myönteinen

30. Olen kiinnostunut vieraista kielistä..

Erittäin vähän						Erittäin paljon

31. Haluni oppia englantia on..

Erittäin heikko						Erittäin vahva

32. Asenteeni englannin opiskelemista kohtaan on..

Erittäin kielteinen						Erittäin myönteinen

33. Asenteeni englannin opettajaani kohtaan on..

Erittäin kielteinen						Erittäin myönteinen

34. Motivaationi englannin oppimiseen käytännön syistä (työpaikan saaminen jne.) on..

Erittäin alhainen						Erittäin vahva

35. Englannin puhuminen luokkahuoneen ulkopuolella jännittää minua..

Erittäin vähän						Erittäin paljon

36. Asenteeni englannin kurssiani kohtaan on..

Erittäin kielteinen						Erittäin myönteinen

37. Englannin puhuminen tunnilla jännittää minua..

Erittäin vähän						Erittäin paljon

38. Motivaationi englannin oppimiseen yleisesti on..

Erittäin alhainen						Erittäin vahva

39. Vanhempani kannustavat englannin oppimistani..

Erittäin vähän						Erittäin paljon

Kommentteja?

_____

Kyselyn alussa kysyttiin erilaisten luokkahuoneaktiviteettien vaikutusta tuntityöskentelymotivaatioon ja aktiivisuuteen. Tässä osiossa voit tarkentaa vastauksiasi siitä, miksi koet alla olevien aktiviteettityyppien vähentävän tai lisäävän työskentelymotivaatiotasi.

40. TVT:n (tieto- ja viestintätekniikka), eli tablettien, älypuhelimien, tietokoneiden jne. käyttäminen opetuksessa yleisesti

_____

41. Quizlet-sanastoharjoittelupeli

_____

42. Omien videoiden tuottaminen kurssilla

_____

43. Padlet-seinä

_____

44. Sähköinen oppimisalusta (Google Drive, Facebook)

_____

45. Kyselyt ja quizit älypuhelimen avulla (Kahoot)

_____

46. Tietokoneella tai tabletilla tehdyt sanakokeet (Socrative, Quizlet)

_____

Taustatiedot

Arvioi, kuinka usein käytät näitä laitteita koulun ulkopuolella.

	En koskaan	Kuukausittain	Viikottain	Päivittäin
47. Älypuhelin				
48. Tablettitietokone				
49. Kannettava tietokone				
50. Pöytäkone				

51. Kuinka hyviksi arvioisit tvt:n (tieto- ja viestintätekniikka) käyttötaitosi?

Erittäin hyviksi Hyviksi Kohtalaisiksi Heikoiksi

Nimeäsi ja ryhmääsi kysytään ainoastaan tutkimustarkoituksiin. Sinua tai muita yksittäisiä vastaajia ei voida tunnistaa tutkimuksesta.

52. Kurssi ENA3.5 / ENA6.3 / ENA11.4 / ENA3.1 / ENA3.6

53. Sukupuoli Mies / Nainen / Muu

54. Etunimi _____

55. Sukunimi _____

Appendix B: Questionnaire in English

Tähän lomake englanniksi

Classroom motivation in the English classroom

This study looks at students' classroom motivation. In the questionnaire you will be asked to think about both your overall attitudes towards studying English, and specific classroom tasks you have taken part in during this course.

Answer the following questions by choosing the alternative closest to your opinion. The questionnaire measures motivation, so there are no right or wrong answers. Please answer all of the questions. You may elaborate on your answers in the comment sections if you wish.

The survey is confidential. Your answers can not be traced back to you or any other single student, and the name of the school will not be mentioned in the thesis. Only the researcher will have access to your answers and even your teacher will not see the answers. The data will be destroyed once it has been processed and analysed.

This questionnaire is part of a pro gradu thesis for English Philology in the Department of Modern Languages. The researcher is Anna Kamula and the supervisor is Anna Solin. If you have any questions about the study, please contact the researcher (anna.kamula@helsinki.fi) or send a message via your English teacher.

Classroom tasks

For every classroom task type mentioned below, think how much it engages and motivates you to take part in it. The task types mentioned are broad categories, so do not focus on for example what specific topic you covered when doing it, but rather focus on whether that task type in general motivates you to take part and engage in the classroom.

Answer the following questions by choosing the option closest to your opinion:

-3. Diminishes my motivation to take part in the classroom **very much**
-2. Diminishes my motivation to take part in the classroom **quite much**
-1. Diminishes my motivation to take part in the classroom **somewhat**
0. **No effect** on my motivation to take part and engage in the classroom
1. Motivates me **somewhat** to take part in the classroom
2. Motivates me **quite much** to take part in the classroom
3. Motivates me **very much** to take part in the classroom

How much do these task types motivate you to actively engage and take part in class:

	-3	-2	-1	0	1	2	3	I don't know/doesn't apply
1. Listening comprehension								

2. Individual grammar exercises (from the textbook or a handout)								
3. ICT (Information and communication technology) use in teaching (e.g. tablets, smart phones, computers)								
4. Written translation								
5. Playing games from the textbook								
6. Quizlet vocabulary drill game								
7. Reading texts out loud in class								
8. Producing films during the course								
9. Following the textbook								
10. Teacher-led conversations								
11. Conversations in pairs								
12. Padlet-wall for collecting comments								
13. The traditional word test on paper								
14. Online course platform (Google Drive, Facebook)								
15.Conversations in small groups								
16. Smaller group projects (E.g. short speeches or plays rehearsed and performed in class								
17. Teacher-produced handouts								
18. Using the Internet and other kinds of technology-related resources to do research in class								
19. Performing and/or presenting small group projects in front of the class								
20. Longer project that require work over several lessons (E.g. portfolios)								
21. Vocabulary exercises from the textbook								
22. Oral translation								
23. Self-evaluation during the course								
24. Questionnaires and quizzes using a smart phone (Kahoot)								
25. Online word tests (Socrative)								
26. Learning vocabulary from the textbook								
27. Interactive fiction games (job interview simulation, driving license game)								

Comments?

_____

Attitude toward studying English

28. My motivation to learn English in order to interact with English speaking people is:

Weak						Strong

29. My attitude toward English speaking people is:

Unfavourable						Favourable

30. My interest in foreign languages is:

Very low						Very high

31. My desire to learn English is:

Weak						Strong

32. My attitude toward learning English is:

Favourable						Unfavourable

33. My attitude toward my English teacher is:

Favourable						Unfavourable

34. My motivation to learn English for practical purposes (e.g. to get a good job) is:

Weak						Strong

35. I worry about speaking English outside of class:

Very little						Very much

36. My attitude toward my English course is:

Favourable						Unfavourable

37. I worry about speaking in my English class:

Very little						Very much

38. My motivation to learn English is:

Very low						Very high

39. My parents encourage me to learn English:

Very little						Very much

Comments?

_____

In the beginning of the questionnaire you were asked to evaluate the effects of different classroom tasks in terms of how well they motivate and engage you in class. In this part you can elaborate your answers.

40. ICT (Information and communication technology) use in teaching (e.g. tablets, smart phones, computers)

_____

41. Quizlet vocabulary drill game

_____

42. Producing films during the course

_____

43. Padlet-wall for collecting comments

_____

44. Online course platform (Google Drive, Facebook)

_____

45. Questionnaires and quizzes using a smart phone (Kahoot)

_____

46. Online word tests (Socrative)

Background information

Estimate how often you use the following appliances outside school:

	Never	Monthly	Weekly	Daily
47. Smart phone				
48. Tablet computer				
49. Laptop computer				
50. Table top computer				

51. Estimate how good your ICT skills in general are:

Very good Good Reasonably good Poor

Your name and group are only asked for research purposes. You or any other individual cannot be identified from the study.

52. Course ENA3.5 / ENA6.3 / ENA11.4 / ENA3.1 / ENA3.6

53. Sex Male / Female / Other

54. First name _____

55. Last name _____

Appendix C: Correlation matrix

Correlations

		AMTB	ICT	Non-ICT	Traditional	Projects	Social	Oral	ICT use	ICT skills	Course grade	Gender
AMTB	Pearson Correlation	1,00	,248*	,538**	,396**	0,16	,333**	,197*	0,03	-0,03	0,00	0,12
	Sig. (2-tailed)		0,04	0,00	0,00	0,07	0,00	0,03	0,78	0,77	0,97	0,18
	N	126,00	67,00	126,00	126,00	126,00	126,00	126,00	126,00	125,00	102,00	122,00
ICT	Pearson Correlation	,248*	1,00	,280*	0,00	,290*	,490**	-0,21	,250*	,260*	0,02	-0,05
	Sig. (2-tailed)	0,04		0,02	0,99	0,02	0,00	0,09	0,04	0,03	0,88	0,70
	N	67,00	67,00	67,00	67,00	67,00	67,00	67,00	67,00	67,00	46,00	66,00
Non-ICT	Pearson Correlation	,538**	,280*	1,00	,681**	,461**	,466**	,413**	0,01	0,10	0,04	0,01
	Sig. (2-tailed)	0,00	0,02		0,00	0,00	0,00	0,00	0,89	0,28	0,70	0,88
	N	126,00	67,00	126,00	126,00	126,00	126,00	126,00	126,00	125,00	102,00	122,00
Traditional	Pearson Correlation	,396**	0,00	,681**	1,00	-0,03	0,02	0,05	-0,01	-0,02	-0,08	0,12
	Sig. (2-tailed)	0,00	0,99	0,00		0,75	0,85	0,56	0,92	0,82	0,43	0,18
	N	126,00	67,00	126,00	126,00	126,00	126,00	126,00	126,00	125,00	102,00	122,00
Projects	Pearson Correlation	0,16	,290*	,461**	-0,03	1,00	0,07	0,09	0,08	0,07	-0,01	-0,08
	Sig. (2-tailed)	0,07	0,02	0,00	0,75		0,46	0,30	0,39	0,46	0,92	0,40
	N	126,00	67,00	126,00	126,00	126,00	126,00	126,00	126,00	125,00	102,00	122,00
Social	Pearson Correlation	,333**	,490**	,466**	0,02	0,07	1,00	0,10	0,08	,234**	0,09	-0,14
	Sig. (2-tailed)	0,00	0,00	0,00	0,85	0,46		0,27	0,38	0,01	0,36	0,14

	N	126,00	67,00	126,00	126,00	126,00	126,00	126,00	126,00	125,00	102,00	122,00
Oral	Pearson Correlation	,197*	-0,21	,413**	0,05	0,09	0,10	1,00	-,200*	-0,08	,321**	0,01
	Sig. (2-tailed)	0,03	0,09	0,00	0,56	0,30	0,27		0,03	0,39	0,00	0,95
	N	126,00	67,00	126,00	126,00	126,00	126,00	126,00	126,00	125,00	102,00	122,00
ICT use	Pearson Correlation	0,03	,250*	0,01	-0,01	0,08	0,08	-,200*	1,00	,328**	-0,06	-0,11
	Sig. (2-tailed)	0,78	0,04	0,89	0,92	0,39	0,38	0,03		0,00	0,56	0,23
	N	126,00	67,00	126,00	126,00	126,00	126,00	126,00	126,00	125,00	102,00	122,00
ICT skills	Pearson Correlation	-0,03	,260*	0,10	-0,02	0,07	,234**	-0,08	,328**	1,00	0,05	-,306**
	Sig. (2-tailed)	0,77	0,03	0,28	0,82	0,46	0,01	0,39	0,00		0,61	0,00
	N	125,00	67,00	125,00	125,00	125,00	125,00	125,00	125,00	125,00	101,00	121,00
Course grade	Pearson Correlation	0,00	0,02	0,04	-0,08	-0,01	0,09	,321**	-0,06	0,05	1,00	-0,09
	Sig. (2-tailed)	0,97	0,88	0,70	0,43	0,92	0,36	0,00	0,56	0,61		0,37
	N	102,00	46,00	102,00	102,00	102,00	102,00	102,00	102,00	101,00	102,00	99,00
Gender	Pearson Correlation	0,12	-0,05	0,01	0,12	-0,08	-0,14	0,01	-0,11	-,306**	-0,09	1,00
	Sig. (2-tailed)	0,18	0,70	0,88	0,18	0,40	0,14	0,95	0,23	0,00	0,37	
	N	122,00	66,00	122,00	122,00	122,00	122,00	122,00	122,00	121,00	99,00	122,00

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

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