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“THE MIND IS NOT A VESSEL TO BE FILLED BUT A FIRE TO BE KINDLED”
TEACHERS’ PERCEPTIONS OF BRIDGING SCHOOL AND WORKING LIFE WITH ICT

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**Abstract**

Globalization, digitalization and ubiquitous technology have changed the way people work, play, live and learn. The vast changes in society and working life make meeting the needs of the 21st century challenging for education systems. Despite information technology is providing various sources to receive information about working life, insecurity is increasing among youngsters in the moment when they should decide about their future professions.

The aim of this research was to investigate the teachers’ own perceptions and main challenges related to this matter, and the goal was to find out if ICT can bring schools and working life closer to one another. This was a mixed-method research using grounded theory as a research approach, and the quantitative and qualitative data was collected by online survey. The theoretical framework combined the concepts of educational usage of ICT and digital media. Also the altering needs of working life and the 21st century skills built an essential part of the theoretical frame, as well as teachers’ and learners’ views about the needs of working life. The informants of this research were high school and upper secondary school teachers, student counselors and principals working in the Oulu area. They were chosen by using simple random sampling, and in total 31 informants participated in this research.

Based on the findings, teachers agree schools’ cooperation with working life is important, but the shortages of educators and learners ICT skills, also the lack of information about the existing digital tools, are often preventing the educational usage of ICT in bridging schools with working life. In the findings teachers also address the ways they would most like to receive ICT training and information about school and working life cooperation.

The limitations of this research lie in the fact that it was limited to 31 participants. However, as the data was collected with an online survey containing multiple quantitative and qualitative questions with open-ended answers, the responses gave diverse insights and provided local perspective about current issues relating to the topic of this research.

The conclusions of this research highlight that even though ICT is just one tool in education and learning processes, ubiquitous technology is everywhere and it should not be neglected neither in teaching nor learning. The majority of teachers feel positively about using ICT in education, but they wish to train those skills, and to learn more about the existing digital tools for school and working life cooperation. Conclusions suggest that the goal of teaching and learning should enhance skills such as collaboration, communication, creativity and critical thinking to meet the needs of the 21st century and working life, and to build individuals’ career paths. Future research is recommended to focus on investigating the existing procedures in ICT skills for mapping out the current gaps in education. Another suggested topic for further research is to investigate the importance of individuals’ passion for learning, and how the current education system could enhance it.

**Keywords**  
Career counseling, Digitalization in education, Educational usage of ICT, Ubiquitous technology in learning, School and working-life cooperation, 21st century skills
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1 Introduction: The digital era challenging education

Globalization with information and communication technology has changed twenty-first century business and everyday life, but most educational systems still operate like they did in the beginning of the twentieth century (Kukulska-Hulme 2010, Kozma and Roth 2012). As many researchers and developers of education are now exploring more effective approaches to learning, education is slowly moving towards the digital age.

Another challenge for education is 21st century working life with its constantly changing and unpredictable expectations. This sets high demands for career counseling. Mark Savickas et al. (2009) declare that in the beginning of 21st century, a new social arrangement of work posed a series of questions and challenges to scholars who aim to help people develop their working lives. As today occupational prospects are less definable and predictable, job transitions are more frequent and difficult. These changes require workers to develop skills and competences that differ substantially from the knowledge and abilities required by 20th century occupations. Insecure workers in the information age must become lifelong learners, who can use sophisticated technologies, embrace flexibility rather than stability, maintain employability, and create their own opportunities.

According to Savickas et al. (2009), all this created a crisis in career development models and methods, and the core concepts of 20th century career theories and vocational guidance techniques must be reformulated to fit the postmodern economy as the current approaches are insufficient. Therefore the new relationship between the worker and the work world creates the need to develop and apply new systems of personal promotion, and the main issues in career counseling of today should be focusing on the questions such as how to match individuals and occupations. (Savickas, M. L., et al., 2009)

In the field of education, there is intense discussion about educational use of information technology, and how ICT should be integrated into teaching and learning. The Survey of Schools - ICT in Education - research conducted by the EU which compared the educational usage of ICT in Europe, (European Comission 2012, 2013) suggests that, compared to other European countries, our schools in Finland have excellent technological equipment, but the pedagogical thinking in schools has not advanced in parallel with other technological advances. (Sipilä 2013, p. 5).
My own interest towards technology enhanced learning and developing career counselling increased while I was working in the development project run by Economic Information Office (TAT) in 2012-2014. The main goal of that project was to promote school and working life cooperation, and to introduce some new information technology tools for school and working life cooperation. Besides students, main target groups of the project were the teachers and the student counselors at high schools and upper secondary schools working in the area of Northern Finland.

During this project, I had begun my studies at the University of Oulu in the Faculty of Education. Working in the development project and studying the topics simultaneously offered a dual perspective on the phenomena occurring in the fields of teacher training and university developments, and the actual work of teachers and student counselors. I discovered a paradox in the situation, where students at the point of making their career choices wanted to hear more about working life. However, they were not able to receive enough information about working life as studying in the high school and upper secondary school focuses on the subjects, not the future steps. Keeping up with rapid changes in working life is also a challenge to career counseling. In my work, I for example promoted many digital tools that were designed for helping students to get up-to-date information about future possibilities. Yet the opportunities of educational usage of ICT were taken as a part of teaching unsystematically in schools, as some had advanced procedures as others rarely used ICT for educational purposes. To gain deeper knowledge on how ICT brings school and working life closer to one another, I decided to make this thesis about the matter.

This research focuses on the ways that ICT is used nowadays in teaching and in student counseling. The main purpose of this research was to find out if ICT can bring school and working life closer to one another. The goal was to investigate what the teachers’ own perceptions are and today’s main challenges related to this matter.
2 Theoretical Framework

2.1 ICT, digital media and its potential for learning

Most recent debates in the field of education are concerned with whether ICT and digitalization are threats or offer possibilities for learning, having opinions for it, against, and everything in between. In his book “Grown up Digital” Don Tapscott presents a very positive view of the new digital media (NDM).

The early evidence suggests that the digital immersion [for youth] has a tangible, positive impact. Not only do video game players notice more, but they have more highly developed partial skills the Net Gen mind seems to be incredibly flexible, adaptable and multimedia savvy. (Tapscott, 2008, p. 98)

Consensus on this matter is rarely to be found among educators. While others see digitalization and ICT as a solution that answers the needs of the 21st century, others are concerned things such as NDM actually making people, according to Bauerlain (2009), "dumber". He argues that mentors are relying on a tool that only scratches the surface of students’ minds; therefore students are not challenged anymore to research answers in books or to struggle and persevere through challenges to achieve success. Teachers get information to students quick and easy, therefore students want their work and good grades to be quick and easy. According to Bauerlain,

The students need a long foreground of reading and writing, a home and school environment open to their development, a pipeline ahead and behind them. They need mentors to commend them when they’re right and rebuke them when they’re wrong. They need parents to remind them that social life isn’t everything, and they need peers to respect their intelligence, not scrunch up their eyes at big words. (Bauerlain 2008, p. 203)

Indeed, if digital tools are used only for copy-pasting the needed information from the Internet, leaving the critical thinking, procession and absorption of the information out, the learning does not penetrate the learner’s mind and it can lead to these types of unwanted results. Pedagogical approaches must always be taken into account in order to ensure that actual learning occurs. Teachers’ role in the process of learning is essential.
Weigel, Straugh and Gardner investigated in the “New Science of Learning” (2010), the potential of NDM in education. In their research for the Developing Minds and digital media (DM2) project, they wanted to secure a more holistic record of changes related to NDM. Their research was driven by the basic question of whether NDM may, or may not, be impacting the way youth think and behave. They focus particularly on changes in students’ "habits of mind", which are mental models that underline and direct how people engage with the world. They found, that NDM can engage students and provide unprecedented tools for expanding intellectual and social opportunities. They can also bestow upon their adolescent users enhanced authority, considerable freedom, and a high level of engagement via the relatively safe parameters of a screen inter-face. Conversely, NDM have been associated with fracturing attention spans and inadvertently encouraging less meaningful and more distant interactions with both people and information." (Weigel et al., 2010, p.18)

Paul A. Kirschner and Jeroen J. G. van Merrienboer (2013) pointed out that students are really not the best managers of their own learning with respect to navigating through in the digital world or choosing the best way to study and learn (i.e., learning styles), also struggle with gathering useful information from the Internet. Kirschner and van Merrienboer argue, that:

There are no “single methods” in education, or in any other complex human system, which work well for all goals under all conditions, and that when developing education, we must be cautious not to base developments in legends or pseudoscience. As the field of education is enormously complex system, the developments should be reflected in its theories that rely on long-term researches using a broad variety of research methods ranging from qualitative, explorative studies to large-scale, randomized controlled trials. (Kirschner and Merrienboer, 2013, p. 179)

Whether NDM is seen as the problem or the solution to current the educational system, the same challenges remain to be determined. Nevertheless, educational usage of ICT and NDM is and continues to have a major influence on young people’s lives. The question at hand for educators is how to make the best out of the situation and utilize the digital tools as one part of education alongside the other existing methods.
The danger of overestimating the possibilities that ICT and digitalization provide to education is relevant. Despite its advantages and potential, ICT is just a tool for learning. In the age of information overloads, the importance of a teacher in the learning processes is even greater. For students navigating in the endless spaces of information, it can be a blindfolded and dangerous journey without guiding lights who can lead the way to valid sources of information. Everything and anything can be justified in the networks of the Internet, and valid information is not always easy to find.

2.2 Working life and 21st century skills

In 21st century working life there is a rapid shift regarding the ways people work. Outsourcing services across national and continental borders and working via international networks around the same project is already a common way of working e.g. in ICT businesses. To support these examples of moves toward globalization, communication and collaboration skills should be fundamentally improved. Communication must be rapid, concise, and aware of cultural differences. Communication and social skills are challenged when working in groups with people who might come from various ethnic backgrounds. The workers should be aware of the effects their work has on local and global levels.

Binkley et al. (2010) defined the ten most essential 21st century skills that are needed for succeeding in the information society. They have grouped those skills in four categories: Ways of thinking, Ways of working, Tools for working and Living in the world. Ways of thinking today include things such as the ability to create and innovate, critical thinking i.e. validating the information, problem solving, decision making, learning to learn and metacognition. Ways of Working emphasize skills such as communication and collaboration. Tools for working in the 21st century are information literacy and ICT literacy. Living in the world concerns understanding citizenship including both local and global dimensions, perception of life and career, and personal and social responsibility including cultural awareness and competence. (Binkey et al., 2012, p. 18-19).

Scardamalia, Bransford, Kozma, and Quellmalz (2012) state that the 21st century skills integrate the learners’ use of a range of technologies over the variety of contexts and domains in the learning environments. The learner’s ability to select and use appropriate technologies during processes such as innovation, communication, collaboration, problem solving, and critical thinking is central to using 21st century skills. Technologies offer many possibilities
for designing richer, deeper, and wider-ranging learning activities and assessments. Possibilities for technology-supported reform of learning environments and assessments include:

- Provision of authentic, rich, and dynamic environments
- Access to collections of information sources and expertise
- Use of formal and informal forms of collaboration and social networking
- Presentation of phenomena, which are difficult or impossible to observe and manipulate in classrooms
- Examples of temporal, causal and dynamic relationships “in action”
- Allowing multiple representations of stimuli and their simultaneous interactions (e.g., data generated during a process)
- The use of overlays of representations and symbols
- Student manipulations/investigations and multiple trials
- Student control of pacing, replay and revision
- Making student thinking and reasoning processes visible
- Capturing student responses during activities (e.g., research, design and problem solving)
- Allowing the use of simulations of a range of tools (Internet, productivity and domain based)

(Scardamalia et al., 2012)

In the information society fewer and fewer jobs are done in isolation, and it is essential to develop one’s individual competence. Yet competence is built in relation to others and it is used as part of a whole. Work life is based on teams that work together to solve a problem or to create something new. Social skills are one of the main abilities needed in the working life, including the capacity to form contacts with people in multicultural networks, to discuss, to understand the viewpoints of others and to listen. (EK 2011, p. 9).

In Finnish upper secondary school the emphasis of education has shifted more towards broad-based subject areas and taking the society around us into account, instead of traditional studying of subject-specific content. Yet some steps remain to be taken. Saukkonen’s (2013) study found the following:
The ideal of broad-based learning is still quite far from the reality of the daily life of upper secondary schools, as schooling at this level is still a fragmented mosaic based on the division into different subjects and courses. The long history of this type of school and especially the strong position of the matriculation examination are still reflected in the daily school life. (p. 9)

In his study “Well that’s how things really are in the world of work!” Saukkonen investigated the development of workplace cooperation in an upper secondary school project in Central Finland.

Saukkonen states, that schools should consider increasing, broadening, and deepening the use of the practices that would increase cooperation with enterprises, the public sector and cultural spheres alike.

Related to working life and 21st century skills, the Ministry of Education and Culture of Finland sets national objectives for the future developments in education:

Students should be equipped with the knowledge and skills required for further studies and working life. It is forecast that with the future changes society and working life will alter considerably, which in turn will bring new challenges for education. Developments in information technology, in particular, are expected to overhaul the occupational structure and competencies required in society over the next two decades. (Ministry of Education and Culture of Finland, 2013, p. 7)

By bridging schools and working life, current information about the various possibilities that exist in working life can be exposed. ICT provides a way for every individual to seek information related to their own area of interest and serves as tool that makes new ways of learning possible. Yet the teacher remains a key factor in creating conditions where the students can learn by using these tools and environments sufficiently.

2.3 Teachers’ viewpoints about school and working life cooperation in Finland

In 2014, The Economic Information Office (TAT) together with the Trade Union of Education in Finland (OAJ) conducted a research for finding out what the teachers of elementary school, senior high school, and vocational school think about the Finnish education system. According to the findings, teachers need more practical training, experiences, and connections to the business life. Finnish teacher training does not provide enough information about
school and working life cooperation either. Even though school can give theoretical information and encourage students to continue their studies after compulsory education, it is not able to adequately strengthen the creativity, problem-solving or entrepreneurship skills.

Teachers felt that the most important skills in working life are collaboration, social skills, and attitude. (Taloudellinen tiedotustoimisto TAT, 2014b).

Organizing face-to-face visits to the workplaces can sometimes be challenging for the schools due to tight schedules, economics or logistical reasons, and finding companies to visit can be difficult especially in the rural areas of Finland. Therefore, ICT tools such as websites, social media, videos, virtual visitors, virtual meetings, and learning environments provide cost-effective and also individual interest-centered ways to get current information about the needs and opportunities that exist in working life.

### 2.4 Finnish learners need more information about working life

For a while now the national curriculum of Finland has encouraged schools to cooperate with working life and businesses as a part of normal school work. Methods vary, but traditionally cooperation has included study visits to different workplaces executed by teachers, principals, student counselors or students. Representatives from working life can come to schools to talk about the possibilities their work place and profession offer. Also, there can be joint projects, working life events, and seminars. The environments outside the classroom can serve as learning environments for pupils and students during workplace orientation or on-the-job learning periods. (Finnish National Board of Education, 2004).

Although there are more information sources than ever before, rapid changes occurring in working life makes career planning problematic. Annually for the past ten years the Economic Information Office (TAT) has asked high school and upper secondary school youngsters about their future plans and career choices. According to those studies (e.g. TAT Nuorisotutkimus 2006-2011, Nuoret ja Työelämä 2012, Valmistu töihin! – Mihin? 2012, Kun koulu loppuu 2013 - 2015), the majority of Finnish senior high school students think they need more information about the working life in school to be able to decide about the future and careers. Students feel that information is distributed well by the student counselors, but that the information about working life should be a part of every teachers’ work and
taught within the subjects at school. Students suggest that the motivation towards the subjects taught at school would increase, if the connections between the school subjects and working life were made visible. (TAT Nuoret ja työelämä, 2012, p. 69).

The most recent 2015 TAT survey “Kun koulu loppuu – when school ends” shows, that taking the next steps after high school or upper secondary is causing more anxiety than ever before among youngsters. In total 7200 high school and upper secondary school students responded to the survey. According to its findings the number of students who plan to take a year off before continuing their studies has increased. In the previous years 2013 and 2014 one out of five (20 %) students reported taking the year off after upper secondary school. Now the number is one out of four, as 26 % of students report they will take a year off after upper secondary school.

There are many reasons causing the rise in anxiety. In Finland, the process of applying to the higher education institutions has changed due to recent renewals of the application system. Now the choices students make are more crucial than before. The renewal of the studying system has also made switching from one study place to another more difficult, and as the needs of constantly changing working life sets own demands, youngsters are in a position that makes career planning increasingly difficult.

According to the Kun koulu loppuu (2015) survey, 77% of upper secondary school students say that there is not enough or no information about working life at school, and 70% hope to get more information and learn more about working life during their studies. Youngsters would like to hear information about different fields of work and the specific duties especially directly from working life professionals. At the end of their studies in upper secondary school, when the choice about careers should be made, only 16 % of students know the working life field they want to aim for. The fear of making the wrong career choice is paralyzing, and the number of insecure youngsters planning to take time off from studying before making their career choice is increasing. (TAT Kun koulu loppuu, 2015).

The Ministry of Education and the majority of students and teachers clearly agree that the schools should cooperate more with working life. Not only because it could make career planning easier, but also for staying updated about what kinds of qualifications working life expects from the students. ICT and educational digital services provide a cost-effective, time saving ways for schools to retrieve up-to-date information about working life. Besides companies’ websites, there are numerous ways to get information from different companies.
There are games and services for youngsters to discover their own path or future jobs. Virtual tours and visits to workplaces make study visits possible even to those places that cannot for instance for security reasons take visitors. By using distance connection systems, live visitors from workplaces can be brought to the school class from all over the world.

These kinds of services already exist in Finland. For example in TAT’s Asiantuntijaverkosto.fi – (network of experts) where currently (23.4.2015) 146 people from different workplaces around the world wait to be invited to the classroom for a virtual visit to talk with the students about their profession. Yet many of these types of services are rarely being used, and this thesis studies what the obstacles are remaining for exploiting the possibilities that ICT could provide for better school and working life cooperation.

2.5 Educational use of ICT in Europe and Finland

The Survey of Schools – ICT in education research conducted in 2011 by the European Commission benchmarked access to, use and attitudes towards the ICT in schools in 31 countries. Based on over 190,000 responses from students, teachers and principals the survey provided a picture of educational technology in schools: from the infrastructure provision to use, confidence and attitudes. The findings showed that ICT provision and use in European schools is improving but several obstacles remain. The Survey of Schools exposed the following key findings in the EU area:

First, teachers still believe that insufficient ICT equipment is the biggest obstacle to ICT use in many countries, but according to the survey the equipment level in schools is actually advanced. There are now between three and seven students per computer on average in the EU. Interactive whiteboards are in general present in many schools (over 100 students per interactive whiteboards) as well as data projectors. More than nine out of ten students are in schools with broadband Internet access with speeds varying commonly between 2 and 30mbps. Most schools are connected at least at basic level.

Second, though teachers are using ICT mainly for preparing classes, and educational usage of ICT in the classroom is still infrequent. ICT training for the teachers is rarely compulsory and most teachers devote their own spare time to private study. Most teachers have been
familiar with ICT for teaching and learning for some years, but still use it first and foremost only to prepare their teaching. Only a few use it – and still to a limited extent – to work with students during lessons, and even less frequently to communicate with parents or to adjust the balance of students’ work between school and home in new ways. The overall frequency of use of different types of ICT-based activities in class reported by teachers is around several times a month on average at EU level.

Thirdly, The Survey of Schools shows that the students and teachers who have the highest use of ICT learning-based activities occur when schools combine the ICT policies in teaching and learning. However, most schools do not have such an overarching ICT policy. Therefore it is not surprising that many teachers wish for radical change to take place for ICT to be fully exploited in teaching and learning. Majority of the school heads and teachers agree on the relevance of using ICT in learning activities as well as having positive impact of ICT use on students’ motivation and achievement and on transversal and higher order thinking skills. They are also close to unanimity about the fact that ICT use is essential in preparing the students to live and work in the 21st century. An overwhelming majority of students are also positive about the impact of ICT on the classroom atmosphere and on different learning processes. (European Commission, 2013)

From the Finnish perspective, educational usage of ICT in Finland turned out to be weaker than expected. According to the survey, Country Profile of Finland (2012), despite the fact that students enjoy the highest levels in Europe of ICT infrastructure provision, high speed broadband connectivity and ‘connectedness’, Finland is below the EU average in the educational usage of ICT. Finland does not have the policies that enforce ICT in teaching and learning or teacher training, and also 60% of the schools have weak support for conducting digital learning in their school.

Also the concept of the ‘digitally supportive teacher’ referring to educators with high confidence in and a positive attitude towards ICT, Finland is ranked among the lowest (bottom 4) from the other 31 countries compared in the survey.

Analysis of the whole data in the Survey of Schools: ICT and education: Country profile Finland suggests a so called 5C approach to addressing issues identified in the survey:

1) Capacity building, through sustained investment in teachers’ professional development
2) Concrete support measures, accompanying specific policies at school level

3) Combined policies and actions, in different policy areas within a systemic approach

4) Country specific support, addressing large differences and degrees of ICT provision and implementation

5) Competence development; these four actions directed at increasing effectively and dramatically young people’s digital competence and the key competences described in the European framework. (European Schoolnet and University of Liège, 2012)

Keijo Sipilä investigated ICT usage in Finnish schools in his doctoral thesis “No Pain no Gain: Educational Use of ICT in Teaching, Studying and Learning Processes: Teachers’ and Students’ Views.” According to his findings, teachers in Finland use ICT mostly for administrative tasks. Teachers' methods of utilizing student-centered approaches in their teaching, proficiency levels in relation to ICT, and their self-reported stage of ICT integration into teaching strongly depend on how much ICT teachers use in their teaching activities. Today teachers in basic education still use ICT mainly for informational, organizational, evaluative, and lesson-planning activities instead of communicative, activating, creative and expressive purposes.

In order to utilize ICT in teaching in a way that is pedagogically supported by the modern conception of learning as a socio-constructivist activity, teachers should use a student-centered approach in their teaching. According to Sipilä’s study, only a fraction of the respondents have adopted new ways of teaching. The teachers who reported using computers more frequently in their teaching were inclined to use a more student-centered approach in their teaching. (Sipilä, 2014).
According to the previously presented research and reports, information about working life is much needed by students and teachers at schools for making the career choices easier and for meeting the demands of the 21st century. ICT could provide one way for promoting the cooperation, but the educational use of ICT has not yet become equally common in teaching and learning.

The digital wave sweeping the shores of education is reaching the schools unequally. As I was working with the student counselors, principals and the teachers from different schools in the area of Northern Finland, I saw vast differences in practices and attitudes towards school and working life cooperation. Also, the educational usage of ICT between schools varied greatly from non-existent to frequent use.

As the situation is constantly changing, I decided to make a survey for mapping out the current practices that the teachers have for school and working life cooperation. It was necessary to ask the teachers for their perceptions about using ICT in their teaching as well to see which digital services and websites teachers currently use for school and working life cooperation.

The main question was to find out, if information and communication technology bring school and working life closer to one another.

The complete questionnaire, having 21 questions in total, is presented in Appendix 2. There were four main themes in the questionnaire, beginning with “working life cooperation in school”. This was formed for finding out the educators’ perspectives of the importance of school and working life cooperation in general. Also, it was meant to learn about the ways students get the information about working life today.

Under the themes “The usage of ICT in school and working life cooperation” and “Building bridges with ICT from school to working life” I inquired into the teachers’ opinion about ICT: how do they feel about using ICT in teaching, what kinds of ICT equipment do they have, and can ICT support school and working life cooperation, with a request that explain their answer by open-ended question. Also, I wanted teachers to map out the online services and websites they currently use in school and working life cooperation. Furthermore, my intention was to learn about the teachers’ opinions, that is, which ways do they feel that
school and working life can be promoted in schools. One question was to discover the current challenges and obstacles for performing cooperation between schools and work.

For investigating the teachers’ preferences on how would they like to receive information about educational usage of ICT and receive information about the school and working life cooperation, a question about the most suitable ways of ICT training was formed. The purpose of this question was to find out which applications the educators need more information about, and to discover suggestions for developing ICT training for teachers.
4 Research methodology

In this chapter I describe the research methodology and the methods used in this study, while reflecting upon those theories in relation to this research. My research material consists of teachers’ written answers to the questionnaire containing both qualitative and quantitative data sequentially, that is, I used a mixed-methods approach. According to Creswell, the mixed-methods approach is pragmatic for knowledge claims and collection of both quantitative and qualitative data. Mixed-methods research includes open- and closed-ended questions and multiple forms of data drawing on all possibilities, including statistical and text analysis. (Creswell, 2003).

For analyzing the qualitative part of the research data, the content analysis approach was adopted using grounded theory. In the quantitative part, the descriptive analysis method was used.

Grounded theory is a form of qualitative research developed by Glazer and Strauss (1967) for the purpose of constructing theory grounded in data. Grounded theory, where the researcher attempts to derive a general, abstract theory of a process, action, or interaction grounded in the views of participants in a study, the process involves using multiple stages of data collection and the refinement and interrelationship of categories of information. (Creswell, 2003.) Grounded theory allows for identification of general concepts, the development of theoretical explanations that reach beyond the known, and offers new insights into a variety of experiences and phenomena. (Corbin & Strauss, 2015).

For the quantitative parts, the data was analyzed using the Webropol 2.0 survey and analysis program. The Webropol professional statistics program makes it possible to seek correlations between different variables (for example age groups, professional groups etc.), and comparing, filtering and segmenting the results. It also creates various graphs automatically for the visual reporting of the quantitative data.

4.1 Data collection

I used probability sampling for collecting the data collection of this research. The simple random sample (SRS) is the most basic form of probability sample. With random sampling each unit of the population meaning the universe of units from which the sample is selected, has an equal probability of inclusion in the sample. Sample is the segment of the
population that is selected for the investigation; it is a subset of the population. Sampling frame is the listing of all units in the population from which the sample will be selected (Bryman, 2004, pp. 87 & 90).

Figure 1. The workflow of sampling procedure, delivering the survey to the informants

In this research, the sample frame consisted of high school and upper secondary school principals, student counselors and subject teachers working in the Oulu area and its surroundings. The online link for the survey was sent via e-mail to all the elementary school principals (in total 21) and all the upper secondary school principals (in total 11) working in the Oulu area. The principals forwarded the link to an undetermined amount of student counselors and subject teachers working in high schools and upper secondary schools, and the principals themselves were also included in the sample frame as they were also asked to answer the questionnaire. In Figure 1 below, the sampling procedure is illustrated:

In total 31 teachers responded to the survey: 6 principals, 11 subject teachers, 14 student counselors. Two of the subject teachers were also practicing student counseling as the part of their work. Within the group of respondents, there were 4 males and 27 females. The majority (23) of the recipients were junior high school teachers. The survey was sent out in April 2014, and teachers were given two months in which to answer it. The determined age categories in the questionnaire of the informants were 20-35 years old (four informants), 35-44 years old (five informants), 45-54 years old (thirteen informants), and 55-64 years old (nine informants) the survey was conducted in Finnish (Appendix 1) and it has been translated into English (Appendix 2).
The results of the survey were further processed using the Webropol chart and table tool, and they were transferred from Microsoft Excel, after statistics were created for further content analysis.

4.2 Data analysis

As described before, the main question was to find out, whether the ICT can bring school and working life closer to one another.

For the open-ended parts of the questionnaire, a descriptive content analysis was conducted. Content analysis has been defined as a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Berelson 1952, Krippendorff, 1989).

Content analysis seeks to analyze data within a specific context in view of someone or a group attributes (Krippendorff, 1989, 2012). Formally content analysis is a research technique for making replicable and valid inferences from data to their context of the use. As a technique, content analysis involves specialized procedures, and provides new insights, increases a researchers’ understanding of particular phenomena or informs practical actions. These techniques are expected to be reliable, and should result in findings that are replicable. The methodological requirements of reliability and validity make particular demands on content analysis.

The most suitable data types for content analysis are texts to which meanings are conventionally attributed. The technique is increasingly applied to data that are less public and is applicable for questionnaires that are using e.g. open-ended questions. Content analysis is firmly rooted in the quantitative research strategy in that the aim is to produce a quantitative account of the raw material in terms of categories specified by rules (Berelson 1952; Bryman 2004; Krippendorff 1989).

For analyzing the quantitative data, I used the Analytics 2.0.module of the Webropol Online survey and analysis software, It is convenient way to analyze the data as my survey was conducted with the same tool. In Figure 2, the workflow of how I examined and analyzed the quantitative data with Webropol is visualized:
After downloading the data into the program, it was analyzed by using several data analysis techniques: clustering, grouping, filtering and cross-tabling. The main theme was reformed to “Teachers’ perceptions of bridging schools and working life with ICT”, and the four subthemes were formulated following way:

1) The working life cooperation in school: The significance and the ways of performing school and working life cooperation,
2) The usage of ICT in school and working life cooperation,
3) Bridging schools with working life via ICT and
4) The most suitable ways of conducting ICT training for teachers.

The attempt was to find the key issues arising from the data by reflecting upon the results in relation to the research questions. After browsing the data several times, I chose to categorize it in three ways: by age, by profession (teacher, principal, student counselor), and by attitudes towards using ICT for educational purposes.

After exploring the program’s various analyzing methods regarding the quantitative data, I generated corresponding charts and tables with the Webropol 2.0. Reporting Module. From the qualitative part that consisted of a few open-ended questions, I created an age and attitude matrix, where the corresponding responses from the open-ended parts are presented and categorized using age categories as well. The most relevant issues reflecting the findings of this research are presented in the next chapter, in the results and findings of this research.

Figure 2
The workflow of the quantitative analyzing process with the Webropol 2.0. Analytics module.

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5 Results and findings

5.1 The significance and ways of performing school and working life cooperation

According to the responses, school and working life cooperation is considered to be an important issue among the teachers. There are multiple ways of getting current information about working life. For mapping out the current situation, it was relevant to ask the participants about the ways of getting the information. The scaled question for collecting quantitative data (Q7) was formed “In school students get information about working life...”, and the multiple choices were given with numeral scales, where the teachers could set a value to the given choices.

Figure 3
The teachers’ perspectives about where the students get information about working life

When asked about how current students get information about working life, the results (Figure 3) show that the best way is through working life practice sessions (average 4.07) and the second important method for students to get information about working life is by having discussions with their student counselors (average 4). When categorizing the answers by the professions of the educators (Figure 3), the principals clearly see that working life practice is the best way of getting the needed knowledge about the working life.
Student counselors and principles agree about this. Additionally, principals believe that the best way to get information about working life is through discussions about it with student counselors. Videos and websites providing current information about working life were considered a good way to get information about working life among all three categories: principals, student counselors and the subject teachers as well. Interestingly, the student counselors and the subject teachers feel that the least important way for students to get information about working life is through online visitors from services such as Network of Experts. Also, according to the respondents, the company cooperation is not considered to be a very meaningful source for getting information about working life. Since there might be other ways and means than those listed above to get information about working life, it was relevant to form an additional open-ended question that gave an option for informants to complete the previous answer. Q8 asked informants to continue the following sentence: “In addition, students get information about working life..

- “From the other fellow youngsters.” (Female high school teacher, age group 45-54)

- “By interviewing the professionals, and by cooperating with vocational schools. (Workshops, study visits, virtual visits, visits of student counselors).” (Female high school student counselor, age group 35-44)

- “In class counseling, by sharing experiences of work practice programs.” (Female high school student counselor, age group 20-35)
5.2 The usage of ICT in school and working life cooperation

As the usage of ICT for educational purposes varies, it was a relevant question to ask the teachers their opinions about it. The question (Q9) asked the informants to continue the sentence by using listed options: “Using ICT in teaching...” by selecting one of the given options below.

Figure 4
The teachers’ perceptions of using ICT in teaching

According to responses, (Figure 4) most (16) of the informants responded that using ICT in teaching is rather challenging, and many (9) respondents have found the educational usage of ICT to be difficult, and they have needed ICT support for solving those problems. Only some (5) student counselors chose the option “easy”, so it appears there are still major difficulties in the educational usage of ICT. None of the respondents replied that they are not using ICT in their teaching. The next question was related to the equipment to explore what kinds the ICT equipment informants can and are using in their teaching. The question was formed: Q10 “I have the following ICT equipment I can use in my teaching”
According to the informants, the most common ICT tools in teaching are desktop and laptop computers, video projectors and tablet computers. Interactive whiteboards, web cameras and conference microphones are not very common in schools (Figure 5). When comparing the answers between the principals, student counselors and subject teachers, there were not big differences between the groups with the exception that subject teachers use less laptop computers than principals and student counselors. For investigating the teachers’ satisfaction with their workplace ICT equipment, the open-ended question asked \((Q11)\) \textit{“Is your own workplace equipment satisfactory for responding the needs of teaching?”} In total 23 informants replied to this question. The responses are categorized by professions, and the responses are presented below.

Principals
- “Not really. There should be more ICT equipment.” \textit{(Female upper secondary school principal)}
- “No.” \textit{(Female high school principal)}
- “Yes.” \textit{(Female high school principal)}
- “No.” \textit{(Female high school principal)}

Subject teachers
- “If I had my own classroom, that would be a good starting point for using different kinds of tools. But as a subject teacher I constantly use different classrooms, therefore the equipment are different in each class. The variety of equipment does not motivate for creating new materials, when it can be used by only one class only once a week.” (Female upper secondary school subject teacher)

- “No! We need more technology in classrooms.” (Female high school and upper secondary school subject teacher)

- “No” (Female high school and upper secondary school subject teacher)

- “No, I like to take all new things but I hope my employer would realize the need for training [for using the new technologies.]” (Female high school subject teacher)

- “No.” (Female high school subject teacher)

- “It is not.” (Female high school subject teacher)

- “Below satisfactory.” (Female high school subject teacher)

- “Our [ICT] supplements are constantly improving.” (Female high school subject teacher)

- “Yes, but the main question in the usage [of ICT in learning] is that for example students do not have tablet computers, and in school there is only handful of them as well.” (Male upper secondary school subject teacher)

Student counselors

- “Yes.” (Female upper secondary school student counselor)

- “Yes.” (Female high school and upper secondary school student counselor)

- “Yes, but we could use more tablet computers / faster computers.” (Female high school student counselor)

- “Yes. (Female high school student counselor)

- “Partially.” (Female high school student counselor)

- “We have a computer and video projector, but not a document camera.” (Female high school student counselor)

- “The equipment in my workplace is slightly insufficient, but in class it is ok.” (Female high school and upper secondary school student counselor)

- “It is rather good, but there are differences between classrooms. My own workplace has rather old equipment.” (Female high school and upper secondary school student counselor)

- “Pretty much sufficient” (Female upper secondary school student counselor)

Combination - student counselor and subject teacher

- “Partially yes, but suitable equipment for distance learning we have only in one or two class rooms We don’t have any interactive whiteboards. Yet the shortcomings in my own [ICT]- skills is the greatest challenge.” (Male upper secondary school subject teacher and student counselor)
In the table below (Table 1) the previous responses are summarized and categorized by the respondents’ professions.

Table 1
The teachers’ satisfaction with ICT equipment at schools:

<table>
<thead>
<tr>
<th>Professional</th>
<th>Satisfied</th>
<th>Not satisfied</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Subject teacher</td>
<td>1</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Student counselor</td>
<td>6</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

As it shows (Table 1), the majority of the principals were not satisfied with the ICT equipment in their workplace or classroom. Similar results are to be found among the subject teachers, as it is seen from the open-ended questions above. On the contrary, all the student counselors are mainly satisfied with their ICT equipment in their workplace or class, bringing up only slight shortcomings in their classroom ICT equipment.

5.3 Building bridges between schools and working life with ICT

According to the responses, all the informants clearly agree that ICT can support school and working life cooperation agreeing with the sentence: (Q12) “ICT can bring school and working life closer to one another”. Related to this topic, an open-ended question (Q13) was formed allowing the teachers to explain further the reason for the previous answer relating to the topic can ICT bring school and working life closer to one another. In total 13 responses were given to this question. In order to discover the possible correlation within and between the age groups, I grouped the open-ended answers in the four different age categories and placed the answers in two categories (“positive or neutral/negative”) based on the content of the answer related to the teacher’s attitude towards using ICT in school and working life cooperation. To discover if there is a correlation between age groups, I divided the responses in the age categories, and set the answers into the ICT - positive or ICT – neutral/negative categories in table 2 that is presented below.

Table 2
Teachers’ perceptions about using ICT in schools cooperation with working life
<table>
<thead>
<tr>
<th>Age group</th>
<th>ICT - Positive</th>
<th>ICT - Neutral / Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-35</td>
<td>“ICT IS future working life!” (Female high school and upper secondary school subject teacher)</td>
<td>“ICT tools are not the only way to get information. Often printed guides work better for understanding and digesting the information. Internet texts are being browsed, but according to my experience booklets are read more carefully.” (Female high school subject teacher)</td>
</tr>
<tr>
<td></td>
<td>“With these tools we can handle matters about working life much wider and support the students self-navigating.” (Female high school student counselor)</td>
<td></td>
</tr>
<tr>
<td>35-44</td>
<td>“[ICT tools] make virtual professional and educational presentations possible, the student can search for information about working life from the Internet, students have interviewed professionals using the Internet, also watching videos about different professions and different areas of work has been useful. Students can also search for summer jobs etc. by using the Internet and make electronic portfolios.” (Female high school student counselor)</td>
<td></td>
</tr>
<tr>
<td>45-54</td>
<td>“[By using ICT we] can follow up virtual lectures. It would never be possible to get those experts to school. Many videos are good.” (Female upper secondary school student counselor)</td>
<td>“I think the motivation would increase, if there was personal screen to be offered to everyone.” (Female high school teacher)</td>
</tr>
<tr>
<td></td>
<td>“Students’ direct access to companies’ websites and live – contacts with the personnel in different locations makes wider perspective [in working life] knowledge possible.” (Female high school principal)</td>
<td>“Work place visits are not possible for long distances. It requires a lot of beforehand organizing and funding.” (Female high school student counselor)</td>
</tr>
</tbody>
</table>
When looking at the contents of the two previous answers (Q12 and Q13) the attitudes about using ICT in school and working life cooperation are mostly positive, and it does not correlate with ages. Some respondents found in all age groups point out that ICT is only a tool for promoting it, and that there are also other ways for students to get information about working life. The next question (Q14) was formed for finding out the websites teachers mainly use for providing the students with information about working life.

<table>
<thead>
<tr>
<th>Age group 55-64:</th>
<th>“We cannot get funding from schools for implementing study visits with the students to the workplaces. So in these kinds of situations ICT is a big help, when study visits outside schools are hard to get.” (Female high school and upper secondary school student counselor)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Virtual study visits and visitors, videos, social media and other medias.”(Female high school subject teacher)</td>
</tr>
<tr>
<td></td>
<td>“If there are multiple ICT tools and a chance to use them, knowledge [about working life] can be increased.” (Female high school student counselor)</td>
</tr>
<tr>
<td></td>
<td>“If the Internet connection is working, we can search for information about companies, for instance.”(Male high school subject teacher)</td>
</tr>
<tr>
<td></td>
<td>“ICT is just a tool. Teachers’ role in guiding the context is more important.” (Male high school principal)</td>
</tr>
</tbody>
</table>
TAT’s website Kunkoululoppuu.fi (When school ends), which provides information about working life for high school and upper secondary school students, was the most popular website for supplementing information about working life at school (Figure 6). Companies’ own websites were the second most used type of website among respondents. Opetin.fi which is built for schools and company cooperation is rather popular as well as Nuoriyrittäjyys.fi, related to entrepreneurship education. Asiantuntijaverkosto.fi designed to invite online visitors to class is not a very common tool among teachers as only four respondents reported using it. For adding more websites that were not listed above, respondents were given the option with the open-ended question: (Q15.) Other web-based services / websites I am using for increasing the knowledge about working life at school: (13 responses)

Student counselors

- ammattinetti.fi mol.fi/avo (Female upper secondary school student counselor)
- http://www.te-palvelut.fi/te/ (Female high school student counselor)
- te-keskus, tet-tori (Female high school student counselor)
- opintopolku, ammatinvalinta, koulutuksen järjestäjien nettisivut, te-toimiston sivut
- ammatinvalinta.fi (Female high school student counselor)
- Mol, opintopolku.fi www.toissa.fi, ammattinetti (Female upper secondary school student counselor)
There are various ways to promote school and working life cooperation. For mapping out teachers’ perceptions about the best practices in working life cooperation, the question (Q16.) asked the teachers to complete the sentence “In my opinion school and working life cooperation can be promoted by...” by giving a scaled answer from 1-5. Results are presented in Figure 7:

Figure 7
Teachers’ opinions about the ways school and working life cooperation can be promoted.

Scale 0 = I don’t know, 1= I disagree completely, 2= I disagree slightly, 3= I agree slightly, 4= I agree completely
The teachers (30 respondents in total) agree that the best way for promoting school and working life cooperation is by bringing working life visitors and experts to class (average 3.43). The principals think that work practice periods are the best way to promote school and working life cooperation. The following ways were also considered good ways of promoting school and working life cooperation: Student counseling discussions, student group study visits in workplaces, informational practice sessions and visits outside schools and students’ parents’ guidance (average 2.73). Career information training days for principals divided the answers the most, and many respondents did not have an opinion about the usefulness of conducting career trainings for principals. Also the online visits in class by experts divided the respondents’ answers almost across every point of the given scale. For finding what is the most challenging thing in practicing school and working life cooperation, a scaled question (Q17) asked teachers to complete the sentence. In school and working life cooperation I find challenging... through giving a scaled answer (scale 1-4). Figure 8 presents the results.

Figure 8

Teachers’ perceptions about the challenges in schools working life cooperation

Scale 0 = I don’t know, 1= I disagree completely, 2= I disagree slightly, 3= I agree slightly, 4= I agree completely

According to the respondents (30 responses in total), the most challenging thing in school and working life cooperation is the lack of resources in organizing the study visits (average 3.63). The second greatest challenge is the rapidly changing needs of working life, (average 3.23).
3.23) and getting the up-to-date information about working life was also considered a challenge in most teachers’ responses (average 2.87). Many teachers would like to have more experts in class, who can bring knowledge about working life to schools (average 2.63). Bringing the working life phenomenon to their own teaching divided the answers the most as some find it very challenging and others see no challenge (average 2.37).

5.4 The most suitable ways for teachers in ICT

One of the obstacles standing in the way for of using ICT in their teaching can be the lack of ICT training for the teachers themselves. Therefore, it was important to ask what kinds of ICT training teachers would hope to have in order to improve their educational ICT skills. When asking the most suitable ways of training teachers in ICT (Figure 9), most of the teachers (20 out of 29) needed a website, on which current ICT matters can be followed. Many also wanted to receive peer counseling in everyday work (18 out of 29), and application training in their classroom was wanted by 16 respondents.

Figure 9
Teachers’ perceptions about suitable ways of receiving ICT training

![Table showing the perceptions of teachers about suitable ways of receiving ICT training](image)

Websites on which the educators could follow the current educational usage of ICT topics and having a peer counselor in everyday work were the two most desirable ways for receiving information about the educational usage of ICT. The teachers also found specific appli-
cation trainings and regular gatherings with brief information sessions, and personal consultation as useful ways to get ICT training. E-mailings and seminars were the least wanted ways of getting ICT education training. For giving space to teachers to express their own ideas about what other kinds of ICT trainings they wish to receive, an open-ended question (Q19). Ideas for developing ICT—training and organizing information sessions about it was formed. Five responses were given to this question in the following way:

- The Internet is full of information, and e-mail keeps getting full of all sorts of things. For a subject teacher there is no time for educating themselves. Within teaching hours there is no time, especially when trying to browse information when feeling tired. One hour of precise training is a more effective way than browsing and trying to learn alone. Despite my age, I do not have the worst ICT skills, I am strong basic user having education as Internet informer. (Female high school subject teacher from the age group 45-54)

- Sharing experiences and ideas for example in workshops are needed. Just lecturing about it is not enough and it does not open items enough. (Female high school student counselor from the age group 35-44)

- Short, compact tips and guidance on internet (why not e-mails also.). Service 8-16., from where can be asked (using online service or phone) and can get an answer right away. Slow trainings without focus or a sense of usefulness are mostly frustrating. (Female high school subject teacher from the age group 55-64)

- Ideas and materials could be “sorted” into types: implemented fast and easy and those that need more skills and time. (Female high school student counselor from the age group 20-35)

According to the responses to questions 18 and 19, rather than having mass seminars and self-regulated learning, teachers prefer customized trainings as the ICT skills vary among teachers. Another mentioned problem for training the educational usage of ICT is the lack of time in their schedules.

For finding out the current exact needs about applications that could be used for educational purposes, the (Q 20) “I would like to get training or supporting material from following
applications:” listing was set. 27 responses were given, and the results are given in Figure 10.

Figure 10

The educational ICT tools and applications teachers wish to learn more about:

Tablet computers in teaching: 29%
Online learning environments: 20%
Social media (e.g. Wiki, Blog, Facebook, Instagram, Twitter): 17%
Remote access programs (e.g. AdobeConnect, Skype, Lync): 18%
Office - tools (e.g. Word, PowerPoint, Excel): 6%
Using e-mail: 1%
Producing websites: 0%

Tablet computers in teaching, online learning environments, social media and remote access programs were the most preferred topics that the teachers would like to learn more about. An open-ended question for adding information to the previous question (Q21) asked: In addition I would hope to get training or supportive educational material about the following software. Two responses were given:

- Such learning materials on the Internet that students can use with their smartphones. (Female high school principal from the age group 45-54)
- Not only technical training, but also ideas about how these tools can be used. (Female high school student counselor from the age group 35-44)

5.5 Summary of the findings

Teachers clearly feel that schools should have closer cooperation with working life for several reasons: the connection from school subjects to working life is strengthened, students
can get up-to-date information about working life for planning their careers more sufficiently, and the students can practice the skills that are needed in working life. Cooperating with working life and businesses also updates the teachers’ knowledge about the constantly altering choices and professions, and they can distribute the information to the students more effectively. ICT can bring multiple additions to the cooperation, but still there are gaps in ICT skills and practices between teachers and schools.

Related the usage of ICT in school and working life cooperation, majority of the informants feel using ICT in teaching is rather challenging or has been difficult. Only 5 out of 31 respondents chose the option “easy”, so it appears there are still major difficulties in the educational usage of ICT. None of the respondents replied that they do not use ICT in their teaching, so clearly ICT is a part of all the respondents’ work nowadays. The majority of the principals were not satisfied with the ICT equipment in their workplace or classroom. Similar results are to be found among the subject teachers, but surprisingly all the student counselors are mainly satisfied with their ICT equipment in their workplace or classroom. The reason for this is not seen in the results, but it could be interesting to investigate further the reasons for this: do the student counselors have better ICT equipment, or do they feel more confident about using the equipment they have?

According to the findings of this research, many teachers and principals feel that one of the best ways to receive information about working life is by executing study visit to workplaces, or by inviting working life visitors to the classroom. Unfortunately the tight school budgets limits the possibilities for organizing these visits. A one solution to this could be inviting virtual visitors from workplaces to the classroom. For instance, The Network of Experts (Asiantuntijaverkosto.fi) is designed for this purpose, where currently (23.4.2015) 146 people from working life wait to be invited to a school classroom for giving insightful information about their workplaces and professions. This all could be organized free of charge by using online distance connection services that most schools already have. Yet, according to the responses of this research, these types of opportunities were not considered to be very useful in the class.

For utilizing these new digital services as a part of teaching, teachers should be confident first of their ICT skills. There are variations from poor to excellent in ICT skills among schools and teachers. It is important to remember, that those skills can vary among students
as well. Collaboration and sharing knowledge about ICT in school classrooms has been found useful in some cases as new applications pop up every day and some students might have useful information that could be shared with others.

Common problems in schools are the tight schedules that do not allow enough time to process and explore all the possibilities ICT can bring, or there is not enough time for ICT skill training. Shortcomings or variations in ICT skills is an obstacle, and teachers gave opinions about how and in what ways the proper training should be organized.

A collective website where the most current educational use of ICT tools and innovations could be found, could be suitable way for distributing information about educational usage of ICT according to the teachers’ responses. Also peer counseling and regular gatherings, where the information about educational usage of ICT could be distributed in brief was named as one of the most suitable ways of receiving ICT training. As the needs for learning and ICT skills vary, personal consultation and guidance are preferred as well.

In general, the results of this research indicate that the possibilities ICT brings for schools and working life cooperation have not yet been fully exploited. Therefore, bridging schools and working life with ICT needs resources especially for ICT training. Mostly teachers feel positive about using ICT for educational purposes, which is a good starting point for further developments.
6 Validity and reliability

Every researcher must consider the issues of validity and reliability in their research. According to Lewis, the qualitative researcher often is perceived as the research instrument, therefore he or she must ensure that the information he or she reports/records is accurate and not oversimplified or misinterpreted. (Lewis, 2009, p. 7)

By conducting a mixed-method research, in which the data was collected by using both qualitative and quantitative methods, my attempt was to increase the validity of this research as it provides two ways of receiving data. However, regardless whether the method was qualitative, quantitative, or combined, at the end the question of validity and reliability relies on the researcher’s own ethics, truthfulness and integrity. Therefore it is important to make the process transparent for others.

Reliability in quantitative research has focused on the concept of consistency, which primarily concentrated on instrumentation and outcome (Shadish, Cook, & Campbell, 2002 in Lewis 2009). According to Lewis,

Quantitative researchers use the concepts of internal validity, external validity, construct validity, and statistical conclusion validity to assess the truthfulness of their findings. Using surveys and inferential statistics, quantitative researchers sample a proportion of a population, with the findings from the sample being inferred as qualities of the entire population. Reliability from the qualitative research perspective refers to “trustworthiness, accuracy and dependability of the findings (Lewis, 2009, pp. 4, 7)

By sending the survey online in a way where informants can choose a convenient time and space for answering the questions without being influenced by the researchers’ presence in the situation, and answers were written by the respondents. The main goal was to minimize the opportunities for misinterpretations.

There were some limitations in this research that should be considered regarding validity and reliability issues. First of all, I conducted this research in an international program using English. Having all my respondents from a Finnish context using Finnish in their responses,
there might be slight mistakes made as translating from one language to another can alter some meanings with words and sentences. For minimizing the risk of linguistic mistakes, I had my text proofread by a native English speaker.

Another limitation of this research was the number of the respondents, 31 in total. It can limit the ability to make broad conclusions especially about the quantile parts so for tackling that issue I left space for the respondents to share their ideas by giving multiple opportunities the informants to respond to open-ended questions. As a result I did receive a reasonable amount of qualitative data that gave wider insights into and understanding about the issues.

When choosing the methods, data collection techniques and the target group of informants, I was in a position I was able to organize and attend many national events and seminars where these questions I am writing in my thesis about were discussed by multiple groups of experts from schools, business life and education development. This experience was an enormous asset while conducting this research, as I was surrounded by the networks of experts, having opportunities to discuss and reflect with them about the issues of my research, and it gave solid ground to investigate further my research questions.
7 Discussion and conclusions

For many years our Finnish education has been in the spotlight for the successes in student performances in the OECD comparisons. Despite some recent setbacks, evidently the Finnish education system is still considered one of the most quality education systems in the world. But what is a true measure of success of a school, of learning and the future? Are we really teaching the skills and the competencies youngsters need for building a future in the 21st century?

The 21st century working life sets whole new demands for education. The rapid speed of changes challenges us to rethink the most essential skills for our schools to enhance.

A video presenting “Vision of K-12 Students Today” suggests, that half of the future jobs, that today’s 12 year old schoolchildren will enter at age of 40, do not exist, as those jobs have not been invented yet (Nesbitt, 2007). The situation is summarized well by the former U.S. Secretary of Education Richard Riley:

We are currently preparing students for jobs that don't yet exist . . . using technologies that haven't yet been invented . . . in order to solve problems we don't even know are problems yet. (Riley in Sipilä 2013).

Even though it must be acknowledged that ICT is just one tool in education and in a learning process, it is something that has radically changed the ways we think, work, learn, live and interact with others. Ubiquitous technology is everywhere, and it cannot and should not be neglected in classrooms, teaching or learning. The vast gaps in ICT skills between the learners and educators should be filled collaboratively. In Finland teachers in basic education still use ICT mainly for informational, organizational, evaluative, and lesson-planning activities instead of communicative, activating, creative and expressive purposes. (Sipilä, 2013). Compared to so called “digital immigrant generation” (Prenzky, 2001) referring to us who were not born surrounded with ubiquitous technologies, today’s Finnish high school youngsters have not only different ways and methods for learning, but also have different equipment they carry in their pockets for accessing any kind of information they want from any place at all times. This provides whole new perspectives for educational usage of ICT. It is remarkable to realize the speed of change; only a decade ago using computers in education
required a teacher to reserve a computer classroom, organizing everything carefully. Within ten years, the situation has changed radically.

The role of teaching is altering; from delivering knowledge towards serving as a mentor who is managing several learning processes. Teachers are expected to encourage, engage, challenge and give positive and critical feedback to the students, to be a co-thinker, co-learner, and co-problem solver. Only the knowledge that is understood is meaningful, and only the meaningful matters are wanted to be understood. That is the way learning occurs in society of the information overloads.

If we think about the needs of the 21st century, learning should enhance skills such as collaboration, communication, creativity and critical thinking. Being a ‘self-navigator’ is another increasingly necessary skill in the future working life. The requirement (and often desire) to be a self-navigator means that young people need to understand the nature of the social, economic and political world in which they are living and their relationships with others, locally and globally. While young people believe credentials do matter, some also understand that gaining educational credentials will not guarantee them a job (Wyn, 2009).

Youngsters who are about to enter the working life learn about it in both formal and informal ways. The most effective knowledge can come through their social surroundings outside school and can be influenced by family, friends and media. For the future, they should actively construct an education and employment profile that makes them attractive to labor markets, but many fail to make the connection with working life bot intellectually and practice.

Increasing individual responsibility for creating effective pathways through education and work heightens the relevance of identity and the task of actively constructing one's biography. For these reasons, individualistic approaches in education should also be a significant dimension of learning.

Learning itself should be in the center point of education, not the teaching. Nevertheless, surrounded by all the fancy equipment, ubiquitous technologies and digitalization, the greatest responsibility has been and will be laid on the shoulders of teachers, who should be able to guide students towards the right sources of information. Preparing the youngsters for facing the demands of work and life is a challenging duty, and as education itself has to stand
for other values beyond just preparing young people for work, it is understandable that educational transformations happen slowly.

Ancient Greek philosopher Plutarch stated: “The mind is not a vessel to be filled but a fire to be kindled.” Within an information society the teacher’s role is becoming increasingly important, as they must be the fire starters inspiring students to find their own individualistic passions and career paths, or the guiding lights leading youngsters to the right sources of information and teach them what to do with all knowledge they have access to. The importance of showing the students the meaning of values, norms, ethics, encouraging students to being the storytellers in the class, and establishing collaborating together for finding every individuals’ own strengths is not a simple duty. However, if the fire or passion in the learners’ mind could be kindled by someone or something, the results can be surprisingly rewarding.

According to the results of this research, attitudes toward using ICT for educational purposes were positive in general. That makes a good starting point for the future developments. When asking the teachers in this research if ICT can bring school and working life closer to one another, one respondent pointed out: “ICT IS future working life!”

Many schools do indeed have many innovative ways of conducting school and working life cooperation with ICT, but sharing this knowledge in collaboration between students, teachers and schools could be the next steps- I find the statement “The future is already here, it is just not evenly distributed” valid in this context. Many achievements for improving the educational usage of ICT already occur in the field of education among teachers, learners, and in teacher education. About the digitalization of education, a Finnish principal and an expert developer of education gives an insight: “The most important duty for a teacher is to create presence and common situations, where students are encouraged to think for themselves. Learning in collaboration requires from the teacher the ability and willingness to create those meaningful moments where learning occurs.” (Jordman, 2015)

Digitalization and social media provides whole new platforms for distributing the good practices for the educational usage of ICT. Educational games that are entering schools, bring a whole new possibility for kindling the minds of the learners.

In the end I would like to raise some questions for further investigations:
1. Digital skills and equality – What are the existing procedures regarding the usage of ICT in education?
2. The concept of passion in learning; Can education enable passion for learning?
3. Can education enhance the learners’ own areas of interests to correspond with the jobs of the future?
References


Saukkonen, S. (2013), Well, that’s how things really are in the world of work! The development of workplace cooperation in an upper secondary school project in Central Finland, University of Jyväskylä, Finnish Institute for Educational Research, Reports 49.


Appendices

Appendix 1. The copy of the original online survey

Tieto- ja viestintäteknologia (TVT) koulun työelämäyhteistyön rakentamisessa.

Voiko TVT tuoda koulua ja työelämää lähemmäs toisiaan?

Tämän Pro Gradu - tutkielman liittyvän kyselyn tavoitteena on selvittää opetushenkilöstön kokemuksia ja suhtautumista Tieto ja viestintäteknologian (TVT) käyttöön koulun ja työelämän yhteistyön rakentamisessa.

Kysely on suunnattu Oulun seudun yläkoulun ja lukion opetushenkilöstölle.

Taloudellinen tiedotustoimisto TAT voi hyödyntää kyselyn kautta saatua tietoa opetushenkilöstön koulutussuunnittelussa ja koulujen työelämäyhteistyön kehittämisessä.

Lisätietoja: Satu Kaattari, Oulun yliopisto, Kasvatustieteiden laitos, Education and Globalization Master Degree Programme. E-mail: satu.kaattari@tat.fi

Vastaajan perustiedot:

1. Vastaajan toimi

- Rehtori
- Aineenopettaja
- Oppilaanohjauksesta vastaava opettaja
- Ei mikään yllä olevista
2. Kouluaste, missä opetan

☐ Yläkoulu
☐ Lukio
☐ Ei kumpikaan yllä olevista

3. Vastaajan ikä

☐ 20-35
☐ 35-44
☐ 45-54
☐ 55-64
☐ yli 64

4. Vastaajan sukupuoli

☐ Mies
☐ Nainen

Koulun työelämäyhteistyö

5. Kouluun työelämäyhteistyö on mielestäni merkityksellistä, koska...

0= En osaa sanoa 1=täysin eri mieltä 2=hieman eri mieltä 3=osittain samaa mieltä 4=samaa mieltä

Oppilaat huomaavat oppiaineen yhteyden työelämään

Oppilaat saavat ajankohtaista tietoa ura- ja ammatinvalinnan tueksi

Oppilaiden työelämätaidot vahvistuvat
Oppilaiden motivaatio opiskelua kohtaan kasvaa

Oma tietämystä ammattivaihtoehtoista päivittyy

6. Joku muu syy, mikä?

________________________________________________________________
________________________________________________________________
________________________________________________________________

7. Koulussa oppilas saa tietoa työelämästä seuraavilla tavoilla:

1= ei lainkaan 2= vain vähän 3 = jonkin verran 4= paljon 5= erittäin paljon

1 2 3 4 5

Työelämän asiantuntijoiden kouluvierailujen kautta

Koululuokan tekemien työelämävierailujen kautta

Oppilaiden TET – jaksojen kautta

Työelämätietoussvideojen avulla

Oppilaiden vanhempien opastuksen kautta

Opettajien välittämän tiedon avulla

Etäyhteyden välinen tehtävien asiantuntijavierailujen kautta

Työelämästä kertovien verkkosivujen avulla

Koulun työelämätapahtumien kautta

Koulun yrityskummitoiminnan kautta

Oppilaanohjauskeskusteluissa
8. Lisäksi oppilas saa tietoa työelämästä seuraavilla tavoilla:


TVT:n käyttö koulun työelämäyhteistyössä

9. TVT-laitteiden käyttö opetuksessa yleensä

☐ on sujuva
☐ käytössä on ilmennyt pieniä ongelmia jotka olen saanut yleensä itse ratkaistua
☐ käytössä on ilmennyt ongelmia joiden ratkaiseminen on vaatinut tukihenkilön tms. apua
☐ en käyttä TVT-laitteistoa opetuksessa

10. Käytössäni on seuraavia TVT – välineitä opetuksessa

☐ Pöytätietokone
☐ Videoprojektori
☐ Kannettava tietokone
☐ Dokumenttikamera
☐ Tablettitietokone
☐ Kuulokemikrofoni
☐ Konferenssimikrofoni (ryhmäkäyttöön)
☐ Webkamera
☐ Interaktiivinen älytaulu
☐ Dataprojektori
☐ Älypuhelin
11. Onko oman työpisteesi tai luokkahuoneesi varustelu riittävää opetuskäytön vaatimusten kannalta?

________________________________________________________________
________________________________________________________________
________________________________________________________________

12. TVT - välineillä voi edesauttaa työelämätietouden lisäämistä

☐ Täysin samaa mieltä
☐ Osittain samaa mieltä
☐ En osaa sanoa
☐ Osittain eri mieltä
☐ Täysin eri mieltä

13. Perustelu edelliselle vastaukselle:

________________________________________________________________
________________________________________________________________
________________________________________________________________

14. Verkkopalvelut / sivustot, joita käytän työelämätietouden lisäämiseksi koululla:

☐ Kunkouluoppuu.fi
☐ Asiantuntijaverkosto.fi
☐ Opetin.fi
☐ Yvi-fi
☐ Yes-keskus.fi
□ Nuoriyrittäjyyys.fi
□ Yritysten omat verkkosivut

15. Muut käytämäni verkkopalvelut / sivustot, joita käytän työelämätietouden lisäämiseksi koululla:

________________________________________________________________
________________________________________________________________
________________________________________________________________

TVT – välineiden merkityksellisyys työelämäyhteistyön rakentamisessa

16. Mielestäni koulun työelämäyhteistyötä voi edistää seuraavina tavoin:

0= En osaa sanoa 1=täysin eri mieltä 2=hieman eri mieltä 3=osittain samaa mieltä 4=täysin samaa mieltä

<table>
<thead>
<tr>
<th>Työelämän vierailijat ja asiantuntijat oppitunnilla</th>
<th>0 1 2 3 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kouluuokan vierailut työpaikoilla</td>
<td>○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>TET – jakso</td>
<td>○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Työelämätietousvideoit</td>
<td>○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Lasten vanhempien opastus</td>
<td>○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Opettajien TET – jakso / vierailut koulun ulkopuolella</td>
<td>○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Rehtorivalmennukset</td>
<td>○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Asiantuntijavierailut etäyhteyden välityksellä</td>
<td>○ ○ ○ ○ ○</td>
</tr>
<tr>
<td>Työelämästä kertovat verkkosivut</td>
<td>○ ○ ○ ○ ○</td>
</tr>
</tbody>
</table>
Koulun työelämätapahtumat
Koululuokan yrityskummit
Oppilaanohjauskeskustelussa

17. Työelämäyhteistyössä on haastavaa:

0=en osaa sanoa 1=täysin eri mieltä 2= osittain eri mieltä 3=osittain samaa mieltä 4=täysin samaa mieltä

Ammattivaihtoehtojen laaja kirjo
Työelämän nopeasti muuttuvat osaamistarpeet
Ajantasaisen tiedon saaminen työelämästä
Työelämästä kertovien asiantuntijoiden puute
Resurssipula työelämävierailujen järjestämisessä
Työelämän ilmiöiden esille tuominen omassa opetuksessani

Koulutustarpeet

18. Minulle sopivia TVT- koulutuksen / tiedotuksen muotoja:

☐ Sovelluskoulutus ATK-luokassa
☐ Työpajatyöskentely, jossa mahdollisuus omien materiaalien muokkaamiseen
☐ Verkossa olevat käyttöohjeet
☐ Henkilökohtainen konsultaatio ja ohjaus
☐ Vertaisohjaus arjessa
☐ Säännöllisesti kokoontuva avoin yhteisö, tapaamisissa lyhyitä tietoiskuja tai teemoja
☐ Seminaarat
Verkkosivusto, josta voisi seurata ajankohtaisia TVT-asioita
Erityisesti verkko-opetukseen ja TVT-koulutukseen kohdennettu sähköpostilista

19. Kehitysideoita TVT-koulutuksen ja tiedotuksen järjestämiseen:

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

20. Haluaisin seuraavista sovelluksista koulutusta tai tukimateriaalia:

☐ Verkko-oppimisympäristöt
☐ Sosiaalinen media (mm. Wiki, Blogi, Facebook, Instagram, Twitter)
☐ Etäyhteysohjelmat (mm. AdobeConnect, Skype, Lync)
☐ Office – ohjelmat (mm. Word, PowerPoint, Excel )
☐ Sähköpostin käyttö
☐ Verkkosivujen tekeminen
☐ Tablettitietokoneet opetuksessa

21. Edellisten lisäksi toivoisin koulutusta tai tukimateriaalia seuraavista sovelluksista:

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

Kiitos vastauksestasi!
Appendix 2. The English translation of the survey

Building school and working life cooperation by using ICT. Can ICT bring school and working life closer to one another?

1. Position of the respondent

Principal
Subject teacher
Student counselor
None of the above

2. The school level I am teaching

Junior high school
General upper secondary school
Neither of above

3. Respondent’s age

20-35
35-44
45-54
55-64
over 64

4. Respondent’s gender

Male /Female

Working life cooperation in school
5. I think school and working life cooperation is important, because... scale 0-4

0= I don’t know
1= I disagree agree completely
2= I disagree slightly
3= I agree slightly
4= I agree completely

The connection between school subjects to working life is becoming visible to the students
Students get up-to-date information about working life for supporting their career planning
The working life skills will become stronger
The motivation for studying will improve
My own knowledge about the choices in professions is updated

6. Some other reason, describe what?

- open-ended answer

7. In school a student gets information about working life by … (scale 1-5):
1= not at all  
2= very little  
3= some  
4= a lot  
5 = very much

By using working life visitors in schools  
By making study visits to different working life places  
Through students’ working life practice sessions  
By watching videos about working life  
Students gets working life information from their parents  
Students gets working life information from their teachers  
Using online experts visitors in the class  
By using working life information websites  
From working life events occurring at school  
By doing company cooperation  
With student counselor discussions  
8. In addition students get information about working life: (open answer)

Usage of ICT in school and working life cooperation

9. Using ICT in teaching is (choose one option)

fairly easy  
is challenging, but I’ve solved problems myself  
has been difficult, I’ve needed aid from ICT support  
I don’t use ICT in my teaching

10. I have the following ICT equipment that I can use in my teaching

Desktop computer  
Video projector  
Laptop computer  
Document camera  
Tablet computer  
Headset with microphone  
Conference microphone  
Web camera  
Interactive whiteboard  
Data projector  
Smartphone

11. Is your own workplace equipment satisfactory for responding to the demands of teaching?

- Open-ended question

12. ICT can support school and working life cooperation.
I agree completely
I agree partially
I don’t know
I disagree partially
I disagree completely

13. If possible, please give more details about your answer to the question above
- open-ended question

14. Online services / websites I am using for increasing the information about working life at school:

Kunkoululoppuu.fi (When School Ends)
Asiantuntijaverkosto.fi (Network of Experts)
Opetin.fi (The website for schools and companies to meet)
Yvi-fi (Entrepreneurship education to schools and teacher training)
Yes-keskus.fi (The service promoting entrepreneurship at schools)
Nuoriyrittajyys.fi (Young entrepreneurship website)
Yritysten omat verkkosivut (Websites of the companies)

15. Other web-based services / websites I am using for increasing the knowledge about working life at school
- open-ended question

16. In my opinion school and working life cooperation can be promoted by (scale 0-4)

0= I don’t know
1= I disagree completely
2= I disagree slightly
3= I agree slightly
4= I agree completely

Working life visitors and experts in class
Student group study visits in workplaces
Work practice sessions
Informational videos about working life
Parental guidance
Teacher work practice sessions / visits outside school
Career information training days for principals
Expert online visits in class
Websites presenting careers
Working life events at school
Entrepreneur cooperation with school class
Through student counseling discussions

17. In school and working life cooperation I find challenging (scale 0-4):
0 = I don’t know
1 = I disagree completely
2= I disagree slightly
3= I agree slightly
4= I agree completely

Large amount of choices in careers
Rapidly changing needs of working life
Up-to-date information about working life
The lack of experts who can bring knowledge about working life
Lack of resources for organizing the study visits
Brining the working life phenomenon into my own teaching

18. The most suitable ways of ICT training for me:

Application training in classroom
Workshops with a possibility to modify my own teaching materials
Website information instructions
Personal consultation and guidance
Peer counseling in everyday work
Regular gatherings where brief information sessions or themes are being presented
Seminars
Website from where current ICT matters can be followed
E-mail list focusing on web-based teaching and ICT training

19. Suggestions for developing ICT training for teachers

- open-ended question

20. I would like to get training or supporting material about the following applications:

Web – based learning environments
Social media (e.g. Wiki, Blogs, Facebook, Instagram, Twitter)
Remote access programs (e.g. AdobeConnect, Skype, Lync)
Microsoft Office – programs (e.g. Word, PowerPoint, Excel)
Using e-mail
Producing websites
Tablet computers in teaching

21. In addition I would hope to get training or supportive educational material about the following softwares:

- open-ended question
Appendix 3. The research permission from the Education and Cultural Services

<table>
<thead>
<tr>
<th>Hakijan henkilötiedot</th>
<th>Tutkimuslupahakemus</th>
<th>OULU</th>
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<tbody>
<tr>
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<td>Etunimet</td>
<td>Henkilötunnus</td>
</tr>
<tr>
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<td>Satu</td>
<td>120974</td>
</tr>
<tr>
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<td>Postinumero</td>
<td>Postitunnapaikka</td>
</tr>
<tr>
<td>Kolantie 34</td>
<td>90140</td>
<td>Oulu</td>
</tr>
<tr>
<td>Sähköpostiosoite</td>
<td><a href="mailto:Satu.kaatari@tat.fi">Satu.kaatari@tat.fi</a></td>
<td>Puhelin 0405143874</td>
</tr>
</tbody>
</table>

### Tiedot tutkimuksesta

**Tutkimost, johon tutkimus sisältyy**

- Education and Globalization master degree programme, Kasvatustieteet maisteri
- Tutkimuksen ohjaajana on Johanna: PhD, Development manager

**Tutkimuksen aikataulu**

- Syyskuu 2014
- Kasvatustieteen laitos, Oulun Yliopisto, Mukana Taloudellinen tiedotustyöntoimisto TAT

**Luutanto**

- Tämän Pro Gradu - tutkintamaan liittyvän kyselyn tavoitteena on selvittää opetushenkilöstön kokemuksia ja suhtautumista Tieto ja viestintäteknologiassa (TVT) käytöön koulun ja yliopiston yhteistyön rakentamisessa.

**Tutkimuksen ohjaajan tiedot**

- Miten tutkimuksessa otetaan huomioon tutkimukseen liittyvät eettiset kysymykset?
- Tiedonhankinta-prosessissa aineisto kerätään webpropolis - ohjelmalla toteutettavalla kyselyllä, jolloin vastaajat voivat anonymisoida kirjoittamaan ja heidän henkilöllisyyteensä ei tule tutkijan tietoon.

**Sähköpostiosoite**

- Johanna.bluemink@oulu.fi, Puhelin: 050 3709505

**Allekirjoitus**

- Oulu, 25.3.2014

### Liitteet

**Liitteet**

- Tiedote tutkittavaan yksikköön yksikköyn kutsukirje tutkittaville
- Tutkimussuunnitelma (myös vapaaehtoinen)

**Palautus**

- Jos tutkimus kohdistuu yhteen yksikköön (päiväkoti, peruskoulu, lukio), tutkimuslupa liitteineen toimitetaan allekirjoitettuna sähköisesti yksikön johtajalle (päiväkodin johtaja, rehtori jne.). Sähköposti yleensä muotoa etunimi.sukunimi@oulu.fi

- Muutto tutkimuksia koskevat tutkimuslupa liitteineen toimitetaan allekirjoitettuna sähköisesti liitteeseen sähköpostiin sähköpostiosoite.
Appendix 1 to research application

Introduction

According to the Economic Information Office (TAT) researches majority of Finnish high school students would hope to have more information about the working life during their studies. (Nuoret ja työelämä, TAT 2012) The subjects learned at school may not have clear connection to the future professions, and the lack of knowledge about the opportunities that exist in the constantly changing working life makes career planning problematic for young people.

The changes in working life caused by globalization and information technologies require reshaping our education, and the needs of working life has become very unpredictable.

Manuel Castell stated (2000) “We have entered a new technological paradigm and new form of organizational structure having shifted from vertical to more flexible and adaptable networking forms of activity in economy, society, politics and culture. Historical problems of networks are overcome by the new network technologies.”

In the future working life requires more flexible, collaborative, socially oriented self-navigators, who are connected around the world using network technologies.

Students should be equipped with the knowledge and skills required for further studies and working life. It is forecast that with the future changes society, working life will alter considerably, which in turn will bring new challenges for education. Developments in information technology, in particular, are expected to overhaul the occupational structure and competencies required in society over the next two decades. (Reports of the Ministry of Education and Culture, Finland)

We may have the needed technologies for bringing the schools and working life closer to one another, but the challenge is that the pedagogical thinking in educational institutions has not advanced in parallel with technological advances. (Sipilä 2013) The Survey of Schools – ICT in Education comparison between European countries indicated that usage of ICT in the education is relatively low also in Finland, where the teachers are still using ICT mainly to support traditional pedagogical practices. (Survey of Schools 2012).

This survey is asking from the high school teachers how do they feel about using ICT in promoting the working life and school co-operation. Main question is to find out, can ICT tools really bring the working life and education closer to one another.

Keywords: Information and Communication technologies, Education, Information technology, Teacher education, Student counselors, Future skills, school and working life cooperation
LIITE 2

TIĘDOTE TUTKITTAVAAN YKSIKÖÖN

Tutkimusaihe: Tieto- ja viestintäteknologia (TVT) koulun työelämäyhteistyön rakentamisessa. Voiko TVT tuoda kouluja ja työelämää lähemmäs toisiaan?

Tämän Pro Gradu - tutkielmaani liittyvän kyselyn tavoitteena on selvittää opetushenkilöstön kokemuksia ja suhtautumista Tieto ja viestintäteknologian (TVT) käyttöön koulun ja työelämän yhteistyön rakentamisessa.

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Taloudellinen tiedotustoimisto TAT voi hyödyntää kyselyn kautta saatua tietoa opetushenkilöstön koulutussuunnittelussa ja koulujen työelämäyhteistyön kehittämisessä.

Lisätietoja: Satu Kaattari, Oulun yliopisto, Kasvatustieteiden laitos, Education and Globalization Master Degree Programme. E-mail: satu.kaattari@tat.fi