

MASTEROPPGAVE

“Does ICT in English instruction improve students’ learning attainment?”

-A survey of Norwegian teachers’ attitudes”

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Abstract

Technology is becoming more integrated in society with every new app invented. Schools are greatly investing in devices for their students and staff, and there seems to be a highly positive attitude towards technology among teachers of English as a second language (ESL) in Norwegian schools. However, recent publications claim that learning mainly via information and communication technology (ICT) may have negative effects on learning attainment.

This study seeks out new information in an effort to map Norwegian English teachers' attitudes towards technology in the ESL classroom. Their attitudes are correlated with aspects such as their age, teaching level and education. Further, the answers from teachers in two Norwegian municipalities with a special focus on ICT are compared to answers from a cross section of Norwegian teachers, in order to map teachers' attitudes towards how students' learning attainment is affected by technical aids. 325 teachers completed a survey on their practices and attitudes concerning ICT in their teaching of English. The result of the study showed that: (1) there were noteworthy positive attitudes in teachers' outlook toward technology compared to traditional teaching methods. (2) There was statistically significant correlation between teachers' age and ICT use and age and their perceived effect of ICT use. The number of teachers in the selected municipalities who mainly use ICT in their teaching, incrementally declines with age, yet the perceived high effect of ICT increases within the same age group. This may be interpreted as when there is less ICT use, the teachers in this survey see a higher effect of ICT.

Keywords: English second language teaching, ICT, attitude, age, experience, teaching level, learning attainment.

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1. Introduction

In the past decades, there have been tremendous developments on digital platforms made for teaching English language. Digital devices, apps, and learning platforms are made available to teachers and students in a rapid tempo. However, despite the vast digital improvements, research has not been able to provide conclusive effects of information and communication technology (ICT¹) on student accomplishment (Balanskat et al., 2006; Harrison et al., 2002; in Voogt and Knezek 2008, 84). In addition, constant technological progress has made most of the early findings outdated and largely irrelevant to today's research. Moreover, technology-specific studies carried out in the past did not explore central issues regarding technology and teaching (Zhao et al., 2002, 483).

In Norway, many municipalities focus on the implementation of digital devices in schools. According to Wikan and Mølster, there are two main arguments for the substantial investment in ICT in the Norwegian educational system. One is that “schools have to follow the technological development so that the students are prepared for a society where the use of digital tools is a natural part of life” (2009, 1). This is generally accepted, as technological “know-how” has become a prerequisite for navigating one's way in today's society. Wikan and Mølster's second argument is the presumed learning-enhancing result of ICT use in schools. This argument “[...] is based on an assumption that the systematic and professional use of ICT will enhance academic learning” (2009, 1). However, as they point out, this argument is debatable since despite every attempt at research of the topic over the years, there is no clear scientific evidence to support this assumption (Wikan and Mølster 2009, 1). Nonetheless, political forces still push for ICT in schools, despite the lack of systematic data of its superiority over traditional teaching methods². As it is challenging to measure exactly how applying ICT to language teaching affects students' learning attainment³, another vantage point needs to be explored, to ensure that all the time and resources spent on a digital

¹ By “ICT” (information and communication technology) for the purposes of this thesis, is defined as a diverse set of technological tools and resources used to communicate, and to create, spread, store, and manage information. The devices may be a Chrome book, an iPad or a personal computer.

² By traditional teaching, it is for the purpose of this thesis meant, writing/ drawing with pen on paper, using the textbooks and workbooks, notebooks, and reading without the use of a screen.

³ The term “learning attainment” is, explained as descriptions of what the learner is expected to know, understand, and or do by the end of a learning process. However, it is also the starting point for planning lessons, teaching and assessment. Learning attainment offers a working method to ensure transparency context and structure in planning, teaching and assessment (Prøitz, 2018, 14).

approach is not in vain and more importantly, that students acquire the required knowledge. Hatlevik and Arnseth state that further research aimed at teachers to identify their attitudes towards ICT in teaching is highly important (2012, 1). Teachers' outlook and concerns have a significant influence on the use of computers in the classroom (Atkins and Vasu 2000, 281; Zhao et al., 2002, 495). Also, the success of ICT is dependent on the teachers' motivation to utilize digital aids in language instruction (Seraji et al., 2017, 177). Without the proper research into the effects of vast ICT implementation, it may be perilous for teachers to distance their teaching from the more traditional teaching methods such as textbooks and pen on paper- writing in order to keep up with the digital advancements.

In the influential article, *Only Three Fingers Write, but the Whole Brain Works: A High-Density EEG Study Showing Advantages of Drawing Over Typing for Learning* (2018), van der Meer and van der Weel convincingly argue that memorizing is augmented when writing on paper. This recent study provides details of the fact that more areas of the brain, associated with learning, are activated when using the pen on paper method in comparison to writing on a computer keyboard (2018, 1).

In 2018 I conducted a pilot study involving 44 English second language (ESL) students in seventh grade in a Norwegian municipality. In this study, students were divided into three groups where two groups took a series of grammar tests digitally and the third group took the same tests by writing with pen on paper. It turned out that, when asked what kind of testing the students preferred, and believed resulted in the highest learning attainment, all students answered in favour of digital testing. The Norwegian institute for research and education's (NIFU) study conducted by Tømte et al., similarly discovered that students are highly positive towards ICT (Tømte et al., 2018, 61). However, the test results showed that the students scored considerably higher when using the pen on paper method. It became clear that the students' motivation for working with a digital learning platform did not make up for the fact that the pen on paper testing resulted in greater achievements. Moreover, students self-assess on a large scale that their work improves due to ICT (Tømte et al., 2018, 61). The fact that students in my research claimed to learn more using ICT while tests, on the contrary, show diminished learning attainment is why it is essential to explore the attitudes of teachers. Teachers are in possession of a unique understanding of their students' development and learning attainment. Next, the aim of this thesis follows.

1.1 Aim

Teachers hold experiences from their daily lives as educators parallel to none. On a daily basis teachers monitor successful and non-successful methods of teaching. With the recent study mentioned above in mind, it is crucial to look into the teachers' attitudes when it comes to the instruction of ESL. The aim of this thesis is to map teachers' attitudes towards ICT in the ESL classroom. The research questions for this thesis are:

1. *What are the attitudes of English teachers in two Norwegian municipalities with a special focus on ICT towards digital teaching methods, versus more traditional methods?*
2. *To what extent does the teaching practice of English teachers in the selected municipalities include digital approaches, and to what extent do they find such approaches to be effective?*
3. *How do teachers' attitudes in the selected municipalities compare to teachers' attitudes in other municipalities in Norway, with regard to age, education level and teaching level?*

1.2 Overview of study

The thesis contains six chapters. The introduction and background explain the necessity of an investigation of the issue of ICT in ESL instruction. Next, the aim for the thesis is accounted for. Then follows the theoretical framework, and then, the method and research design are described, followed by the result chapter. After this is the discussion of findings in light of previous research. The thesis ends with a sum-up and a short conclusion.

2. Theoretical framework

This chapter includes a brief overview of earlier research on the effect of ICT in language teaching. The literary review also includes previous studies on teachers' attitudes towards ICT, Prensky's theory on students' innate need for ICT (2001), and finally, illuminating research on how pen on paper versus keyboard writing affect language learning.

2.1 How does technology affect learning attainment

Technology undoubtedly changes fast, resulting in the prospect of continual new technological aids that arrive with massive potential for impact on students' learning attainment. According to Gilje 2019⁴, it is during the past decade that the most significant developments of technological aids in schools have taken place. However, little is known about the effects on learning attainment.

Much of the research conducted on the effect of ICT took place some time ago. In 2002 there was a significant British study called the "ImpaCT2" report (Harrison et al., 2002). This report was based on investigations of 60 different schools. "ImpaCT2" shows that ICT leads to statistically significant enhancement in some subjects (Scheuermann and Pedró 2009, 14). English language learning was one of the subjects that produced higher scores with ICT (Harrison et al., 2002, 3). However, the fact that this study was conducted a while back should be noted, as use of technological equipment in 2002 demanded additional facilities such as computer rooms. Using a computer room required additional planning. Relocating an entire class to another location, starting up the computers was time consuming at this stage and estimating enough time to end the session promptly, stole from the actual ICT usage. Obviously not all students were able to use computers at the same time as schools rarely had more than one computer room. Because of the limitations regarding computer access, the use of ICT during the survey period was reported to be relatively low (Harrison et al., 2002, 2-3). Moreover, the "ImpaCT2" survey in the English subject was conducted on English native

⁴ Øystein Gilje, Teacher Convention in Oslo 02.01.2019.

speaking students. Their level of achievement may, of course, be the result of their prior knowledge of their native tongue.

According to the OECD's programme for International Student Assessment over the past ten years: activities, such as using drilling and practice software for language learning, show a clear negative correlation with performance (OECD 2015, 190). The report additionally states that technology sometimes distracts from valuable human interaction needed to learn a language (OECD 2015, 3). This means that too much ICT work may reduce the time students practice the target language orally with each other.

Norway has, according to the 2010 Pisa study, the highest ICT use among students in all of the OECD nations⁵, and the best ICT infrastructure at school level. However, Norwegian students have had the largest relative decline in skills and knowledge from 2003 to 2009⁶ among all the students in the OECD (OECD 2010, 134). Tømte et al., have conducted a survey that maps students' own perceived learning attainment due to ICT. The report concluded that when it came to writing, many students find it motivating to use ICT and claim they learn from the practice (2018, 66). As mentioned, the self-assessment of students does not always correspond with the actual learning attainment.

To sum up, research shows various results regarding learning attainment due to ICT use in ESL instruction. It also shows that a large portion of the data is outdated and that the ICT development in the last decade is so extensive that research has not been able to keep up with the new possibilities for teaching via digital aids. Next, research on teachers' attitudes towards ICT will be accounted for.

2.2 Teachers' attitudes towards ICT

In this sub-chapter, research focused on the attitudes of teachers will be presented. Hatlevik and Arnseth stress the need and importance for further research to identify teachers' attitudes towards ICT (2012, 1). This thesis aims at mapping exactly such attitudes. According to Mueller et al. previous research advocates the necessity for teachers to have positive experiences with technology specifically developed for the subject they teach, in order to make use of ICT as a tool (Mueller et al., 2008, 1534). Correspondingly, Zhao et al.

⁵ OECD is the Organization for Economic Cooperation and Development with 36 member countries. Founded in 1961.

⁶ Lars Vavik, Conference Presentation at "FOU i praksis", Trondheim, 10.05.2010.

state that if the teacher has a didactic, rather than a techno-centric understanding of the role of technology, this may produce better results. Zhao et al. argue that technology should be seen as a means for reaching a specific objective for a subject, rather than as an incorporation of technology as an end in itself (Zhao et al., 2002, 489). Therefore, the expansion of ICT cannot just focus on technological applications; there is also a need to connect with a particular curriculum and subject area and with specific attention to the pedagogical practices associated with the subject. The effectiveness of technical incorporation is further embedded in pedagogical and design values rather than in technology itself (Li and Ni 2011, 73). Moreover, as Mueller et al. state, “[...] a teacher’s positive personal or vicarious experiences with computer technology will lead to greater integration” (Mueller et al., 2008, 1526). Seraji et al.’s qualitative study, involving an analysis of teachers’ attitudes concerning technology in classrooms, has findings that concur with Mueller et al.’s, stating that teachers’ positive attitudes toward the integration of ICT help increase students’ learning attainment (Seraji et al., 2017, 177).

A study by Sağlam and Sert positions that teachers without ICT- specific educational background still hold that technology contributes to foreign language progress. They claim that ICT can facilitate “a hands-on, interactive and cooperative learning experience, linking learning to real life academic skills, fostering motivation and providing instant access to information” (2012,12). However, not all are positive towards ICT. Strong voices in the Norwegian educational system such as Haugsbakk, state that the view of technology is dominated by the industrial community’s understanding of technology, by politicians in particular (2011, web). Technology is perceived as an independent field and as an aid to make teaching more efficient and ease every day challenges. Further, Haugsbakk argues that ICT is often portrayed as a means of dealing with increasing complexity, when ICT in fact contributes to new complexity. Haugsbakk finds it problematic that this new complexity is not taken into consideration. He claims that the focus on teacher pedagogies is at the expense of the students and the students’ learning process (2011, web). According to the International Computer and Information Literacy Study’s (ICILS), in which 138 Norwegian schools participated, the proportion of Norwegian teachers who frequently use various digital tools in instruction is significantly lower than the international average (Ottestad et al., 2013, 31). This is in stark contrast to the OECD’s findings from 2010 where Norwegian students were reported to have the highest ICT use among students in all of the OECD nations (OECD 2010, 134). In addition, the large-scale survey “ARK & APP” from 2015, shows that teachers in primary

school prefer paper-based teaching aids, and see digital learning aids as mere supplements. Gilje et al. state that there are relatively large variances when it comes to the use of digital and paper-based teaching aids in primary and secondary schools (Gilje et al., 2016, 24). More than 60 percent of teachers state that they largely use paper-based teaching aids in primary school, although they balance their teaching with digital aids. In upper secondary school, less than half of the teachers state that they mainly use paper-based teaching aids in their English classes. The use of digital learning materials in upper secondary is extensive in the English subject (Gilje et al., 2016, 71). Digital learning resources such as games and virtual reality, create motivation in the student group. However, the motivation students might experience is merely transferred into learning attainment if the ICT allows students to work with material directly related to the subject (Gilje et al., 2016, 73).

Tømte et al. state that teachers are overall largely positive towards using ICT in school projects (Tømte et al., 2018, 29, 39). However, teachers miss a clarification of how to use digital aids. It is not clear how ICT can contribute to pedagogical improvement in the classroom (Tømte et al., 2018, 72). The ICT- positive teacher holds an important role. However, Karavanidou et al. have another take on the eagerness of teachers concerning ICT usage. They state that the degree of teacher enthusiasm toward technological innovations in teaching is a factor that reduces the trustworthiness of ICT (Karavanidou 2017, 157-158), meaning that the perceived possibilities of ICT, potentials of learning attainment and the sheer novelty of technology may entice teachers in a direction that is in fact unfortunate for students' learning attainment. In other words, there may be an over usage of ICT considering the lack of scientific evidence of improved learning attainment.

A number of researchers agree on the importance of pen on paper writing and the perils of facing it out due to extensive keyboard use. By choosing a method of work that eliminates the pen to paper method, we start to change our brains in fundamental and unknown ways (Kress, 2003; Mangen and Balsvik, 2016; Vygotsky, 1962; Chandler, 1995; Karavanidou 2017, 158). Teachers and academics may strive to safeguard handwriting, but students will still change over time, familiar as they are with digital devices. It might be that students' methods of attaining knowledge has changed to the point that teachers need to change their teaching practices. In the following part the research of Prensky is presented. Prensky (2001) claims that students need a new approach for attaining knowledge due to their developed technological understanding.

2.3 Digital natives

Prensky argues for teachers to adjust their teaching to incorporate as much ICT as possible. He claims that the “digital native” students have grown up with ICT naturally incorporated into their daily lives, so to remove ICT from school would be unnatural and demotivating to the students (2001, 4). He believes there is a new generation with a highly different set of cognitive skills than those before them. Digital natives are “accustomed to the twitch-speed, multitasking, random-access, graphics-first, active, connected, fun, fantasy, quick-payoff world of their video games, MTV, and Internet are bored by most of today’s education [...]” (2001, 4). Prensky calls for new approaches to teaching due to the cognitive differences in the digital native student’s brain. He argues how minds that undergo various developmental experiences evolve differently. More technologies are being developed that cater to game based and enjoyable learning that can also provide swift feedback and developmental assessments, consequently causing more personalised learning (OPCD 2015, 191). Prensky wants teachers to facilitate for ICT in their instruction, and the future of teaching is also leaning towards such methods. “Teachers who use inquiry-based, project-based, problem-based or co-operative pedagogies often find a valuable partner in new technologies” (Johnson et al., 2014, in OPCD 2015, 191). Project based methods of working are also consistent with the renewal of the English curriculum which takes place in Norway in 2020 (UDIR 2019, web). The renewal focuses on the student being the inquisitive party, and technological tools will undoubtedly be essential in student project based research. Moreover, it is in concurrence with Prensky’s ideas as it caters to the digital native students’ way of learning. In what follows the issue of pen on paper writing versus writing on a keyboard will be presented.

2.4 Pen on paper writing versus the keyboard

Pen on paper writing is a friction creating exercise executed by hand. It is an individual coordination of movement and visual perception that involves recalling spelling from memory, and translating these thoughts through a separate drawn line, as the pen moves on the paper (Berninger et al., 2009a; Dinehart, 2014; Longcamp et al., 2003, 2011; Dinehart and Manfra, 2016; Mangen and Balsvik, 2016; Karavanidou et al., 2017, 155-156). In recent years there have been studies that might challenge Prensky’s claim that students of the digital era need to learn in a digitally enhanced way. Wollscheid et al. point to results of earlier

published studies that are in favour of traditional learning, pen on paper writing, specifically (Berninger et al., 2009; Connelly et al., 2007; Longcamp et al., 2005; Wollscheid 2016, 30).

According to Karavanidou, the interdisciplinary research on writing modalities, a field that has attracted a large group of experts with various opinions on the issue for over 36 years, shows inconsistent results, interestingly enough, most overwhelmingly in favour of pen on paper writing (Karavanidou 2017, 154). Research shows cognitive benefits from pen on paper writing repetition. For instance, the quality of written texts improves because students achieve better self-regulation from pen on paper lettering. Students' working memory is activated to a higher degree; their thoughts are better documented by handwriting (Bara and Gentaz, 2011; Berninger et al., 2009a, 2009b; Connelly et al., 2007; Cunningham and Stanovich, 1990; Longcamp et al., 2005; Smoker et al., 2009; Velay and Longcamp, 2010; Karavanidou 2017, 154).

More experimental studies combining qualitative and quantitative methods, in particular show a positive impact on digital tools on students' writing (Wollscheid 2016, 30), meaning that when students are interviewed on the matter of motivation for ICT work, the outcome is positive. Students self-assess high perceived learning attainment, and claim positive results from writing using technological aids in their school work. However, van der Meer and van der Weel's research from 2018 shows results that contradict the students' self-assessment. They used note taking digitally versus sketching and describing with pen on paper as a basis for comparison. In their study, "[...] electroencephalogram (EEG) was used in young adults to study brain electrical activity as they were typing or describing in words visually presented Pictionary" (2018, 1). The tests showed that when typing words on a keyboard brain activity in the central and frontal brain regions was observed. When writing with pen on paper, van der Meer and van der Weel found that brain areas in the parietal and occipital regions showed activity. Existing literature suggests that the latter activity provides the brain with optimal conditions for learning (van der Meer and van der Weel 2018, 1). This means that the brain activates areas connected to learning when using the complex movements of the hand during note taking with pen on paper. Both activities, writing on key board or using a pen include a similar idea phase. Yet when it is time to execute the writing routine, the ways the mind works differ when typing on a keyboard as opposed to writing with a pen (Van der Meer and van der Weel 2018, 7). Van der Meer and van der Weel are not the only scientists to arrive at this result.

The results of Mueller and Oppenheimer's tests on students, comparing the knowledge attained from handwritten notes versus keyboard notes, correspond to van der Meer and van der Weel's research. Mueller and Oppenheimer conducted tests where they showed thirty minutes long TED talk⁷- videos on uncommon subjects to a group of students. Some of the students took notes on paper, while others wrote on a computer keyboard. The result of this study showed that students who wrote with pen on paper could answer questions to a larger degree when quizzed on rare topics, than the ones who wrote using keyboards (Mueller and Oppenheimer 2014, 1159 -1161). This shows that there is a difference in memory when using the two methods of note taking, despite the fact that the test is conducted on, what Prensky refers to as "digital natives", students whose cognitive skills are altered to the point where in order to learn, technological means are required.

Other research also shows the importance of handwriting for cognitive development such as Karavanidou et al. "Handwriting connects the visual with the writing surface and the premotor cortex in the brain with Broca's expressive speech area, Exner's graphomotor area and Wernicke's processing of spoken words area [...]" (Karavanidou et al., 2017, 155-156). Moreover, Fortunati and Vincent explain that writing with a pen is much less hurried and endorses the formulation of a sentence. A handwritten phrase is usually already fully formed in the writer's mind because of the difficulty of subsequent corrections (Fortunati and Vincent 2014, 45). Working with text on a keyboard, however, is a standardized and repetitive activity in which the mind creates a chart of each letter's placement on the keyboard in order to write (Longcamp et al., 2008, 802). Next, the method and research design for the survey to find out about the teachers attitudes is presented.

⁷ TED is a non-profit organisation devoted to spreading ideas, usually in the form of short, powerful talks (18 minutes or less). TED began in 1984 as a conference where Technology, Entertainment and Design converged, and today covers almost all topics — from science to business to global issues.

3. Method and research design

In this chapter, the research design is explained with a description of the method used. A brief account of the implementation and distribution follows, together with a look at the pool of respondents. All results of the survey are presented in chapter 4. The theoretical foundation for this thesis is eclectic and not limited to any particular theoretical perspective within the emerging and dynamic field of ICT in education.

3.1 Implementation

For this research project, a quantitative method for data collecting was applied. This means an investigation that analyses a number of units, in this case teachers' attitudes towards the use of ICT in English teaching. The data was collected via a survey. Surveys such as this are fitting when asking questions about attitudes. Surveys are also applied when evaluating multiple variables or testing multiple hypotheses (Neuman 2006, 316). For this thesis, two municipalities with a focus on ICT implementation in all teaching have been chosen to participate in the survey. These anonymous municipalities will hereby be referred to as municipalities *C* and *D*. In both municipalities, all students and teachers have been equipped with technical devices such as a Chrome Book, a personal computer or an iPad. Students in these municipalities use individual devices every day and can bring them home with them for homework. With a technical device available all the time, students use ICT for more schoolwork now than ever before. Consequently, the methods with which teachers teach and students learn are under rapid development. This makes reflection concerning students' learning attainment, and teachers' attitudes to implementation of ICT, imperative. The attitudes of the teachers, gathered through a survey, in two selected municipalities were compared to a cross section of teachers from various other Norwegian municipalities.

The survey consists of 17 items (See [Appendix 1](#)). It has three parts; the first part consists of demographic questions, the second part includes statements about teachers' attitudes toward technology. Finally the third part includes statements about teachers' attitudes towards students' learning attainment using ICT. The survey consists of a digital self-report questionnaire distributed to English teachers in all schools in the C and D - municipalities, via a platform called, Survey XACT, a professional digital service made for

questionnaire- based surveys for educational institutions, designed by Ramboll. The questions were constructed to give a basis for comparison of how teachers of different ages, educations, and teaching levels prefer ICT use in teaching versus traditional teaching aids. The survey was also constructed to measure how teachers in ICT dense schools experience the effect of ICT versus traditional teaching aids on their students. The questionnaire consists of Likert-type questions, which calls for ratings on a five-point scale. The scale ranges from “I totally disagree” to “I totally agree”. The last two questions present an opportunity for the teachers to give accounts of what they believe “traditional teaching” and “teaching via ICT” entail. When the results from the survey were being uploaded into an excel file to accommodate the program applied in order to process the number and create graphical images of the results, a choice was made not to display the charts with decimal numbers. As a consequence some of the columns in the charts may display results of 99% and some 101%. The significance when comparing results from the survey was calculated using the available program from StatPac. The purpose of this quantitative analysis is to investigate the research questions:

- 1. What are the attitudes of English teachers in two Norwegian municipalities with a special focus on ICT towards digital teaching methods, versus more traditional methods?*
- 2. To what extent does the teaching practice of English teachers in the selected municipalities include digital approaches, and to what extent do they find such approaches to be effective?*
- 3. How do teachers’ attitudes in the selected municipalities compare to teachers’ attitudes in other municipalities in Norway, with regard to age, education level and teaching level?*

3.2 Distribution

There are 36 elementary schools in the 2 selected municipalities combined, 23 lower secondary schools, and 12 upper secondary schools. All schools received invitations to participate in answering the survey via email. In the first round of distribution, emails were sent out to all principals and department managers of the schools, so they could redistribute the survey to the members of staff who teach the English subject. In some cases, the upper secondary schools had detailed address lists with information regarding what subject each member of staff was teaching, an email was sent directly to English teachers only. Although, specific job detailed address lists such as this were not frequent. A week later, a new round of emails was deployed, urging anyone that had not participated to do so. However, this method of distribution resulted in a disappointingly low number of respondents. Therefore, the next step was to send individual e-mails to all teaching staff in the cases where specified address lists were unavailable. In order to compare the two municipalities to a cross section of Norwegian teachers, an appeal to the Facebook group “Engelsklærere” was made, urging these teachers to answer the survey and sharing the link on the web site.

3.3 The participants

The total number of respondents from the two selected municipalities is 187. The response percentage was 62. 279 enquiries were distributed in total. The number of respondents from the control group is 138, the response percentage was 53. 233 enquiries were distributed in the control group, in total. This adds up to 325 respondents to the survey in total and a response percentage high enough to deem the survey valid. The charts below show an overview of the respondents from C and D and the control group. They give an overview of the respondent attitudes towards the importance of ICT and traditional teaching. In the two columns to the right the results from the control group are split into teachers with students who have their own digital device and teachers with students without their own digital device. The numbers are given in percentages. On the lower line the numbers of respondents can be seen. The x-axes show the total of respondents in the various age groups. The y- axes show the percentage.

Figure 1. ICT is important to learning English.

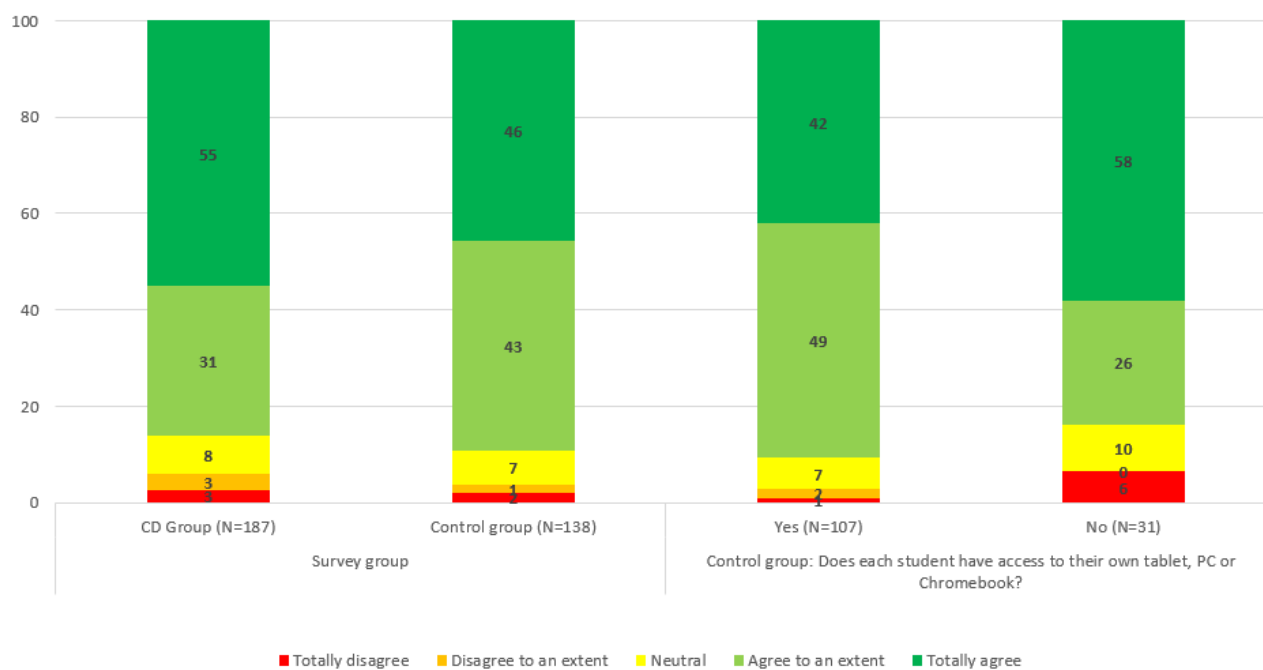
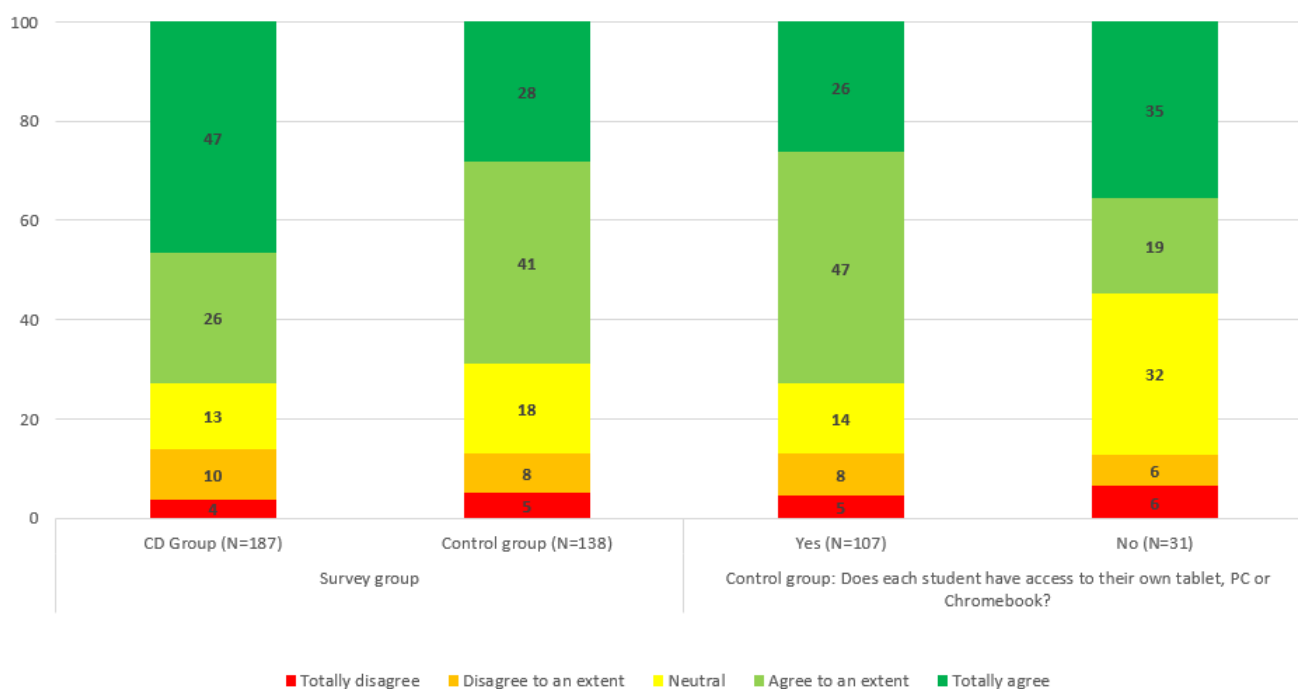


Figure 2. Pen and paper assignments are important to learn English



As made clear by the graphical charts the attitude that ICT is important does not mean that the teachers find traditional approaches less important as seen in figure 2.

3.4 Calculating statistical analysis

To make sure the results from the respondent groups are correctly compared it is important to use the proper statistical tools and techniques. In the discussion chapter the graphical charts will be compared, interpreted and explained by using the term statistical significance. The term statistical significance is defined as follows: “statistical significance is the likelihood that a relationship between two variables is caused by something other than chance” (Investopedia 2019). Statistical significance is calculated using a p-level, which tells the likelihood of the result being observed, given that a certain hypothesis is true (Ruff 2019).

For this thesis the null hypothesis (H0) is, that there is no difference in ICT use and the perceived effect of ICT use between the respondents in the two response groups regarding age, education and teaching level.

The alternative hypothesis (H1) is, that there is a difference in ICT use and the perceived effect of ICT use between the respondents in the two response groups regarding age, education and teaching level.

For this project three different programs are utilized in order to achieve correct results: The Statistical Package for the Social Sciences (SPSS)⁸ and the StatPac⁹ calculator. SPSS is used as it has a graphical interface particularly designed for statistical calculations. SPSS allows for analysis such as the spearman test. The spearman test “[...] is a nonparametric measure of the strength and direction of association that exists between two variables measured on at least an ordinal scale” (Lærd statistics, 2018). The reason for this test is to make sure the survey is designed correctly in order to analyse the data. This test is designed to analyse surveys when Likert type questions are used, as they are in this survey.

When calculating statistical significance, the p-level is normally set at 0, 05 meaning the correlation is significant with 95% certainty (Investopedia 2019). A significance level of

⁸ The Statistical Package for the Social Sciences SPSS was first launched in 1968, and is among the most widely used software packages for statistical analysis in the social sciences and medical research. In addition to statistical analysis, the program includes data management and documentation support. <https://no.wikipedia.org/wiki/SPSS>

⁹ StatPac is free software for survey design and statistical analysis with multiple methods for data collection. Designed by Dr. David Walonick 2017. <https://www.statpac.com/index.htm>

0, 05 indicates that there is a 5% possibility that the results are due to chance. There are various tests that are used regarding significance depending on what is compared. For this thesis I use a two-sample t-test between percentages. This way it is possible to analyse the percentages from two groups with different base sizes. In the example bellow the statement from the survey: “I mainly use ICT in ESL teaching” is correlated with the response group “age under 40 years” to explain the process of calculation of significance. (The number of respondents surveyed for the various statements is found bellow the columns in the graphical charts: N=x.) To perform the calculations the program from StatPac is used.

- 67 respondents under 40 years were surveyed in the C and D municipalities, 81% mainly used ICT.
- 57 respondents under 40 years were surveyed in the control group, 65% mainly used ICT.

Enter the first percent: 81

Enter the sample size for the first percent: 67

Enter the second percent: 65

Enter the sample size for the second percent: 57

t-value = 2,015

Degrees of freedom = 122 Two-
tailed probability = .0461

The “two-sample” t-test between proportions is conducted to determine whether there was a significant difference between the C and D municipalities and the control group. The t-statistic in this calculation was significant at the 0.05 critical alpha level, $t(122)=2,015$, $p=.0461$. Therefore, I reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group was significant. To explain the t-test the following information is retrieved: “Mathematically, the t-test takes a sample from each of the two sets and establishes the problem statement by assuming a null hypothesis that the two means are equal. Based on the applicable formulas, certain values are calculated and compared against the standard values, and the assumed null hypothesis is accepted or rejected accordingly” (Investopedia, 2019). The “two tailed” probability is .0461, meaning the p-level is less than

the set p -level for significance of 0, 05 therefore, the test shows significance. There is less than a five percent probability that the difference is due to chance.

Note that the significance level in this small collection of data is merely a tool to shed some light on noteworthy connexions. Next the results from the survey will be displayed and briefly explained.

4. The results

In this chapter, graphical charts over C and D and the control group's statistics when it comes to ICT usage will be presented, and briefly explained. First, figure 3 shows how much the respondents use ICT in their ESL instruction. In order to get a more general overview of teachers' attitudes towards ICT and traditional teaching see [Appendix 2](#).

Next the respondents' age, education, and teaching level will be correlated with the teachers that mainly use ICT in their English instruction. Further, the respondents' age, education, and teaching level will be correlated with the perceived effect on ICT in English teaching to see whether these factors have an impact on the perceived effect of ICT.

At the end of the chapter the written answers where the respondents have accounted for how they use ICT in teaching, along with descriptions of how they use traditional learning aids, will be reviewed. The respondents' answers to the open questions in the survey will be presented in sub-chapters 4. 5 and 4. 6. (For a full overview of these answers se [Appendix 3](#)). The response distribution is based on all English teachers that participated in the survey, 325 respondents in total.

4.1 ICT vs. Traditional approach

The first two columns on the far left in figure 3 below show that there are few differences between the municipalities C and D and the control group when it comes to ICT usage. The two columns on the right show the teachers in the control group with students who have their own device or not, and to what degree the teachers mainly use ICT in their instruction. The statement they have responded to here reads, "I mainly use ICT when I teach English, like, smart practice apps, writing on PC and so on".

Figure 4 shows the use of traditional methods. This figure shows that there is somewhat more use of traditional methods in the control group than in the C and D municipalities. The reason for this may be that not all students have access to their own digital device and a more

traditional approach is required. It is evident from the two left columns in figure 3, that the respondents answer that they use ICT quite a lot in comparison to traditional teaching aids, as shown in figure 4. When the dark green and light green areas (totally agree and agree to an extent) of the columns are added 71% state they mostly use ICT in the C and D municipalities, and 70% say so in the control group. In figure 4, 19% mainly use traditional teaching methods in C and D municipalities and 26% in the control group. The two columns on the right show the teachers in the control group whether the students have their own digital device or not, and to what degree the teachers mainly use ICT in their instruction.

In charts 3 and 4 the y-axes show the percentage of ICT/ traditional use, and the x-axes show the five Likert type response possibilities along with the survey groups.

Figure 3. I mainly use ICT when I teach English, like digital platforms, smart practice apps, writing on PC and so on.

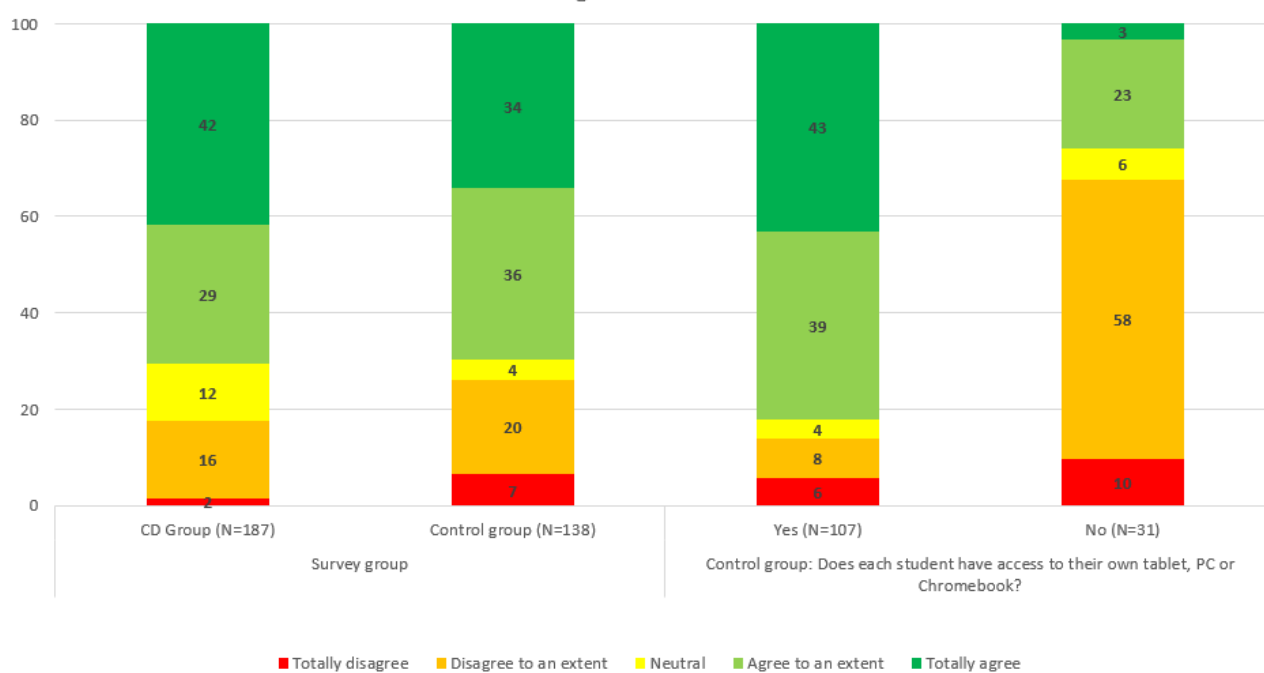
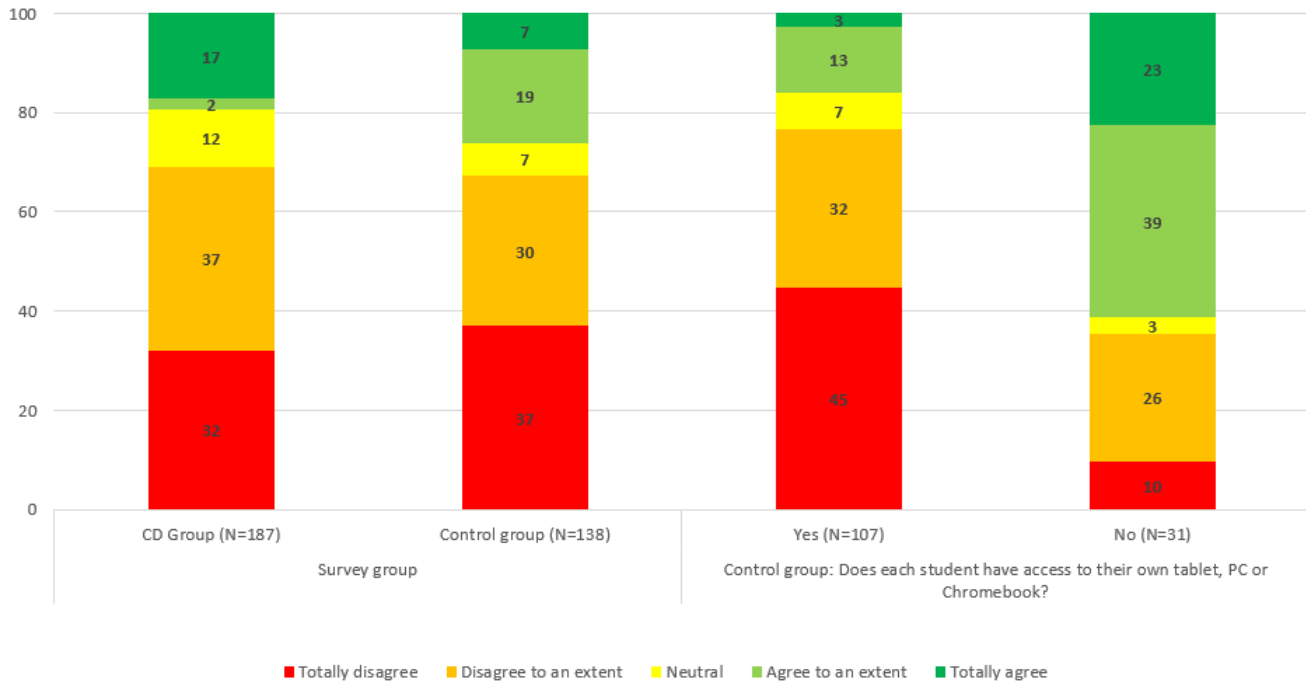


Figure 4. I mainly use traditional teaching aids like the textbook and pen-to-paper assignments when I teach.

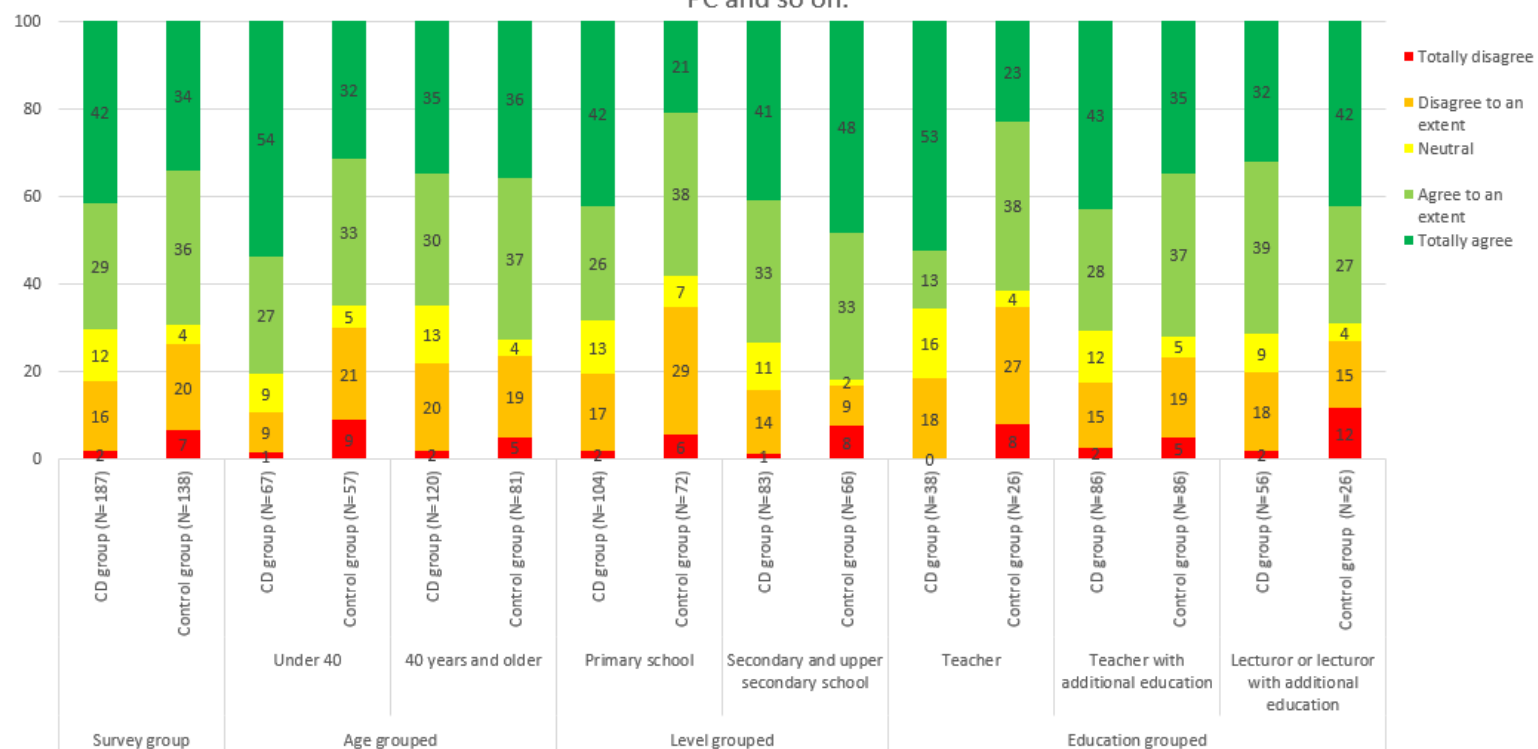


4.2 Age, education and teaching level compared

In this sub-chapter the statement, “I mainly use ICT when I teach English, like digital platforms, smart practice apps, writing on PC and so on” is cross-referenced with age, education and the level in which the respondents teach, such as elementary school or upper secondary school. In the charts following the findings are presented in percentages. In the sub-categories, the actual number of respondents is displayed along the x-axis.

In the graphical chart in figure 5, the x-axis also shows the various age groups, teaching levels, and the teachers’ education. The y-axis shows the percentage of participants, whether they totally agree, agree to an extent, are neutral, disagree to an extent, or totally disagree with the statement concerning their main use of ICT in their instruction. As made clear by the colouration of the graphical columns there are more teachers who agree to an extent or totally agree with the statement referring to a main use of ICT in their teaching. All results are presented in sub-chapters 5, 2 and 5, 3 where the charts are discussed in light of previous research.

Figure 5. I mainly use ICT when I teach English, like digital platforms, smart practice apps, writing on PC and so on.

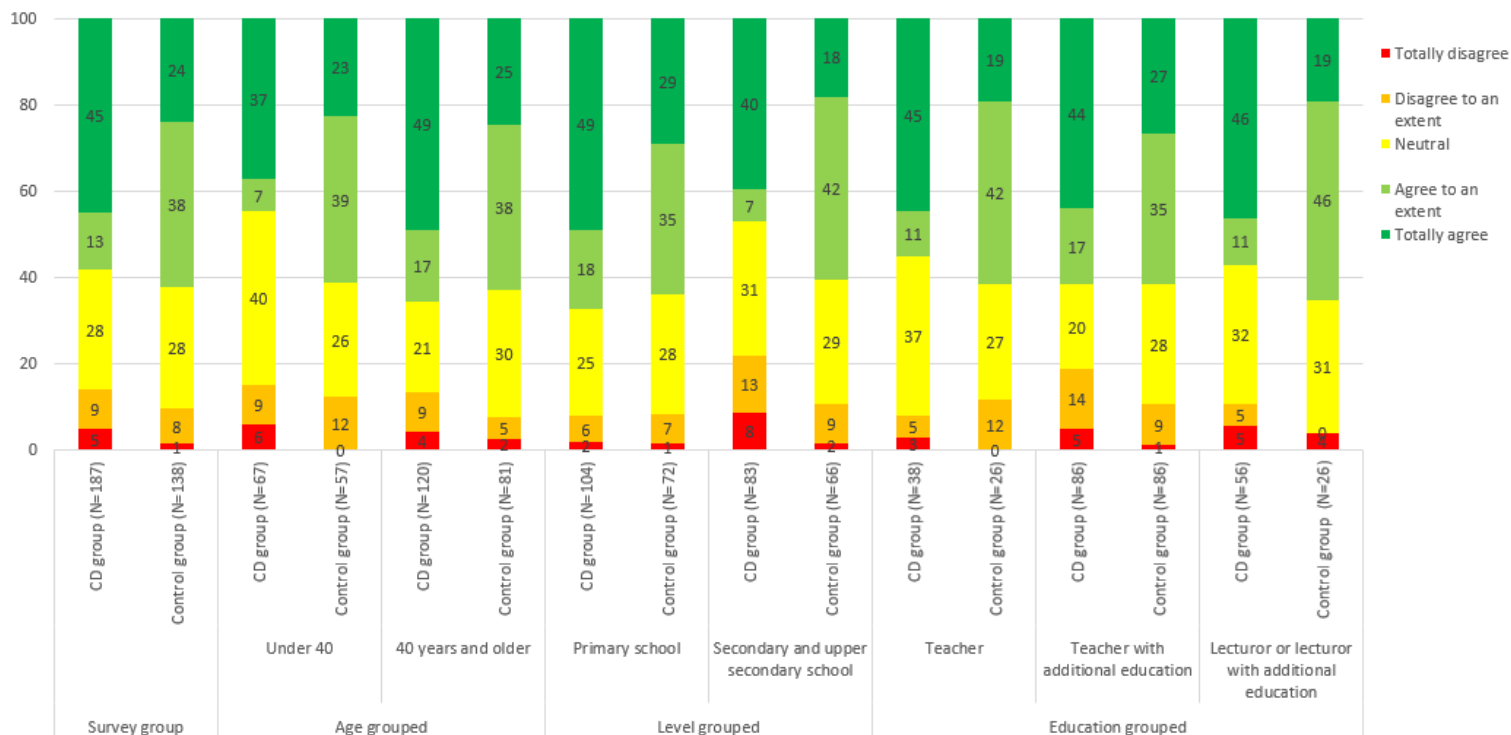


4.4 Age, education, and teaching level and perceived high effect of ICT

In the following chart in figure 6, the x-axis shows the various age groups, teaching levels, and the teachers' education in both the C and D municipalities and the control group. The y-axis shows the percentage of participants whether they totally agree, agree to an extent, are neutral, disagree to an extent or totally disagree with the statement heading the chart.

The graphical chart clearly shows that most teachers see a high effect of ICT in ESL teaching. The two columns at the far left show the two survey groups. When the dark and light green sections in each column are added, in the C and D group 58% see a high effect of ICT and in the control group the number is 62%.

Figure 6. Based on my own experience, I can see a higher effect on learning attainment with ICT use.



The last two questions of the survey were open, asking the teachers to describe the way they work with **ICT** and **traditional teaching aids** (See [Appendix 3](#)). There is no noteworthy distinction between the answers from municipalities C and D and the various other municipalities, and as most of the teachers work in schools where the students have their own device these answers have not been separated in the appendix, nor in the following sub-chapters.

4.5 What do teachers say about their own practices using ICT

The description of ICT work includes a large variety of digital platforms, apps and smart practice programs, and learning games, which will not be described in detail in this sub-chapter. The feedback on ICT work in teaching is mainly positive, and several respondents state that ICT gives opportunity for an improved overview of all students' achievements and progression. In the original answers to the survey all respondents gave their answers in Norwegian. This means that all quotes in the text are translations made by me.

The students can hand in assignments via audio or video files. ICT makes students more independent and it motivates the students. It is particularly positive for students with learning disabilities. The teachers often state that with the use of ICT it is easier to adjust and differentiate the levels of teaching material without making students aware of their differences in learning abilities. The programs used for writing contain aids for vocabulary, text correction and grammar, which is very helpful. Moreover, ICT can facilitate the development of learning strategies. The students can co-write, and when it is time to receive feedback, ICT has readymade solutions for teacher response as well. Current news can be found online, something that is deemed to be very positive, as the textbook often is outdated. Technological aids prepare the students for real life, and ICT can be a contributing factor to learning to a larger degree than before ICT entered the classroom, due to the advantages mentioned. Following are some quotes from the teachers answering question 16, "Can you write in short what you believe «teaching English with ICT entails?»"

"There is a lot of game playing if they (the students) get to choose, and I am not sure about the effect of it!" (Referring to the effect on learning attainment).

"It is expected that we use ICT, but there is no clear guidance from our management on how to go about it. Some years there has been a focus on using OneNote, but it wore off, one year it was "trendy" with smartboard and flipped classroom. All these things come and go makes no one (teachers) really work with ICT, but do their own thing, because students are expected to learn ICT and use ICT, whatever it is? ICT is a bit confusing for me; it can be so many things".

"We only work digitally. We do not have textbooks. Almost all writing is via computer. Dictionaries are digital. Texts and tasks are digital. Pupils record videos and audio files

digitally and hand in tasks digitally. Assignments for the students that the teachers create themselves are distributed digitally to the students. The only thing we do not do digitally is to read novels [...].”

“My students will be studying at colleges and universities next year, and if I had been using traditional teaching aids, I think they would be rather helpless in their new life as students”.

“Teaching English via ICT means using digital tools when it is appropriate. ICT is a partner that helps me (the teacher) reach further. ICT gives me more opportunities, not least when it comes to customization and assisting students to become producers. It (ICT) does not make the teaching worse or better - that is what I do”.

(By digital work) “Then I mean that we use iPad the same way as we used pen and paper before. In addition, there are several opportunities to vary the teaching with for instance: Listening, recording audio, [...] creating movies, making book reviews with sound and pictures, co-printing, and providing digital feedback”.

“Glossary training with “Quizlet” Collaborate through “Quizlet live”. Writing in the cloud is more motivating than writing in a book. Writing in the cloud makes it easier to collaborate”

“In text production, I use only Word because of editing possibilities, spelling check and so on, (the students) experience this as very useful”.

These quotations and the ones in sub-chapter 4. 6 will be further discussed in light of theory in chapter 5, 4. Following is the description of the teachers` accounts of traditional work.

4.6 What do teachers say about their own practices using traditional teaching aids

The answers regarding traditional work in ESL instruction contain quite a balanced portion of positive and negative remarks. Many teachers state that using the textbook for reading and as a basis for oral discussion is consistent with traditional teaching. Traditional textbook-based teaching also gives ample opportunities for practicing pronunciation. In describing what traditional work entails, the majority of the respondents mention writing in notebooks, worksheets, rulebooks, dictation, mind map, and glossaries, these are recurring examples.

Some of the more negative notes include that the teacher is more restrained by the progression of the textbook, more so than by the curriculum. There is less variation in the work and there is less room for adjustment to the various students' attainment level. The traditional work is said to be less motivating for the learners, more time consuming, and has a tendency to be about learning by heart.

The positive comments include the opportunity for the students to be more independent, while writing without auto correction of the text. The traditional ways of working can for instance include singing. When reading a classical novel in book form, the student can reflect quietly and there is less cause for temptations such as social media, online news or games. Reading without the possibility to multitask online leads to more focus on the reading material. Following are some quotes from the teachers answering question 17. "Can you write in short what you believe 'teaching English with traditional teaching aids' entails?"

"It is not about a struggle for or against/ ICT versus traditional teaching, where one leads to language learning and the other method does not. There is a lot of language learning and using a variety of different forms of work, some of them digital and some traditional. How teachers use these in combination is crucial" (to learning attainment).

"Some students like to write by hand, for instance. I think it's quite ok. Some worksheets are nice to have when we work with grammar, and use repetition and fill in the blanks- tasks".

“Old- fashioned text, totally uninteresting to youngsters”.

“For me it (traditional work) means using a textbook and work book, filling in missing words in grammar assignments, memorizing new words and giving regular tests. Reading the textbook and translating”.

“Perhaps with the exception of the first year I worked as a teacher, I have never worked that way. I have mostly taught on levels 1-4. I have always focused on oral activities in the form of small sketches, word games, games, etc. The use of animals and finger puppets as a starting point for conversations between persons and animals and so on. But ... I have ALWAYS been careful about reading and translating, the material we are working with and learning the content thoroughly, but without cramming new words”.

One respondent referred to research that claims that the pen on paper method promotes the learning of new words: “A lot of research shows that we learn better from writing by hand more so than writing on a computer”. Below follows my discussion.

5. Discussion

In this chapter, the results of the survey will be discussed in light of the theory described in chapter two. The data from all the charts in chapter 4 will be reviewed and compared. Lastly, this chapter will review the validity and reliability of this project. The focus of this thesis is on finding out teachers' attitudes towards ICT in their English instruction, furthermore, to see if there is a connection between their ages, education, teaching levels and perceived effect of teachers' ICT use.

5.1 Discussion of findings in light of previous research

The charts in chapter 4 have shown that teachers of all ages, types of education and teaching levels have very positive attitudes toward technology in this survey, including respondents from municipalities C and D along with a cross section of Norwegian municipalities, referred to as the control group. In this chapter follows a closer look at the numbers from figures 3, 4, 5 and 6 respectively.

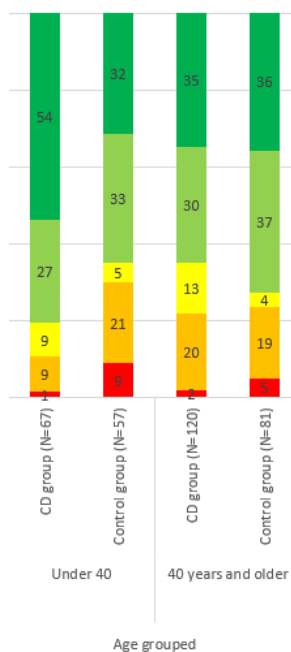
The first chart in chapter 4.1: [figure 3](#) clearly shows the strong positive attitude among the teachers surveyed in both C and D, and the control group. In the C and D municipalities, 42% of the respondents state that they totally agree that they mainly use ICT. 29% agree to an extent that they mainly use ICT, as opposed to traditional methods such as pen on paper writing, where only 17% of the participants state that they totally agree that they mainly use traditional methods, and merely 2% use them to an extent.

In the control group, 34% state that they totally agree that they mainly use ICT, 36% agree to an extent. 7% of the participants state they totally agree that they mainly use traditional aids and only 19% say they use traditional aids to an extent. Among the respondents with the highest ICT usage, the respondents from the cross section of Norwegian teachers use ICT 8% less than the C and D municipalities. The C and D municipalities use traditional teaching methods 10% less than the control group. The C and D-respondents have a high usage most likely due to the digital density of the schools with a focus on ICT implementation.

The ICT usage among the respondents in this survey is all over very high. This is not in agreement with the data that Ottestad et al. present. They maintain that the proportion of Norwegian teachers who frequently use various digital tools in teaching is considerably lower than the international average (Ottestad et al., 2013, 31). The focus of the next sub- chapter is on how teachers of various ages, types of education, and teaching levels use ICT in instruction.

5.3 Age, experience and teaching level

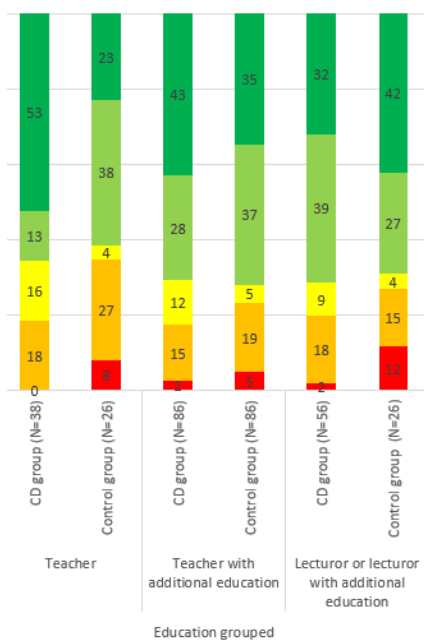
In this chapter, the charts bellow will be reviewed and the results from the two respondent groups, municipalities C and D and the control group, will be compared and discussed in light of theory. Sections of the various variables from [figure 5](#) will be used to demonstrate the findings in visually accommodating graphical charts, displaying age, education and teaching level. All assessments are based on the two green sections (totally agree and agree) of the columns added together and subsequently compared. Note that as mentioned earlier the columns in the graphical charts may show 99-101% due to the rounding up of the decimals in the excel sheet.



Age: In the C and D municipalities, the group under 40 years who totally agree and agree to an extent to mainly using ICT, is 81%. The chart shows that the older the participants are, the less they are inclined to use ICT in instruction. In the answers from the group 40 years and older, the number is 65%. There is 16% less ICT usage in the oldest group, in the C and D municipalities.

It is the opposite for the control group. 65% of the respondents under 40 years mainly use ICT in instruction. ICT use is 8% higher in the oldest response group, 40 years and older. The C and D municipalities have the highest usage in the response group under 40 years, there is significant difference between the ICT use in the C and D municipalities under 40 years and the ICT use in the response group under 40 years, as explained in the example in [sub-chapter 3, 4](#). (See [appendix 4](#), figure A, for significance calculation).

To sum up, in [figure 5](#), the C and D municipalities' chart shows that the ICT usage is highest among the youngest respondents. In the control group it is the opposite, it is higher among its oldest respondents. To revisit some of the theoretical framework from chapter two, the numbers from the youngest teachers in C and D municipalities are in accordance with Prensky's findings (2001, 4). The cross section of Norwegian teachers on the other hand contradicts the theory of Prensky, as this is the group that uses ICT the least. Prensky claims that the young are digital natives and the new generation has a different set of cognitive skills than the generations before them. He claims that the digital natives are adapted to technology and bored by today's education (2001, 4). The results in my study here support Prensky's results. There is an upsurge in the numbers in the older participants' use of ICT in the cross section of Norwegian teachers. This generation is not expected to use ICT to this large degree, according to Prensky, as they are not as accustomed to digital devices as their younger colleagues. The high ICT usage does, however, suggest that the politicians' and school owners' objective to incorporate ICT in instruction in all levels of teaching, is a nationwide realization, perhaps due to the education of teachers.



Education: The section of the chart in [figure 5](#) that shows education, displays quite an even distribution of ICT usage among the participants. In municipalities C and D, the participants with the least education are the ones who claim to use ICT the least. Among teachers¹⁰ the green areas which show the ones that totally agree and agree to an extent to mainly using ICT combined make up 66%. Among teachers with additional education¹¹ the number is 71%, and in the highest educated group, lecturers¹², and lecturers, with additional education¹³ the number is also 71%. This is not a large difference, yet it may indicate that a higher education results in more ICT- confident teachers.

In the control group, within the same category the numbers are- 61%,72%, and 69% respectively. When comparing the C and D municipalities with the control group, the C and D municipalities score higher, they use ICT 5% more than the control group. In the teachers with additional education-response group, the results are almost identical between the two groups, differing a mere 1%. The control group scores higher. In the highest educated response group, the difference between the C and D municipalities and the control group is also minimal with 2%. The C and D municipalities score higher. There are no significant differences between the two response groups regarding education and the use of ICT in ESL teaching (see [appendix 4](#), figures C, D and E). Similar responses such as these invite little discussion. Had for instance the most educated group had significantly higher numbers, one might argue that education has an impact on ICT usage. On the other hand, as these numbers are so similar it could rather be argued that a teacher who is genuinely eager to convey a new teaching method, regardless of education, has a better chance of getting through to the students than a teacher reluctant towards the new method. Note that the most recently educated primary school teachers now also hold a master's degree, meaning that newly

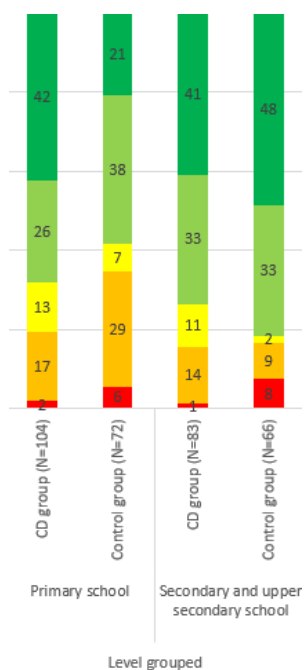
¹⁰ A teacher has a four years university education.

¹¹ A teacher with a five years university education is referred to as a teacher with additional education for the purpose of this thesis.

¹² A teacher who holds a full university degree is called a lecturer (cand.phil., cand.real etc, Master of Arts, Master of Science).

¹³ A lecturer with additional education has 60 credits from a university course in addition to a Master's degree.

graduated primary school teachers are lecturers. The higher degree of education among teachers teaching the youngest students, may indicate that Sađlam and Sert's statement about teachers without a specific ICT education (Sađlam and Sert 2012, 12), is true. As mentioned they claim that even without an education that included ICT specific focus teachers see ICT as important. The education for elementary teachers is five years of university and results in a Master's degree. This may also be the reason that the percentages are so similar (to read more about the teachers' views on own education regarding ICT, see [Appendix 2](#), figure 11, and sub-[chapter 5, 3](#)).



Teaching level: The section of the chart in [figure 5](#) that shows teaching levels displays that the levels that use ICT the most in C and D municipalities, are secondary and upper secondary school. Their percentage of ICT use is 74%. These levels are closely followed by primary school with 68%. Teachers working on the lower levels have the least amount of ICT use. This is in agreement with Gilje et al.'s claim that upper secondary school has the most IT use (Gilje et al., 2016, 71). Also in the control group the highest use of ICT is among the respondents working in secondary and upper secondary school. Their levels are 81%. This is slightly higher than in the C and D municipalities, 7% higher to be exact, this is not a significant difference (see [Appendix 4](#), figures F and G).

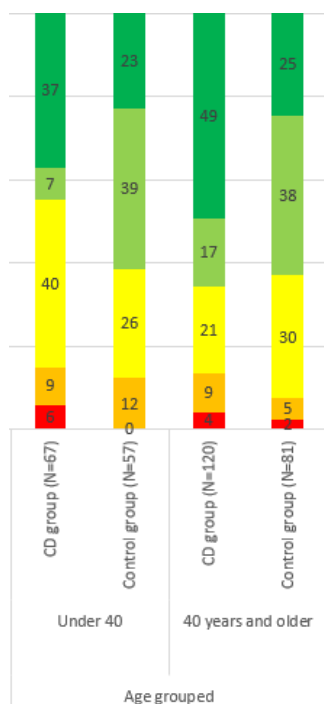
Gilje et al. state that in upper secondary school, more than 50% of the teachers say that they mainly use ICT teaching in their English lessons. (Gilje et al., 2016, 71). The findings in this survey show a higher ICT use among the respondents than in the survey Gilje et al. refer to. As mentioned, Gilje et al. claim that teachers in primary school prefer paper-based teaching aids primarily, and see digital learning aids as supplements (Gilje et al., 2016, 24), something that is not the case among these respondents. Primary school has almost the same

level of ICT use as secondary and upper secondary school in the C and D municipalities, and a 22% difference in the control group between the two response groups. Gilje et al. also state that there are relatively large variances in the use of digital and paper-based teaching aids in primary and secondary schools. According to Gilje et al. more than 60% of teachers state that they largely use paper-based learning aids in primary school (2016, 71). In C and D and in the control group traditional teaching is rated by teachers as significantly lower than 60 % (See [Appendix 2](#), figure 9, and [figure 4](#)). Consequently, ICT usage in this survey is higher than in the study by Gilje et al. However, there might be dangers linked to teachers' high motivation to implement ICT in their ESL teaching. Karavanidou et al. claim that the degree of teacher enthusiasm toward ICT is a factor that may reduce the credibility of ICT. There might be an overusage of ICT despite the lack of scientific evidence of its benefits due to extensive use, resulting in diminished learning attainment among students (Karavanidou et al., 2017, 157-158).

Next, the same aspects, age, education and teaching level will be reviewed with the additional aspect of the teachers' perceived outlook on student attainment due to ICT. 5.3

5.4 The high perceived effect of ICT

Following is an account of the perceived effect of ICT usage among the participants in municipalities C and D, and the cross section of Norwegian municipalities regarding age, education and teaching level. The respondents largely claim that they can see improved results when working with ICT in ESL teaching. This chapter looks into whether the aspects of age, experience and teaching level have an impact on the respondents' perceived effect on students' learning attainment due to the reported high ICT usage. At the end of this sub-chapter the teachers' assessments of their own ICT education will also be described briefly.



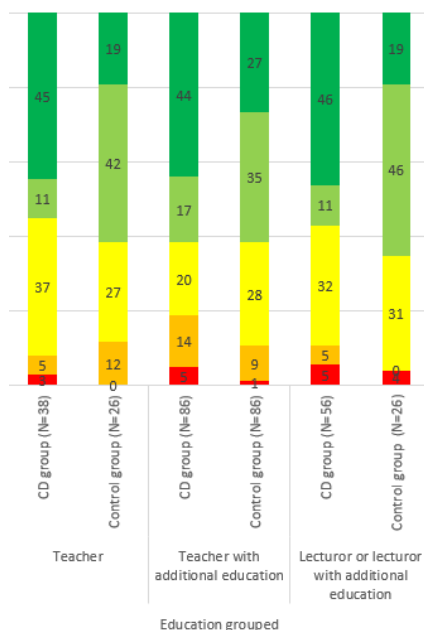
Age: In [figure 6](#), the chart section that shows the two groups, under 40, and 40 and older, the youngest respondents in municipalities C and D, claim to see a poorer effect of ICT than the oldest respondents do. The youngest age groups' perceived high effect of ICT is 44%. In the age group 40 years and older, the number is as much as 66%. What is interesting when comparing the charts displaying C and D municipalities to the same response group in [figure 5](#), is that the group of teachers that mainly use ICT in their teaching incrementally declines with age, yet the perceived effect of ICT increases in the age group 40 years and older. The perceived high effect of ICT increases in the age group that uses ICT the least, while the youngest teachers under 40 use ICT the most, and still see the least effect of ICT usage. There is a

significant difference between the perceived high effect of ICT use between the C and D municipalities and the control group within the response group younger than 40 years (see [Appendix 4](#), figures H and I).

One way of interpreting this is that when there is less ICT use, the teachers see a higher effect of ICT. Another reflection is that the experience of an older teacher may promote the students' learning. Perhaps a more practised teacher is able to assess when and how ICT is the most beneficial to students. A teacher with less experience may not see when it is wise to apply ICT in ESL instruction, possibly resulting in a misguided over usage such as

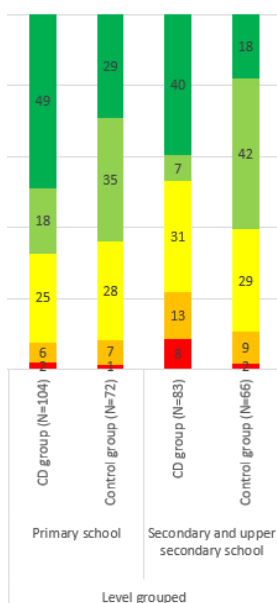
Karavanidou refers to (2017, 157-158). As mentioned students do not learn from ICT alone, unless they have relevant objectives in clear context with a current topic from the English subject (Gilje et al., 2016, 73) and (Li and Ni 2011, 73). In a municipality where politicians, and, as a result of political pressure, the school management also stress the importance of ICT in all subjects, an over usage may be the result (see [Appendix 2](#), figure10, for information on how respondent experience management expectations on ICT usage in instruction).

In the control group the two groups of respondents have almost identical percentages of high perceived effect of ICT with only one percent difference. The age group 40 and older is the group with the poorest perceived effect on learning attainment due to ICT compared to ICT usage. In this group 73% mainly use ICT, yet only 63% see a high effect due to the digital teaching method. It is interesting that also here the age group that uses ICT the most sees the least effect on learning attainment from the use of ICT with their students, however marginal the numbers are. It is, however, in full concurrence with the theoretical framework, where digital drilling and practice software used to acquire languages, show a negative connection with results on learning attainment (OECD 2015, 190). Moreover, the Pisa study mentioned earlier, concludes that the highest ICT use among students in the OECD nations is among Norwegian students (OECD 2010, 134). Even so, Norwegian students have had the largest drop in skills and knowledge from 2003 to 2009 (OECD 2010, 134). The decline of learning attainment in Norwegian students concurs with the findings in this survey, which shows a lower percentage of high perceived effect of ICT, in connection with elevated use of ICT in instruction.



Education: Among the respondents in the C and D municipalities, the group that state they to the largest degree see a higher effect from ICT in instruction is teachers and teachers with additional training, with 61%. The other groups within the C and D municipalities have rather similar numbers ranging from 56% for teachers, and 57% for lecturers/lecturers with additional education. When compared with [figure 5](#), the perceived effect of ICT is less than the use of ICT among adjuncts and adjuncts with additional education (see [Appendix 4](#), figure J, K and L for statistical calculation).

In the control group all levels of education have similar percentages of high perceived effect of ICT, with 61% for teachers, 62% for teachers with additional education and 65% for lecturers and lecturers with additional training. This means that there is a slightly increased high perceived effect of ICT among the most highly educated teachers in the control group, however, no significant manifestations. As mentioned, Sağlam and Serć's (2012, 12) study found that teachers without any specific ICT in their own education still claimed that technology contributed to foreign language learning progress. This may be an explanation for why the numbers are so similar.



Teaching level: When it comes to the level in which the respondents teach, such as primary school or secondary school, the C and D municipalities have results that contradict the findings from previous research. In [figure 6](#), the section that shows teaching levels, it is shown that of the respondents in the group that teaches primary school 67% claim they see a higher effect of ICT. While in the group that works with secondary and upper secondary school only 47% see a higher effect of ICT in instruction. This is a rather large difference of 20% were the

group that uses ICT the most in [figure 5](#), sees the least effect of ICT on students' learning attainment.

In the control group, there is less difference between the levels. In the group that teaches elementary school, the percentage that claim they see a higher effect of ICT is 64. In secondary and upper secondary level the number is 60%, this is the levels where teachers use ICT the most. This means that also here the group with the most usage sees the least effect of ICT. However, there are no significant differences between the two groups when it comes to high perceived effect of ICT use in teaching (see [Appendix 4](#), figure M and N).

Teachers nationwide see ICT as a tool that is positive for students. Moreover, researchers have confidence in that teachers' attitudes toward technology is the main reason for success (Hatlevik and Arnseth 2012, 1; Atkins and Vasu 2000, 281; Seraji et al. 2017, 177; Zhao et al. 2002, 495; Mueller et al., 2008, 1526; OECD 2015, 191). However, as mentioned, the efficiency of technical incorporation is further rooted in pedagogical and design values, rather than technology itself (Li, and Ni 2011, 73). The majority of the respondents in this survey have a positive outlook on ICT and many claim to see a high result due to ICT usage in English instruction. In this they contradict the findings of van der Meer and van der Weel (2017), which show how pen on paper writing is vital for learning attainment. Van der Meer and van der Weel's research from 2018 clearly shows the importance of traditional learning. More areas of the brain, associated with learning, are active while writing on paper, rather than on a digital device (van der Meer and van der Weel 2018, 1, 7). Mueller and Oppenheimer (2014) and Wollscheid (2016) show similar results in their studies. Particularly for younger students it would be logical to assume that a pen on paper method would be preferable over a digital method, as much research claim that pen on paper writing and working in the traditional ways is vital for cognitive development (Longcamp et al., 2008; Mueller and Oppenheimer 2014; Fortunati and Vincent 2014; Berninger et al., 2009a; Dinehart, 2014; Longcamp et al., 2003, 2008, 2011; Dinehart and Manfra; 2016, Mangen and Balsvik, 2016; Karavanidou et al. 2017; van der Weel and van der Meer 2018).

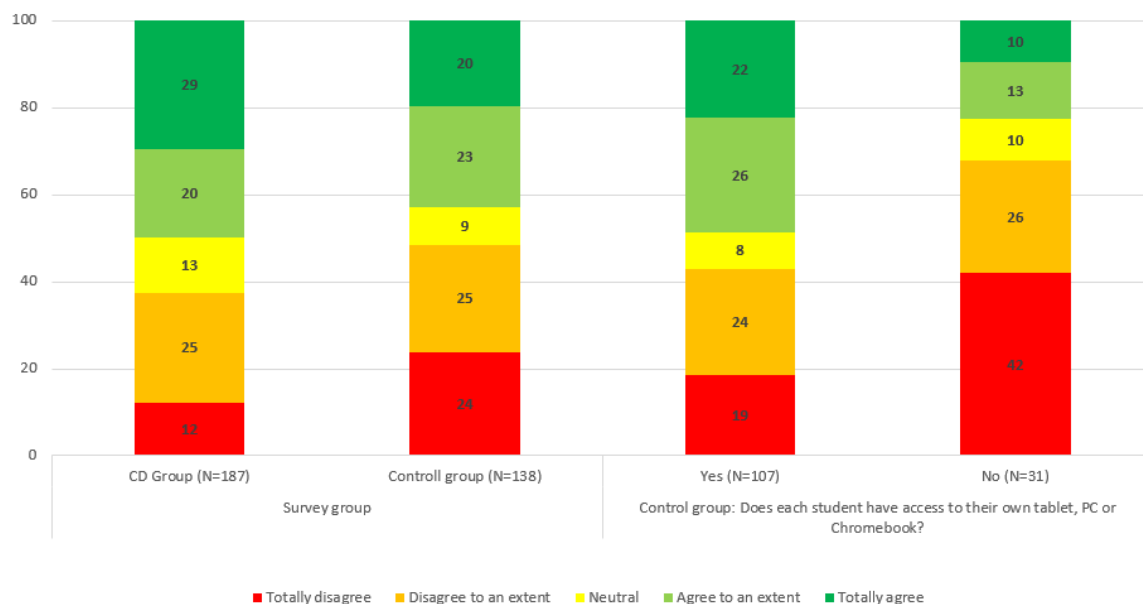
According to previous research, the proportion of Norwegian teachers who frequently use various digital tools in instruction is significantly lower than the international average (Ottestad 2013, 31). These findings do not correspond to the findings in this survey.

Previous research claims that the use of ICT is extensive in upper secondary school, more so than at lower levels (Gilje et al., 2016, 71). The results of the present survey contradict Gilje et al.'s findings, as the lower levels teachers use ICT as much as the teachers at the higher levels, and in some cases more, as in chart figure 5, in municipalities C and D. The respondents in this material have a high usage of ICT. This is also the case for respondents in relation to age and teaching levels.

This leads to the question, do teachers feel that they are sufficiently educated to assess when it is prudent to apply ICT in ESL instruction? In figure 10 and in [Appendix 2](#), the teachers' own accounts of their training are presented.

The following chart shows that in the C and D municipalities 13% remain neutral to the statement, "I feel I have enough training to use ICT efficiently in my English classes". 25% disagree to a certain extent, while 12% totally disagree. 20% agree to a certain extent, and 29% totally agree that their ICT training is adequate. In the various other municipalities as much as 24% of the teachers totally disagree that they have enough ICT training. 25% disagree to an extent, while only 9% remain neutral. 23% agree to an extent and 20% say they totally agree that their ICT training is good enough. These numbers indicate that a majority of the teachers think that they have adequate educational background in ICT.

Figure 10. I feel I have enough training to use ICT efficiently in my English classes.



Below follows the teachers' account for how they work with ICT and traditional teaching aids, discussed in light of theory.

5.5 Teachers' answers to questions 16 and 17 in light of theory

In this sub-chapter some of the information and quotes from chapters 4, 5 and 4, 6 are revisited. The answers the teachers gave to the question "Can you write in short what you believe teaching English with ICT entails?" and, "can you write in short what you believe teaching English with traditional teaching aids entails"?, will be discussed in light of my theoretical framework

Using ICT in ESL teaching

Prensky argues that the students of today need ICT to learn (2001, 4- 5), and the high ICT use in ESL teaching may lead to the assumption that the teachers in this survey to a large degree concur with Prensky's theory. However, it may be argued that teachers miss a clarification of how to use digital aids to improve teaching (Tømte et al., 2018, 72). The following quote from a respondent is such an example of a teacher who is unsure of how to apply ICT in instruction.

"It is expected that we use ICT, but there is no clear guidance from our management on how to go about it. Some years there has been a focus on using "OneNote", but it wore off, one year it was "trendy" with smartboard and flipped classroom. All these things come and go makes no one (teachers) really work with ICT, but do their own thing, because students are expected to learn ICT and use ICT, whatever it is? ICT is a bit confusing for me; it can be so many things"

Technology should be a means for reaching a specific objective for a subject (Zhao et al., 2002, 489). The teacher quote above reflects the frustration of not having a clear guideline to follow. Students do not learn from ICT unless they have concrete and relatable aims that relate directly to the subject (Gilje et al., 2016, 73). Moreover, Haugsbakk finds the substantial ICT implementation in schools problematic. He claims that the focus on teacher

pedagogies is at the expense of the students and the students' learning process (2011, web), something the following quote from my survey may be an indication of:

“My students will be studying at colleges and universities next year, and if I had been using traditional teaching aids, I think they would be rather helpless in their new life as students.” This is in concurrence with Wikan and Mølster who state that schools have to follow the technological developments so that the students are prepared for the digital society (2009, 1).

The teachers' answers to the open questions also reflect doubt whether learning via ICT work is really attained, one respondent says: “There is a lot of game playing if they (the students) get to choose, and I am not sure about the effect (on learning attainment) of it!”. Learning games and various other platforms for drilling new words digitally are mentioned extensively by teachers in the material. For instance they mention: “Glossary training with “Quizlet”, collaboration through “Quizlet live”. Platforms such as these and others recur among the answers. Although drilling is seen as unfortunate for learning attainment, drilling exercises seem to be used extensively (OECD 2015, 190). Moreover, it is argued that the importance of writing with pen on paper to activate the parts of the brain particularly connected to learning is much neglected due to the extensive digital work (van der Weel and van der Meer 2018, 1). Many of the teachers in this survey swear by text programs used for writing as they contain aids for vocabulary, text correction and grammar, which teachers claim are very helpful to students. Consider this quote for instance: “In text production, I use only Word because of editing possibilities, spelling check and so on, (the students) experience this as very useful”. This response contradicts the importance of the cognitive benefits from pen on paper writing repetition. As mentioned, the quality of written texts improves because students accomplish better self-regulation from pen on paper writing. Students' working memory is triggered to a higher degree (Bara and Gentaz, 2011; Berninger et al., 2009a, 2009b; Connelly et al., 2007; Cunningham and Stanovich, 1990; Longcamp et al., 2005; Smoker et al., 2009; Velay and Longcamp, 2010; Karavanidou 2017, 154). There is also the matter of balance between pen on paper method and the usage of digital aids. Some teachers only focus on ICT for written work, as illustrated in this quote for instance: “We only work digitally. We do not have textbooks. Almost all writing is via computer. Dictionaries are digital. Texts and tasks are digital. Pupils record videos and audio files digitally and hand in tasks digitally. Tasks for the students that the teachers create themselves are distributed digitally to the students [...]”.

This level of teacher enthusiasm towards ICT was claimed by Karavanidou et al. as unfortunate for student learning attainment, as there is no certain proof of ICT's superiority to traditional methods (Karavanidou 2017, 157-158). Moreover, previous theory (OECD 2015, 190) even claims that teaching in this one sided manner may have a negative effect on the attainment of learning. The OECD report states that technology sometimes distracts from valuable human interaction needed to learn a language (OECD 2015, 3). However, not all statements were as resolute as the previous one. Some accounts are more neutral in their view of ICT in ESL teaching, such as the following: "Teaching English through ICT means using digital tools when it is appropriate. ICT is a partner that helps me (the teacher) reach further. ICT gives me more opportunities, not least when it comes to customization and assisting students to become producers. It (ICT) does not make the teaching worse or better - that is what I do".

The important difference between the two quotes above is that in the first one the respondent lets ICT take over completely, compared to the second one, which makes ICT a valuable partner to enhance students' learning attainment via motivation. Using ICT in teaching is in line with Prensky who states that digital natives need ICT because of their technology rich upbringing (2001, 4). It gives opportunities for swift feedback and developmental assessments, consequently causing more personalised learning (OPCD 2015, 191) Likewise, the students claim they are motivated by ICT (Tømte et al., 2018, 61). According to Johnson, teachers who use inquiry-based, project-based, problem-based or co-operative pedagogies often like to use ICT in their teaching (Johnson et al., 2014, in OPCD 2015, 191). One teacher claimed that: "Writing in the cloud is more motivating (to students) than writing in a book. Writing in the cloud makes it easier to collaborate". As mentioned, human collaboration is undoubtedly positive for learning attainment (OECD 2015, 3). However, a reflection concerning learning collaborations such as this is important, is sitting in separate houses writing in a shared document in the cloud, the equivalent to human collaboration? Some teachers even say they have completely eradicated pen and paper: (By ICT in ESL) "[...] I mean that we use iPad for the same as we used pen and paper before, in addition to that there are several opportunities to vary the teaching with e.g.: Listening, recording audio, create movies, write book reviews with sound and pictures, co-print, record sound when discussing something, (and) provide digital feedback".

With van der Weel and van der Meer's research in mind, this invites reflection. To sum up this sub-chapter, the attitudes of the respondents are positive towards ICT. The respondents' answers to the survey say that technological aids can help prepare the students

for real life, and ICT can be a contributing factor to increased learning. The feedback on ICT work in teaching is mainly positive, and several state that it gives opportunity for an improved overview of all students' achievements and progression as well as opportunities to facilitate for the individual student's learning. According to a large number of the respondents, ICT in ESL education makes students more independent and it motivates them.

Using traditional teaching aids in ESL teaching

The answers regarding traditional work in ESL instruction contained an equal portion of positive and negative remarks. Many stated that using the textbooks for reading and as a basis for oral discussions was consistent with traditional teaching. Traditional textbook-based teaching also gave ample opportunities for practicing pronunciation. With traditional work, the majority of the respondents mentioned writing in notebooks, worksheets, rulebooks, dictation, mind maps, and glossaries, these were recurring in the teachers' statements.

Some of the more negative notes included that the teacher is more restrained by the progression of the textbook more so than the curriculum. There is less variation in the work and there are reduced possibilities for adjustments to the various students' attainment levels. The traditional work is frequently said to be less motivating to the learners, more time consuming, and has a tendency to be about learning by heart.

The positive comments included the opportunity for the students to be more independent, while writing without auto correction of the text. The traditional ways of working could include singing. When reading a classical novel in book form, the student can reflect quietly and there is less cause for temptations such as social media, online news or games. Reading without the possibility to multitask online, leads to more focus on the language material.

Following are some quotes from the teachers' answers to question 17. "Can you write in short what you believe teaching English with traditional teaching aids entails?" The first statement shows a reflected and neutral viewpoint: "It is not about a struggle for or against ICT versus traditional teaching where one leads to language learning and the other does not. There is lots of language learning and using a variety of different forms of work, some of them digital and some traditional. How teachers use these in combination is crucial". This is a good example of the importance of the teacher. The unique knowledge the teacher possesses about each student and how important it is to facilitate the lesson in a way the students benefit the most from it. It is also in accordance with Atkins and Vasu 2008, Hatlevik and Arnseth

2012, Zhao et al., 2002, Seraji et al. 2017, who all say the teacher is the most important piece in the puzzle of ICT in teaching. It is also illuminating to read the following quote from my study, as it represents the students who actually enjoy using the pen to paper method, and perhaps understand that this is the method by which they learn the most language:

“Some students like to write by hand, for instance. I think it is quite ok. Some worksheets are nice to have when we work with grammar, and use repetition and fill in the blanks- tasks”

“For me it (traditional work) means using a textbook and work book, filling in missing words in grammar assignments, memorizing new words and giving regular tests. Reading the textbook and translating”.

“Perhaps with the exception of the first year I worked as a teacher, I have never worked that way. I have mostly taught on levels 1-4. I have always focused on oral activities in the form of small sketches, word games, games, etc. The use of animals and finger puppets as a starting point for conversations between people and animals and so on.

But ... I have ALWAYS been careful about reading and translating, the material we are working with and learning the content thoroughly, but without cramming new words”. The above statements correspond to the conclusions drawn by researchers like Gilje et al, who claim that the use of ICT is not as extensive at the lower levels of education (Gilje et al. 2016, 71).

5.6 Validity and reliability

In this sub-chapter, the validity and reliability will be under scrutiny. Validity entails precise and exact results acquired from the retrieved data in the survey. The total number of respondents from the two selected municipalities is 187. The response percentage was 62 out of a total distribution of 279 requests. This means that out of all surveys distributed more than half of the teachers answered. The number of respondents from the control group is 138, the response percentage here was 53 out of 233 requests in total. This adds up to 325 respondents to the survey in total. Any response percentage over 50% is quite high, however there are too few respondents to be able to see the survey as anything more than an indication of the attitudes of the entire population of Norwegian teachers. When the base size, meaning the

number of respondents, is as limited as in this survey it is important to interpret the answers given carefully. It would be interesting to explore more municipalities to achieve a larger base size and get a more conclusive result of the survey. If too much is read into a category with less than thirty respondents, the outcome of an interpretation of the entire graph will be incorrect. As some of the responses have less than thirty respondents, measures have been made to avoid faulty interpretations, such as merging several categories together to avoid too small response groups in certain categories. It is important to note that answers from this survey, with a moderate base size, should merely be interpreted as tendencies of a wider population's attitudes. In order to get a more conclusive result from the survey a larger response group must be approached.

There will always be some uncertainty associated with the results when we ask a sample of the population. This uncertainty is the margin of error. The margin of error can be explained as a system for measuring how effective a survey is (Aksnes AS, 2019). The smaller the margin of error, the more you can trust the result. The higher the margin of error, the more the results may differ from the overall population's opinion, in surveys such as this, with 325 respondents, as mentioned, more respondents should be added in order to read more into the results. To explain the term margin of error this example retrieved from SurveyMonkey is useful; If 60% answers "yes" in a survey with a margin of error of 5% that means between 55% and 65% of the general population thinks the answer is "yes" (SurveyMonkey, 2019). However, in this thesis the entire population of English teachers is not known, so a margin of error, or a standard deviation cannot be calculated to an exact amount. As the total number of possible respondents is unknown in this case, a formula to override this problem is set into place. The numbers used in this thesis to calculate the margin of error is based on the total number of educators in each municipality, using Norwegian statistical central agency (SSB), combined with an assumption that ca 25% of the total number of educators, teach English. Using this fabricated calculation there are roughly 1656 English teachers in the C and D municipalities combined. Using this imagined figure as a basis and a confidence level of 95%, we can assume an error margin of ± 5 for the results from the B and C municipalities. To calculate the margin of error in the control group the same fabricated calculation is applied to the total number of teachers 151817 (SSB), the population size will then be calculated to be about 37954, which make the assumed margin of error at ± 8 . The term level of significance is often used to describe how substantial a result

of a survey will have to be deemed acceptable as oppose to chance. The calculation of statistical significance reveals how certain the results of a survey is.

Also, when the respondents were given the survey, the questions and statements were not rotated. This means that all respondents started with question one, and proceeded to answer the questions in the same numeral order. This gives possibilities for a pattern in the respondents' answers. It is reasonable to suspect that the first question is the one that is read most carefully by the respondents. The first question may then start a pattern of a set answer sequel. When all respondents start with the same question this may have an undesired effect on the reliability of the survey.

Next the distribution will be commented on due to two possible flaws regarding the distribution of the survey in the municipalities C and D municipalities well as in the control group. C and D municipalities: When the number of respondents remained low after approaching the principals and department managers, the link to the survey was distributed among all teachers found in the schools address lists. In doing so, teachers that perhaps did not read the E-mail thoroughly might have conducted the survey although English is not their primary subject of teaching. The risks of this are quite slim, considering the introduction in the survey (see [Appendix 1](#)). However, with an open link distributed in this fashion, there is a real risk that non-English teachers could have interfered giving irrelevant answers.

The control group: In order to reach respondents to get a cross section of the municipalities in Norway, the Facebook group "Engelsklærere" was approached. There are implications to be aware of when using this method. For instance, the fact that these teachers are active users of social media could imply that they might be more interested in digital possibilities available than teachers that are not members of the Facebook group. This might result in a favourable outcome for use of digital teaching aids due to the pool of respondents' positive attitudes towards ICT. As a result, this may interfere with the external validity. If these respondents, although they are from a wide range of municipalities from around the country, indeed are more prone to ICT solutions it may be challenging to generalize the study to a wider population. However, Facebook is a worldwide phenomenon and according to the SSB there has been an increase both in users' age and in their activities in the Norwegian population. In 2015, 54% of the population aged between 16 and 79 used social media daily. In 2018 there has been an increase of 12 percentage points, which means that 66% now use social media (SSB 2019). Since social media now are in the public domain, they were deemed reliable to

use in this context. However, it is noted that there might be a bias towards ICT use among the respondents of the survey. This may indicate that the pool of respondents might be considered somewhat unreliable. This aspect is taken into consideration in the conclusion that follows.

6. Conclusion

In this thesis, Norwegian ESL teachers' attitudes towards ICT have been examined. Correlations between age, education and the various levels of instruction have been made with teachers' perceived effect of ICT use in two selected municipalities with a particular focus on the implementation of ICT in all subjects. These findings have been compared to a cross section of Norwegian municipalities. The questions answered are:

1. *What are the attitudes of English teachers in two Norwegian municipalities with a special focus on ICT towards digital teaching methods, versus more traditional methods?*
2. *To what extent does the teaching practice of English teachers in the selected municipalities include digital approaches, and to what extent do they find such approaches to be effective?*
3. *How do teachers' attitudes in the selected municipalities compare to teachers' attitudes in other municipalities in Norway, with regard to age, education level and teaching level?*

The teachers' responses in this material indicate that ICT is a tool that is considered to be positive. The survey shows that the teachers found ICT approaches to be effective, in the sense that they offer a ready overview of students' achievements and progression, as well as provide opportunities to facilitate the individual students' learning. Respondents say ICT in ESL education facilitates the process of giving individual feedback. The attitudes towards ICT in ESL teaching were positive within the C and D municipalities, as well as in the cross section of Norwegian municipalities.

The number of teachers that mainly use ICT in their teaching is considerably higher than the number of teachers that use traditional teaching approaches the most. However, the results from this survey are not generalizable since the number of respondents is relatively low. Moreover, the total population of teachers who teach English remains unknown so

numbers from the survey have a provisional margin of error of $\pm 5\%$. The control groups' provisional margin of error is $\pm 8\%$.

According to the results of the survey, 42% of the teachers in the C and D municipalities state that they totally agree that they mostly use ICT in their instruction. In the various other municipalities 34% say the same, meaning that the participants from the C and D municipalities use ICT 8% more than the teachers in the cross section of Norwegian teachers. Among the respondents that answer that they totally agree to mainly using traditional teaching methods, 17% say so in the C and D municipalities, and 7% in the control group. In the C and D municipalities 45% state that they totally agree that they find ICT effective, and 13% agree to an extent. In the control group 24% totally agree and 38% agree to an extent. When it comes to teachers' attitudes towards ICT in ESL teaching in relation to age, education and teaching level, the findings are as follow.

Age: The results from the C and D municipalities show that the oldest teachers use ICT 16% less than teachers who are 40 years or younger. Yet, it is the opposite for the control group, where the teachers 40 years and older use ICT 8% more than their younger colleagues. When comparing the data from the two groups there are statistically significant differences between the C and D municipalities and the cross section of Norwegian municipalities. The t-statistic in this calculation was significant at the 0.05 critical alpha level, $t(2,015)=122$, $p=.0461$ among respondents younger than 40 years. The C and D municipalities have the most ICT usage. Regarding perceived high effect of ICT in teaching the t-statistic in this calculation was significant at the 0.05 critical alpha level, $t(2,000)=122$, $p=.0477$. The control group sees the highest effect of ICT use. So, there is a less than five percent probability that these differences are due to chance.

When it comes to the effect these teachers see of ICT in their ESL instruction, the group of teachers that mainly use ICT incrementally declines with age in the municipalities C and D. The C and D municipalities have the most ICT usage. However, the perceived effect of ICT increases in the age group 40 years and older.

Education: When it comes to education, the control group have the highest level of ICT usage among the teachers and teachers with additional education with 72%. The results for ICT usage compared with education are very similar for all response groups. The group

that saw the best effect of ICT in instruction is lecturers and lecturers with additional education, within the control group. In the C and D municipalities the percentage for ICT use is higher than the perceived effect of ICT among teachers and teachers with additional education, although the difference in numbers are modest. There are no statistically significant differences between the two groups.

Teaching level: The levels that use ICT the most in the C and D municipalities, are secondary and upper secondary school. Their percentage is 74%. Primary school has 68%. Teachers who work at lower levels use ICT the least.

In the control group the highest use of ICT is also among the respondents working at secondary and upper secondary school levels, with 81%. This is 7% higher than in the C and D municipalities. In the C and D municipalities the respondents that teach primary school claim they see a higher effect of ICT, their percentage is 67%. However, in the group that works with secondary and upper secondary students only 47% see a higher effect of ICT in instruction. This is a difference of 20% where the group that uses ICT the most, sees the lowest effect of their ICT usage. Regarding the perceived high effect of ICT on learning attainment, in the control group, the teachers that used ICT the most also saw the least effect on learning attainment. There are no statistically significant differences between the C and D municipalities and the control group.

When comparing the two selected municipalities with the control group it is evident that the ICT usage is extensive all over and that the respondents' attitudes are positive. The selected municipalities include digital approaches to a large extent in ESL teaching, much more than they include traditional approaches such as the pen on paper method. The cross section of Norwegian municipalities has equal numbers to the C and D municipalities when it comes to ICT use, even though these municipalities might not have the same focus on ICT implementation in all subjects as the C and D municipalities.

Highly educated teachers who have the most ICT usage, see the least effect of ICT. According to this survey education has the least impact on ICT usage and perceived effect of usage among teachers.

The group that used ICT the most saw the least effect on learning attainment from ICT. This might imply that better learning results may be achieved when less ICT is used in teaching, and that teachers need to reflect more regarding how and when ICT use is advantageous in ESL education. As I have shown the official strategy of implementing ICT in

English teaching has led to increased use in Norwegian classrooms. However, the effect on learning outcome is, according to my results, debatable.

Notes

1. Prøitz, Tine Sofie. Beskrivelser av læringsutbytte - startpunkt og sluttunkt *Læringsutbytte*. Oslo: Universitetsforlaget. 2018.
2. Definition of ICT for this thesis: By “ICT” in this thesis, it is meant digital platforms, digital learning apps, and smart practice apps, writing on a keyboard and reading on a screen such as a Chrome book, an iPad or personal a computer.
3. Definition of traditional teaching for this thesis: By traditional teaching, it is meant, writing/ drawing with pen on paper, using the textbooks and workbooks, notebooks, and reading without the use of a screen.
4. Øystein Gille, Teacher Convention in Oslo 02.01.2019.
5. OECD is an organisation for economic cooperation and development with 36 member countries, founded in 1961.
6. Vavik, Lars. et al. Skolefagsundersøkelsen 2009 - utdanning, skolefag og teknologi. Stord: Høgskolen Stord/Haugesund. 2010. Conference Presentation at “FOU i praksis”, Trondheim, 10.05.2010.
7. TED is a non-profit organisation devoted to spreading ideas, usually in the form of short, powerful talks (18 minutes or less). TED began in 1984 as a conference where Technology, Entertainment and Design converged, and today covers almost all topics from science to business to global issues.
8. The Statistical Package for the Social Sciences SPSS was first launched in 1968, and is among the most widely used software packages for statistical analysis in the social sciences and medical research. In addition to statistical analysis, the program includes data management and documentation support. <https://no.wikipedia.org/wiki/SPSS> Last accessed 06.10.2019.
9. StatPac is free software for survey design and statistical analysis with multiple methods for data collection. Designed by Dr. David Walonick 2017. <https://www.statpac.com/index.htm> Last accessed 22.09.2019.
10. The Norwegian term “Lærer”’: Is a teacher with 4 years of education at university level <https://utdanning.no/yrker/beskrivelse/adjunkt/> Last accessed 22.09.2019.
11. The Norwegian term “Lærer med tilleggsutdanning”’: Is a teacher with five years of education at university level. <https://www.udir.no/verktoy/ordbok/> Last accessed 22.09.2019.

12. The Norwegian term “Lektor”: Is a teacher who holds a full university degree (Cand.phil., Cand.real, Master of Arts, Master of Science) or who possesses qualifications recognised as equivalent to a full university degree
<https://utdanning.no/yrker/beskrivelse/adjunkt> Last accessed 22.09.2019.
13. 60 credits are the equivalent of one year of education at university level. A lecturer with an extra year of education will hold the title, “Lecturer with additional education”. <https://www.samordnaopptak.no/info/opptak/poengberegning/legge-til-poeng/tilleggs-poeng/> Last accessed 22.09.2019.

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Appendices

Appendix 1. Questionnaire

“Hi English teachers!

This survey is for a master’s thesis at the University of Halden. The thesis is about teachers’ attitudes towards ICT and traditional teaching methods in their English classes. Your experiences on the matter are important.

I hope you can take the time to answer this short (4-5 minutes) anonymous survey as honestly as you can. All boxes must be checked.

Thank you all in advance!”

1. What is your age?

- 20-29
- 30-39
- 40-49
- 50-59
- 60-69

2. How much work experience do you have teaching? (Years)

- 1-3
- 3-5
- 5-10
- 10-15
- 15-20
- 20-25
- More than 25

3. What kind of education do you have?

-
- Teacher
- Adjunct
- Adjunct with additional
- education Lecturer

Lecturer with additional education

1. On what level do you teach English?

1-4

5-7

8-10

Upper secondary school

Please answer the statements below using one check box:

2. I mainly use traditional teaching aids like the textbook and pen-to-paper assignments when I teach:

Totally disagree

Disagree to an

extent Neutral

Agree to some

extent Totally agree

3. I mainly use ICT when I teach English, like smart practice apps, digital platforms and writing on a key board.

Totally disagree

Disagree to an

extent Neutral

Agree to some

extent Totally agree

4. Place the glider where you believe it to fit the best regarding your ICT/ traditional teaching aids-use.

Mostly ICT

Rather a lot of

ICT ICT to some

extent

Equal amount of ICT and traditional teaching

aids. Traditional teaching aids to some extent.

Rather a lot of traditional teaching

aids Mostly traditional teaching aids.

5. Pen- to paper assignments are important to learning English

- Totally disagree
- Disagree to an extent
- Neutral
- Agree to some extent
- Totally agree

6. ICT is important to learning English.

- Totally disagree
- Disagree to an extent
- Neutral
- Agree to some extent
- Totally agree

7. Based on my own experience, I can see a higher effect on learning with ICT use.

- Totally disagree
- Disagree to an extent
- Neutral
- Agree to some extent
- Totally agree

8. Based on my own experience, I can see a diminished effect on learning with ICT use.

- Totally disagree
- Disagree to an extent
- Neutral
- Agree to some extent
- Totally agree

9. Based on my own experience, I can see a higher effect on learning with traditional teaching aids, like textbooks and pen-to-paper assignments.

- Totally disagree
- Disagree to an extent
- Neutral
- Agree to some extent
- Totally agree

13. Based on my own experience, I can see a diminished effect on learning with traditional teaching aids.

- Totally disagree
- Disagree to an extent
- Neutral
- Agree to some extent
- Totally agree

14. The management at my school encourages ICT use in English classes.

- Totally disagree
- Disagree to an extent
- Neutral
- Agree to some extent
- Totally agree

15. I feel I have enough training to use ICT efficiently in my English classes.

- Totally disagree
- Disagree to an extent
- Neutral
- Agree to some extent
- Totally agree

16. Can you write in short what you believe «teaching English with ICT» entails?

17. Can you write in short what you believe «teaching English with traditional teaching aids» entails?

Appendix 2. General overview of remaining survey results

In the following charts 7- 11, a general overview of the remaining accounts from the survey not shown in the running text, is displayed.



Figure 8. Based on my own experience, I can see a diminished effect on learning with traditional teaching aids.

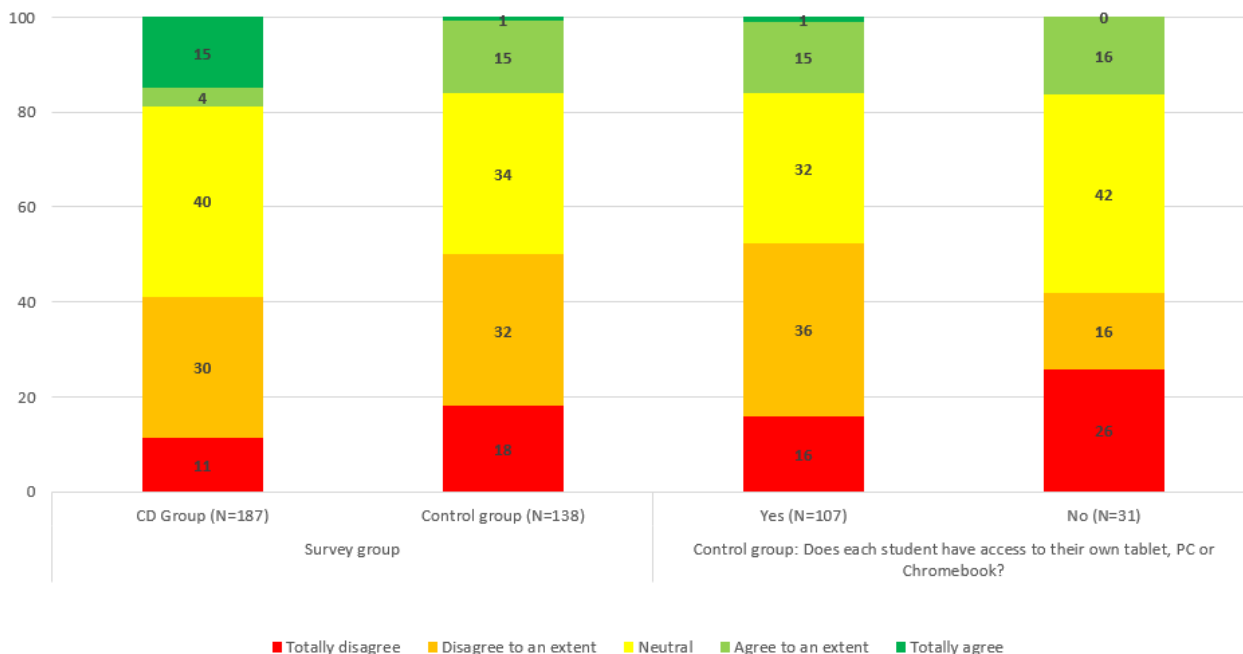


Figure 9. Place the glider where you believe it to fit the best regarding your ICT vs. traditional teaching aids use.

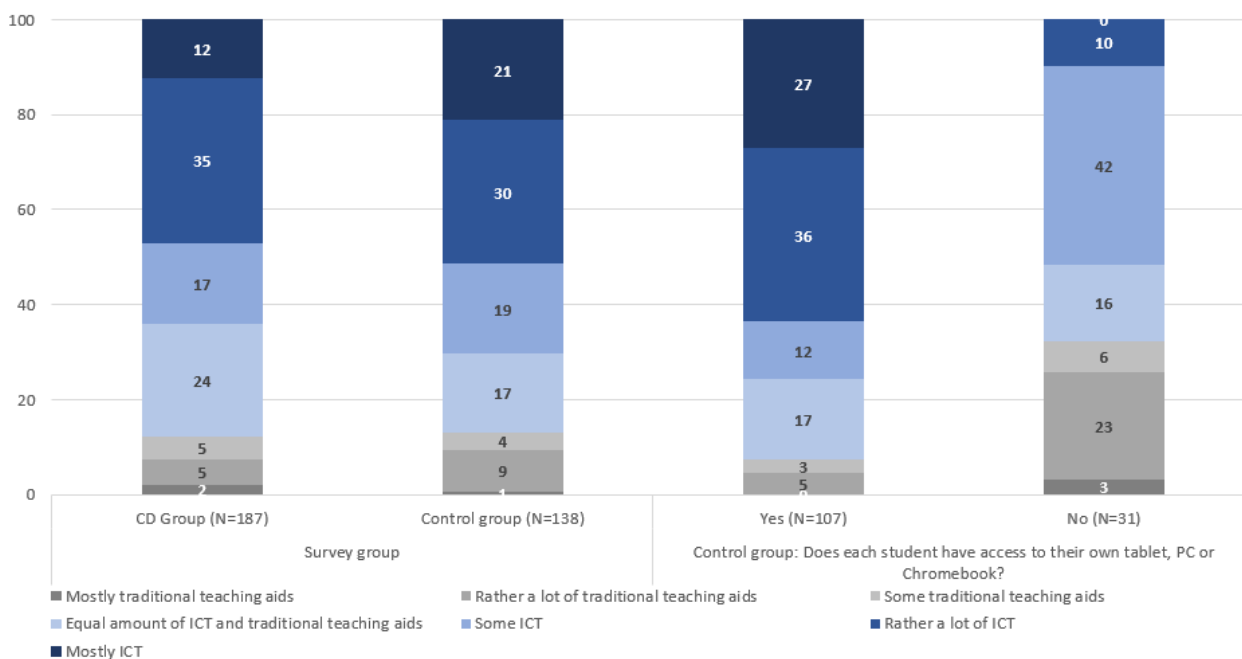


Figure 10. The management at my school encourages ICT use in English classes.

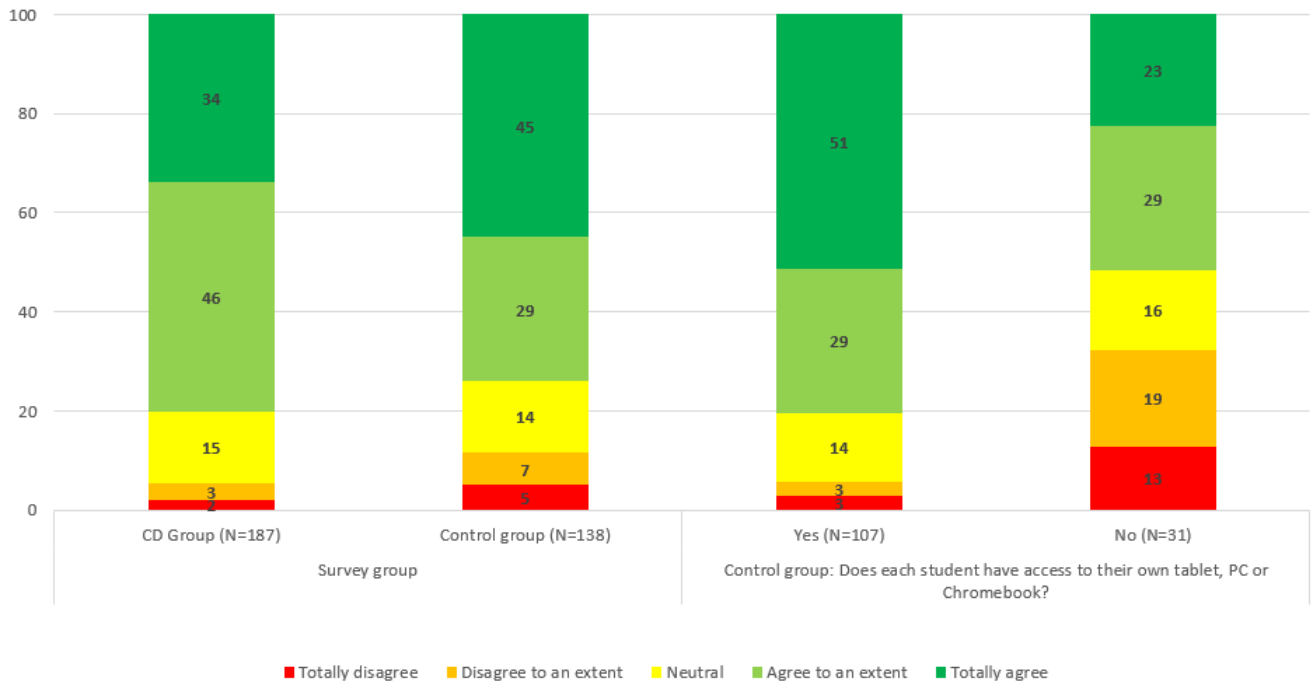
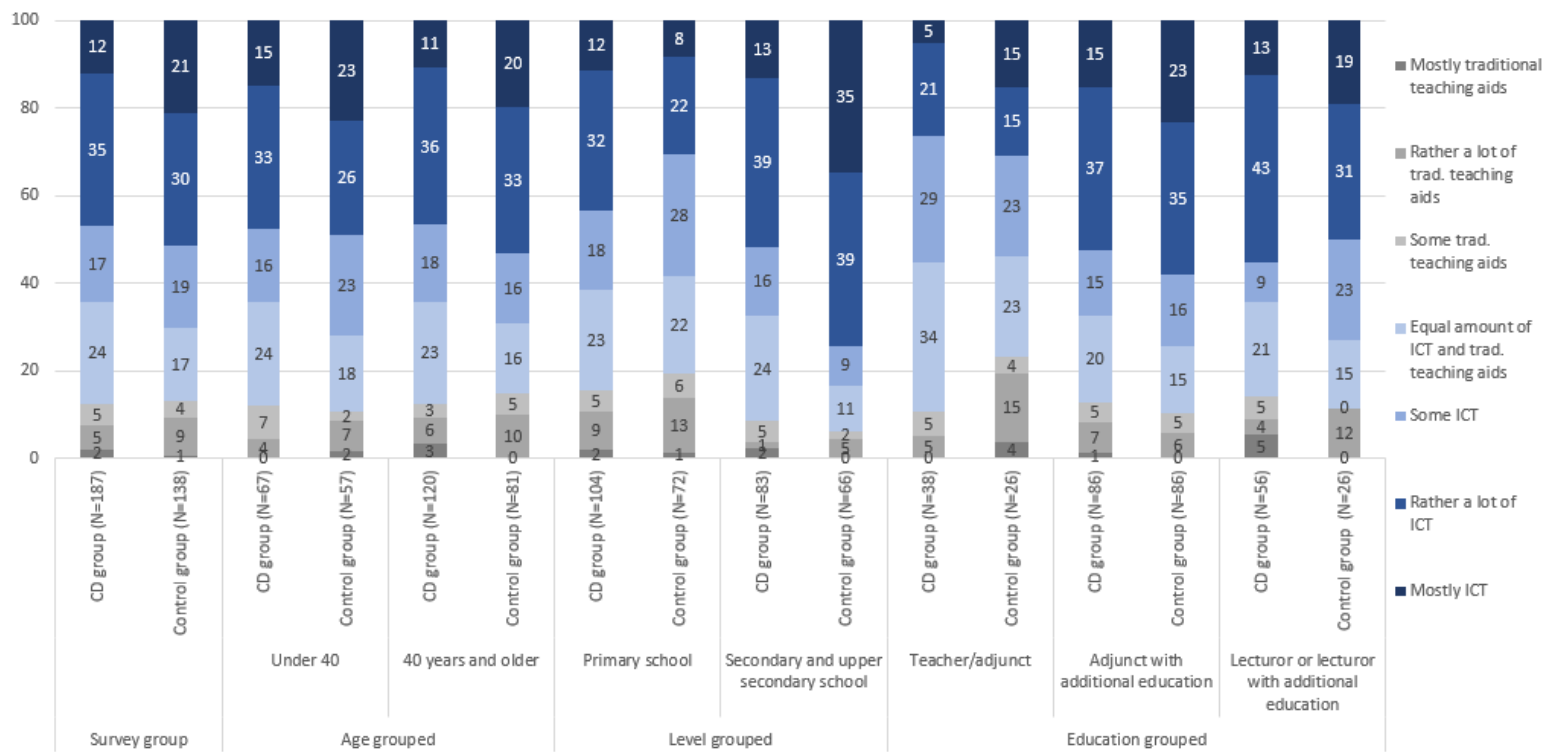


Figure 11. I feel I have enough training to use ICT efficiently in my English classes.



Appendix 3. Teachers' answers to question 17 and 18 from the survey

Here we can find the unedited list of original answers in Norwegian. The questions from the survey were as follows:

17. Can you write in short what you believe «teaching English with ICT» entails?

18. Can you write in short what you believe «teaching English with traditional teaching aids» entails? The respondents answered with short key words or short sentences.

Question 17. Can you write in short what you believe «teaching English with ICT» entails?

- Å bruke presentasjonsverktøy, IKT plattform Its Learning til oppgaver og innleveringer, video snutter PP , omvendt classrom osv.
- Bruk av interaktive sider, benytte læringsplattformer aktivt i undervisningen.
- Bruke apper, youtube
- Innhenting av tekster/kilder til bruke i egen tekstproduksjon.
- Lage filmer, podcast, taleopptak, presentasjonrr, hente informasjon engelske nettsted, bruke ordbøker på nett, lese autentiske tekster på nett
- Undervisningsfilmer og interaktive oppgaver (f.eks: lydlære, dialektlære, grammatikk, litteratur, kultur) Informasjonsinnhenting, Samskrivingsverktøy, Presentasjonsverktøy Kommunikasjon lærer/elev, Vurderingsarbeid, Tilbakemelding
- Oppgaver på nett, søke informasjon
- Da mener jeg at vi bruker iPad til det samme som vi brukte penn og papir til før, i tillegg til at det er flere muligheter til å variere undervisningen med f.eks.: Lytte, ta opp lyd, gjøre oppgaver basert på film, lage filmer, lage boktrailere med lyd og bilder, samskriving, ta opp lyd når de diskuterer noe, gi digitale tilbakemeldinger,
-
- -Bruk av skriveprogram
- -Hjelpemidler som ordbøker (enklere å søke opp enn å slå opp i bok)
- - innhenting av informasjon på nett
- - Smart-tavle tilhørende læreverk
- - digitale oppgaver i differensiert nivå
- - lek og spill på nett som kan være engasjerende i språklæring
- - retteprogram (highlight tool)
- Grammatikkoppgaver på nett, samskriving i Google Docs, Quizlet, online spill på engelsk
- Digitale virkemidler
- Bruk av skriveprogram i stedet for penn og papir. Skriveprogrammet har ulike hjelpemidler for rettskriving, vokabular og grammatikk. Ulike typer quiz-apper for å lære ordforråd og faktakunnskap om engelske land, som kahoot, quizlet. Nettsider for grammatikkøving Videoprogrammer som Screencastify. Bruk av ulike nettressurser for å finne informasjon Bruk av læringsvideor og ressurser fra youtube Bruk av elevs egne datamaskiner
- Bruke ulike former for digitale verktøy i timer og lekser. Jeg bruker det til å spille inn lydfil i leselekser og lage små skuespill på film. Fungerer godt for de som ikke tør å være aktive i timene. Bruker også quizlet osv.
- Online grammatikkøvelser
- Quizlet for ordinnlæring
- Youtube vidoer
- Delt dokument i CB
- Har ingen kommentar
- Benytte CB som verktøy, gir mulighet for elver til å lage gode presentasjoner. ulike apper som oppvarmingsøvelser, teksttiltale funksjon på maskin er nyttig for de som strever med det skriftlige, Digitalt læreverk gir rom for å lytte til tekster både i fellesskap og individuelt, det har gode øvelser som gir umiddelbar respons. Filmsnutter i grammatikk

IKT kombinert med tradisjonell bok gir mulighet for variert og mer elevmotiverende undervisning.

- ✓ Nei
- ✓ Alle elevene har nettbrett. Mesteparten av skriveingen foregår på iPad, alle lekser leveres der.
- ✓ Bruker Showbie mye for talenotat - de høre meg, bedre lytte strategier. De leverer inn opptak - øving av muntlige engelsk. Jeg leser inn takster, hjelper med lesing. Lett å ta opptak på to nivå — sakte og vanlig tempo. Elevene kan velger hva de vil høre på. Bruk av internett for å finne fakta til presentasjoner.
- ✓ Bruk av: Tavlebok Salaby Quizlet Creaza - Cartoonist, mindomo
Google presentasjoner, dokumenter...
- ✓ Nettbøker
Lytteeksempler
Spill, Øvelser i grammatikk, Videoer
- ✓ bruke ipad, lage filmer, se filmer, høre på sanger og lydfiler, ulike kilder, lære kildekritikk
- ✓ Muligheter til tilpasning slik at ikke eleven ser det. Alle arbeider på sin iPad med tildelte oppgaver. Uttale og relevans utenfor klasserommet er lettere å innføre.
- ✓ Bruker brettbok, Google Classroom som arbeidsplattform, Showbie, It's Learning til innleveringer.
- ✓ ipad, brettbok, nettsider, lese inn tekst på showbie
- ✓ Lære dem å bruke nettressurser på en hensiktsmessig måte, bruke internett for å «lære å lære» samt bearbeide og filtrere informasjon, kunne bruke språkverktøy som Clarify på samme måte som en ordbok. Kunne lage presentasjoner, videoer, talenotater etc for å fremme grunnlaget for vurdering i flere disipliner, også for de som ikke tar initiativ i timen.
- ✓ Bruk av lydfiler til å lese inn og lytte til elevens Innlesing og uttale
Bruk av lydfil for elevene å lytte til innleste tekster
Bruk av undervisningsfilmer
Innlæring av grammatikk
Elevene lager egne filer i grammatikk
Wb online
- ✓ Lyd og bildestøtte. Opptak av egne leselekse. Lytteoppgaver. Digitale verktøy i tekstarbeid.
- ✓ Showbie, Explorer, Youtube
- ✓ Bruke digitale hjelpemidler både i min forklaringsdel og elevenes utførelsesdel. At IKT brukes i den delen av undervisningen der jeg mener det er hensiktsmessig.
- ✓ varierte arbeidsmetoder, lytter enkelt til engelsk imens vi leser tekster (lærebok digitalt). Stor fordel at elever kan gi lydopptak der de snakker/leser engelsk. Da får lærer hørt alle, uten at det tar masse tid i undervisningen.
- ✓ Digitale læreverker
Lytting
Varierte arbeidsoppgaver
Finne informasjon - refleksjon
Kildekritikk
Spill som læring
Selvstendighet
- ✓ iPad. Elevene skriver lengre tekster på iPad.
De leverer alle skriftlige lekser på iPad (men jeg ber de ofte skrive for hånd, ta bilde og levere inn). Dette fordi det da blir mer oversiktlig for meg hvem som har levert inn, hvem som hyppig glemmer leksene osv. Vi bruker mye filmklipp o.l. i undervisningen, mye ift. lytting og muntlig trening.
Elevene leverer ofte lydopptak i muntlige oppgaver.
De bruker også språk-apper til å trene på Engelsk.
De lager også presentasjoner på Keynote (Power Point), dokumenter i Book Creator, og filmer i iMovie.
- ✓ - Bruk av brettboka «Quest». Lytter og leser
- ✓ - Skriver og leser inn fortellinger i Explain everything
- ✓ - Jobber for det meste på iPad, Book Creator, når vi skriver i timen: my diary, bokanmeldelser o.l.
- ✓ - Bruker en del kahoot i undervisningen
- ✓ - Bruker digital ordbok (Clarify og Google translate)
- ✓ - Henter oppgaver fra salaby og lokus.no. deler linker via Showbie
- ✓ - Vi ser på film og bruker av og til youtube
- ✓ - Jeg bruker selv mye Keynote når jeg underviser
- ✓ - alt dette gir veldig gode muligheter for en tilpasset opplæring.
- ✓ Brettbøker med opplært tekst
Digital vurdering halvårsprøve og helårsprøve

- Stairsonline - nettoppgaver
- storyline online - lese/lytte/samtale om bøker
- quizlet til øving av gloser
- kahoot - terping av grammatikk/vocabulary
- brithish consule - mange gode varierte filmer/tekster/oppgaver på mange nivå
- Quest- grammatikk oppgaver
- News in English - nåvådelte tekster. Chromebook til alle elever:
- Innlevering av oppgaver/lekser med mulighet for tilbakemelding. Classroom med linker og oppgaver ligger klart. Mulighet for grupper å skrive i fellesdokument.
- Bruk av apper og nettsider på egne nettbrett
- Hente sanger fra youtube og synge med
- interaktive grammatikkoppgaver
- Kildebruk
- læringsplattformer
- Onenote
- filmsnutter
- informasjonsinnhenting
- pressreader
- Bruke digitale hjelpemidler, netressurser, arbeidsoppgaver, eller for eksempel at elevene jobber med netressurser eller program for å lage digitale produkter.
- Jeg bruker google classroom til å legge ut oppgaver, quizlet til gloser og google skjema til gloseprøver. De hører og ser masse engelsk på Chromebooken sin, vi ser på lydbok med visuell støtte sammen en gang i uka. Og det finnes mange gode nettoppgaver de kan gjøre for å øve seg.
- Kildebruk, Research, Sriving
- Se filmklipp, Vise bilder, Bruke digital ordbok
- Lese tekster, svare på spørsmål, gjøre oppgaver.
- Lytte på innlest tekst, lese inn tekst. Levere lekser med innlest tekst.
- Sanger, eventyr, lytte til bøker.
- gjennomgå gloser/flashcards.
- Bruke youtube til filmer og musikk.
- Elevene lager presentasjoner, skriver tekst.
- Quizlet
- Digital tavlebok
- Quizer og kahoot
- Det er å bruke film og la lever lese inn på I pad.
- PASser best for muntlig engelsk.
- NDLA
- Nettressurser til læreverk
- Wikipedia
- Britiske/amerikanske nettaviser
- YouTube Google-
- søk Digital
- lærebok
- Bruke digitale hjelpemidler for å skrive tekster. Bruk av skrivestøtte.
- Innlæring av gloser ved bruk av nettsted, f.eks Quizlet.
- Bruk av læreverkets nettressurser.
- Lese digitale tekster med feks lesestøtte.
- Lese inn tekster i lekse, sende til lærer.
- Ikt er kanskje bruk av datamaskin eller chromebok, noe vi begynte med for to måneder siden. Jeg vil tro at det brukes mer IKT på 2. og 3. trinn. På 1. trinn bruke mest muntlig øvelser, sang, rim, fortellinger, at læreren hilser på engelsk om morgenen, at vi snakker om været på engelsk og at vi bruke ressurser på youtube og via Quest smart tavle. Vi ser en del på videoer som Steve og Maggie, Kids 123, Mapleleaf Learning og mer.
- Bruker ikt ved tekstproduksjon, tekstlesing og lytting, samt noe øving av grammatikk. Bruker i all hovedsak papir når ny grammatikk skal innlæres, og ikt stort sett på alt annet.
- Stairs online
- Lytte til elever som leser tekster på iPad, rette opp feil på uttale
- Vise tekster som elevene har skrevet, på storskjerm, og medelever får komme med konstruktive tilbakemeldinger
- Det forventes at man bruker IKT, men det er ingen tydelige føringer fra ledelse på hvordan man skal gjøre det. Noen år har det vært fokus på å bruke OneNote, men det dabbet av, et år var det «hot» med smartboard og flipped classroom. Alle disse tingene som kommer og går gjør at ingen egentlig jobber målrettet med IKT, men gjør sin egen greie, fordi det

forventes at elevene skal lære det...hva det nå enn er? IKT er litt diffust for meg, det kan være så mye. Jeg tenker at IKT i mine fag innebærer å bruke PC og nettet aktivt som et verktøy til læring - man må være kritisk, trene på å søke etter informasjon som er relevant og troverdig, for så å kunne bruke den informasjonen videre i læringsarbeidet. Ofte er det noen få sterke elever som klarer å dra nytte av denne type oppgaver. Opplever at det krever et visst modningsnivå for å jobbe med internett eller ulike program på PC. Når alt kommer til alt så driver alle med dette og det er kanskje for mye fokus på denne delen av IKT og læring... Jeg foretrekker den gamle måten, men bruker den sjelden...

- ✓ bruker into Words ved skrivning
- ✓ clarify, british council, News in levels
- ✓ Bruke digitale hjelpemidler både i frontalundervisning og gjennom elevenes arbeidsprosesser
- ✓ Lytte, quizlet, forms, skriftlig m stavekontroll, digitale ordbøker, intowrds, grammatikkoppgaver m.m.
- ✓ Digitalbok, opplæring av tekster, omvendt undervisning samskriving, interaktive språkspill, aktiv lytting, quizlet, kahoot, digital ordbok, lingua planet mindomo tankekart, intowords, grammatikktraining British Council
- ✓ Videoer om vokabular via youtube. Se/lytte til engelsk i spisingen. Tavlebok.Svare på oppgaver digitalt.
- ✓ Bruke chromebook, smart tavle, skrive med skriveverktøy, lytte til tekster, ta opp når de leser.
- ✓ Bruk av IntoWords
Bruk av andre hjelpemidler som ordbøker, synonymordbøker, Bruk av spill
Bruk av youtube og andre videonettsider
- ✓ Bruke ferdige ressursider som er gratis tilgjengelig. Sanger fra youtube, bøker fra oxfordowl, starfall, ressurser fra forlag.
- ✓ Bruke elvnettsteder og interaktiv tavle . Se filmer. Bruke f.eks quizlet i gloseinnlæringen.
- ✓ I «undervise i engelsk gjennom IKT» legger jeg i at vi bruker ulike nettsteder til læring, bruker CB til skrivning og innlevering. Selv bruker jeg ulike nettsider til grammatikkoppgaver, eksempelvis har British Council fine undervisningsopplegg med tanke på uttale, vokabular etc. Vi kan bruke Kahoot eller andre nettressurser til å lære gloser, fakta. Vi kan bruke Audacity eller andre til lydopptak.
Youtube er fin til å visualisere og vise dokumentarer og severdigheter.
Også hjelperressurser legger jeg inn her eks Intowords, hvordan bruke internett og kildekritikk, online ordbøker etc.
- ✓ Quiz med umiddelbar tilbakemelding
Utforske språket ved å spille og lage egne spill. Skrivestøttende programmer. video/taleopptak
Talesyntese. Filmer
- ✓ Kahoot, Quizlet, Clarify og andre digitale ordbøker, IntoWords. Spesielt viktig for de med lese- og skrivevansker (f.eks. dysleksi).
- ✓ -
- ✓ Bruk av nettressurser, digitale portaler.
- ✓ Alle elver har Chorme book. Vi kan jobbe med samskriving og andre samarbeidsformer som gir bedre læring. Vi har også benyttet Oxford Owl der vi finner bøker som passer på forskjellige nivå. Disse kan både leses og de kan få de lest opp høyt. Vi benytter også Quizlet som de opplever som en motiverende måte å øve gloser på.
- ✓ Variere i bruk av læreverk som ligger digitalt tilgjengelige.
Bruke programmer og spill som er aldersadekvate.
Bruke digital kommunisering i forbindelse med lekser.
- ✓ Jeg hadde aldri brukt en slik setning - for vagt. Hva betyr 'IKT' og hva betyr 'gjennom'?
- ✓ Vi bruker nettbok, oppgaver på nett, elevene skriver hovedsakelig alt på Cromebook, Quizlet, Kahoot, etc
- ✓ Forskning, søk om nyhet, søk om skuespill
- ✓ Variasjon, uttale, inspirasjon , mangfold, sanger, tekstdifferanse, bilder, bøker,
- ✓ opplæring av tekster
rette program
korte filmer og oppgaver
- ✓ Glosetrening
Videoeksempler/film
Lyd/uttaletrening
Skrivetrening
Grammatikkinnlæring
Dialogtrening
Prosjektarbeid, Bl.a

- Bruke digitale hjelpemidler og nettsteder: lage digitale presentasjoner, se filmer på youtube (mmmEnglish, Lærer Ingrid) moava, enklifag, grammarly, live worksheet, oxford owl... Det er også enklere å gi tilbakemelding på skrevne ting digitalt.
- Presentasjoner. Grammatikk oppgaver. Tekst skriving. Ordbok
- Digitaliserte læreverk, apper screencastify, tekster, artikler ol. Grammatikk øvingsoppgaver på nett...
- bruke ipad, bruke digitale hjelpemidler,
- Bruke Chromebook til lærebokforlagets nettsider, med øvelser ift ulike emner. Bruke til å lage presentasjoner, lage lydopptak av egen lesing, bruke pedagogiske verktøy og apper som er tilgjengelige mm.
- .
- stairs online, quizlet, online dictionary, lytting, e-aviser,
- Bruk av Internett
Ulike apper. Samskriving
- Oppgaver via Ipad. For eksempel
- Film, Lydfiler, Skrive digitalt, Lydopptak av egen lesing og annet.
- - gjøre bruk av treningsprogram for å lære ordbankord.
- - lytte til tekster som man kan trene på for å forstå engelsk.
- - lese etter tekster for å lære å uttale engelsk.
- Det dekker ikke den verdifulle muntlige treningen som elevene får gjennom trening med læringspartnere i klasserommet.
- Se fagrelaterte videoer på nett, bruk av nettbrett i alle timer både av lærer og elever, søke og innhente relevant informasjon på nett, lære hvordan man kan redigere og omorganisere tekster man skriver i Pages, bruke ulike verktøy som å lage digitale bøker, iThoughts (tankekart), Explain everything (man kan lese inn, tegne og skrive), quizlet (et gloseøvelsesprogram der man også kan konkurrere i gloselæring med hverandre)...
- Skrive tekster, jobbe med fonetikk, lytteoppgaver
- iPad
- Bruk av nettsider, apper, produksjon av elevarbeider av ulike format på ipad, visualisering ved bruk av bilder sammen med tekst på ipad, opplesingsverktøy, nettoppgaver tilhørende bokverk (som dessverre er temmelig utdatert), talenotat av elevers høytlesing bl.a. lekser, google translate som hjelpemiddel når elevene står fast på betydning av ord, engelsk tastatur med ordliste, innlevering av lekser i Showbie.
- Flere av disse er til god hjelp for dyslektikere i elevgruppene.
- Hjelpemidler i form av apper som Showbie, BookCreator, Duolingo, Clarify, retteprogram i Pages osv
- * Lokus/Quest
- * ClassroomScreen
- * Arbeide i Chromebook
- Bruker engelske filmsnutter, musikkvideoer, sanger, oppgaver på læreverkets nettsider, oppgaver på andre nettsider, spill, online ordbok, lage ordbok selv på Ipad, omvendt undervisning, lese inn leselekse som talenotat på Ipad osv.
- Digitale læringsplattformer
Skrive på ipad
Høre engelske lydbøker
se engelske læringsfilmer
se og høre sanger og regler
lage digitale bøker
drille apper
bruke engelske kilder på internett
- Digitale lærebøker og oppgaver på nett.
Digitale ordbøker, nettkilder, «lytt og les».
Bruk av CB/Ipad.
Samskriving, produksjon av læringsfilmer etc.
- Bruker Ipad
Lager engelskbøker på Ipad
Engelske læresider på internet
- Motivasjon, lærelyst hos barna, flere muligheter, skapende, kreativt, i tiden!
- Bruk av ipad, smart book til å lese i, skriver tekster og oppgaver i Bookcreator, googler for å finne info, hører på lydfiler, tar opp egen lesing
- Undervisning fra min side skjer via nettbrett og elevene bruker nettbrettet til å løse oppgaver samt noe skriving
- Klassen min deltar i et eTwinning prosjekt med skoler i Italia og Portugal. Prosjektet går ut på å samskrive historier og å dele disse i vårt prosjektrum i eTwinning portalen. Slik får elevene

- oppleve at de kan kommunisere med andre på engelsk på en autentisk måte, og de lager fortellinger sammen. Flott for både elever og lærere.
- ✓ Vi bruker iPad i undervisningen. Her brukes både pages, keynote, internett og book-creator.
- ✓ Elevene leser inn tekst på iPad, for å lytte og forbedre etterpå.
De skriver på iPad med stavekontroll.
Bruk av digital ordbok.
Øvingsoppgaver i grammatikk på iPad.
Vi bruker Showbie til samling av ressurser og innleveringer.
- ✓ Bruke nettstedene til læreverkene.
Bruke engelskspråklige filmklipp, sanger, regler o.l
Lage «glosebok» digitalt med taleopptak og bilder.
Taleopptak av lekser.
Lærer legger ut taleopptak som rollemodell eller i samspill med elevene.
- ✓ Bruke nettbrett i ulike sammenhenger. jeg bruker explore smarttavle.
- ✓ Digital ordbok
Digitale språkressurser, for eksempel fra British Council
Søke info om temaene vi jobber med på nettet
Google språklige spørsmål
Ta notater elektronisk
Gode snutter på Youtube til temaene våre
Lage film etc
- ✓ Lage filmer.
Kunne søke opp ord og begreper som elevene ikke forstår.
Lage bøker.
Lage vlogg.
Nettsider som british council.
Grammatikk øvelser på nett.
Intervju av hverandre.
Radioprogram
- ✓ Ipad, Showbie, Skrivning i pages
mulighetene til å gi muntlig tilbakemelding som talenotat i Showbie
- ✓ Jeg har akkurat begynt som engelsklærer og prøver å finne min stil. På 4. trinn synes jeg det er viktig at elevene tør snakke og bli trygge på at det er helt akseptert å gjøre/ si feil.
Det er viktig med variasjon for å nå inn til flest mulig og jeg bruker bla ikt tavlebok og musikkinnlæring.
De gjør også oppgaver digitalt som er et fint supplement til arbeidsbok. Lenger har jeg ikke kommet i bruken av det digitale verktøyet, men kommer til å bruke det mer når jeg får opplæring.
Jeg må nevne min egen erfaring med å lære fransk (i Sveits). Jeg forsto alt som ble sagt til meg i flere måneder, men jeg rakk aldri å svare tilbake. Dette løsnet ved at jeg gikk på et kurs hvor en fikk spørsmål digitalt og fikk svare på det muntlig (høretelefon). Den type verktøy savner jeg til språkkinnlæring. Den finnes kanskje der ute?
- ✓ At undervisningen er heldigital, at bøker ikke brukes. Selv er IKT et supplement.
- ✓ Jeg tenker vidt, også at elever kan involveres ved å bruke nettsider. Men jeg tror det i denne undersøkelsen er lagt vekt på at ikt betyr at læreren er heldigital, og over hode ikke bruker bøker.
- ✓ Lydstøtte til leselekse
Digitale ordlister med lyd støtte
Lydopptak av egen lesing
Filmopptak av skuespill o.l
Søke på bilder og ord veldig raskt
Kan differensiere mer uten at medelevene vet det
Kan legge inn nye oppgaver fortløpende i en økt
Kan bruke mange verk parallellt
Lettere å lage egne oppgaver for både lærere og elever
- ✓ En- til- en iPad, skrivning med stavekontroll og digital ordbok, elevene er både konsumenter og helst produsenter på iPadene.
- ✓ Bruk av videoer, sanger, app'er, spill og nettsteder.
Bruk av nettbrett og Book Creator i arbeidet med å lage sine egen engelskbøker der de arbeider med å utvide ordforrådet sitt og lese inn talenotat.
- ✓ Helt vesentlig!
- ✓ Er iPad en ti en skole og benytter iPaden omtrent alle aktiviteter. Bruker det som finns av ressurser på nettet, men har en begrensning mht at mye esl ressurser krever Flash. Bli mindre lærebokavhengige.

- - Lage forskjellige videoer om tema
- - Vise forskjellige skilder fra internett
- iPad, Book Creator, Key Notes, Produksjon av tekst sammen med bilder, Innlesing av tekst
- Produksjon av filmer, lese og lytte til tekst, engelskspråklig tastatur
- Bruk av i Movie, booklet, Quizlet, Showbie, moviemaker
- Ipad
- Ressurser, vurderinger, innleveringer og tilbakemeldinger gjøres digitalt
- Skrive på iPad
- Smartbok
- Bruke apper som Book Creator aktivt, både der elevene kan lage egne bøker med ord, regler etc., og til konkrete oppgaver
- Digitalisere muntlige vurderingsuttrykk (kamera)
- Gi tilbake- og fremovermeldinger på elevenes tekstproduksjon via film
- Legge ut lenker til oppgaver med spesifikk språktrening
- Gi elever valgfrihet i kildebruk
- Bruker iPad - elever skriver stort sett på den, jobber med interaktive oppgaver, har digitalt læreverk. Mye bruk av filmer ifm ulike tema. kahoot brukt ift grammatikk og repetisjon.
- Elevene bruker CB for å lese, høre og skrive tekst. Beskjeder og instruksjon gis på Classroom. Elevene bruker Google Extensions for ordbok, retteprogram, presentasjoner mm. og jeg bruker det til retting og tilbakemelding til elevene.
- Smartbok, smart tavle, interaktive oppgaver på nett, mye skriftlig arbeid skrives på datamaskin og vurderes digitalt, innspillinger med lyd og bilde, bruk av padlet/quizlet/kahoot etc.
- Finne informasjon på nett og lære kildekritikk
- Vi bruker digitale lærebøker, vi bruker digitale ordbøker og vi bruker quizlet til glosetrening. Vi gjør også oppgaver til det digitale læreverkets, disse oppgavene er drag and drop pluss veldig mye mer. Vi bruker også filmsnutter fra YouTube og mange skriver på iPad, men jeg liker bedre at de skriver på PC, siden de skriver mer formelt riktig da.
- Bruke iPad som skriveredskap
- Bruke iPad til tankekart
- Bruke YouTube-videoer
- Gi tilbakemeldinger på lekser og annet på Showbie på iPad.
- Elevene gjør taleopptak av elevdiskusjoner (vurdering).
- Gi muntlige lekser - de leverer taleopptak.
- Lærer leser inn, elevene lytter og gjør taleopptak.
- Elevene lager video om et emne.
- Bruke digitale plattformer
- Elevmedvirkning gjennom bruk av Padlet
- Vokabularlæring gjennom Quizlet som verktøy
- Bruk av opptak ved muntlige presentasjoner/taler o.l.
- Bruk av PowerPoint, samskriving, kahoot, digitale ordbøker
- Keiserens nye klær.
- power point, online oppgaver, nettlæresteder
- Kildebruk
- Oppdatert kulturkunnskap
- Interaktive oppgaver
- Skjerm og dokumentdeling
- Samarbeid lærer/elev (tutoring, feedback, ekstra materiale for differensiering)
- Forelesninger
- Bruk av Quizlet, digitale ordbøker, leselekser på lydfil, samskriving i Læringspar, lenkesamlinger og oppgaver i Google classroom
- digitale delingsplattformer, nettressurser etc
- Billedgjøte faget
- flere måter å møte tema på
- Tilpasset undervisning
- Variasjon
- Bruke flere sanser, lese, lytte, se....
- Digitale hjelpemidler kan gjøre undervisningen morsommere og nyttig på mange måter, for eksempel når det kommer til å lære seg nye ord og uttrykk på engelsk. Det er mye lettere for elevene å bearbeide en tekst digitalt enn å skrive den på nytt på papir. Det går raskere å kommunisere med elevene via pc - og det er utrolig mange nettsider som kan hjelpe elever til å lære grammatikk, for eksempel. Ordbok på nett er også et veldig godt hjelpemiddel - du kan lytte til hvordan et ord skal uttales, du får ulike eksempler på bruk og du får synonymer (thesaurus).

Jeg underviser i samfunnsfaglig engelsk, og der er det helt naturlig å bruke ferske nyheter og ferske nyhetsartikler i undervisningen, hvor det er viktig å være oppdatert på hva som skjer akkurat nå i den engelskspråklige verden. Det blir aldeles merkelig å skulle bruke en lærebok som ble publisert for 6 år siden (eller mer) hvis temaet er politikk eller økonomiske og sosiale problemer i Storbritannia eller USA. Her er du nødt til å være oppdatert og vite hva som skjer nå. Det å bruke ulike kilder er nødvendig og viktig å lære elevene. Min erfaring er også at elever kan være flinke til å ignorere sosiale medier i arbeidssituasjoner - kanskje flinkere enn mange voksne. Mine elever bruker ofte samskrivingsdokumenter (f.eks. Google Docs) og leverer inn små filmsnutter med presentasjoner. Uten ikt ville dette ha blitt en helt annen læringssituasjon. Jeg oppfatter ikt som en stor hjelp for meg som lærer, selv om jeg selvfølgelig også bruker tavle-undervisning også.

- Bruk av PowerPoint, Quizlet og andre læringsapper, tekstredigering, elektroniske ordbok, stave- og grammatikkontroll, film og lyd, Internett som informasjonskilde
- Gloseappen Memrise
 - Skrive tekster og redigere dem i Word
 - Finne informasjon og lese nyheter på internett
 - Elevproduserte korte filmer eller podcasts/lydoptak der de kommuniserer på engelsk om ulike tema f. eks sport eller litteratur
- Forberede eleven på livet i den virkelige verden, vi er et digitalt samfunn. Kommer ikke unna det.
- Bliir mye spill dersom de får velge, og effekten er jeg usikker på!
- Mestring, kreativitet, løsningsorientert, læreglede, nysgjerrig, produktivitet, frihet
- online aviser, skype, ted talks, online materiell for grammatikk
- Bruker mye lytting på nett, for uttale. ordbøker, quizlet. News in Levels osv. Se film.
- Det finnes jo mange måter å benytte IKT på. F.eks. bytte ut, ved at man benytter skriveprogram på iPad i stedet for papir. Eller at man bruker helt andre programmer/apper for å lære. Savner mer apper som kan tilrettelegge mer for elevene i engelskopplæringen mtp tilpasset opplæring.
- vi bruker classroom som et verktøy, tekster scannes inn, linker legges ved, lydfiler han lyttes til, nye begreper/gloser kan lyttes til, powerpointpresentasjoner, grammatikk øves på digitalt, samskriving av dokumenter, øver på gloser digitalt
- Interaktiv tavleundervisning
 - Elevers Chromebooks
 - YouTube
 - Andre apper
- I tekstproduksjon bruker jeg utelukkende Word pga redigeringsmuligheter, stavekontroll ++ opplever dette som veldig nyttig.
- Bruke Google docs i skrivearbeid , interaktive læremidler, YouTube med oppgaver rundt tema, kortfilmer/ lydbøker, ulike gode IKT- sider med tekster/ grammatikk/ ordkunnskap , quizen osv
 - - digitale gloseprogrammer, f.eks. Quizlet
 - - digitale grammatikkoppgaver, f.eks. a4esl.org
 - - skrivning av lengre tekster digitalt
- Bruk av digitale verktøy og ressurser
- Er veldig nyttig noen ganger.
- Bruk av digitale verktøy
 - Kunne kommunisere på engelsk på ulike digitale plattformer
- Samskriving
- Hei,
 - Jeg underviser i engelsk gjennom IKT ved å benytte ulike websider for å nå læringsmål. Det være seg grammatikkoppgaver, filmsnutter, inspirasjon til ulike tema.
 - Jeg benytter også digitale læreverker + tilhørende nettsider.
- Høre, lese teksteruttale, forstå, moro, variere, øve gloser
- Smart tavle
 - Lyttetekster
 - gloseøving
- Som du la det frem så gjelder det også å skrive på PC - ha digitale læremidler, bruke NDLA, læringsvideoer på youtube, digitale aviser. Presentere multimodale tekster og audiovisuelle hjelpemidler som prezi, wix, powerpoint padlet osv. Vi bruker også kahoot og quizlet i oppsummering av arbeid på slutten av økter.
- Bruke:
 - Smart tavle, smartbok, egenvurdering/kameratvurdering/lærerkommentarer i Google Docs, nettressurser osv...

- Bruke datamaskinen/Chrome Book som hjelpemiddel, men ikke eneste læremiddel. Elevene har også lærebok og skrivebok. (Fortsatt lese, snakke/diskutere, skrive og lytte)
Skrive tekster på datamaskin (lett å gi feedback underveis)
Elevene kan lage delingsdokumenter(samskriving)
Bruke quizlet til å øve inn vokabular
Bruke datamaskin til å lage presentasjoner og for eksempel ta opp lyd og/eller filme ved bruk av f.eks Screencastify
Lage podcast
Ta opp andre samtaler/dialoger/dramatiseringer (lyd eller lyd med bilde)
Lytte til lydbok
Vise aktuelle filmsnutter fra Youtube, BBC mm
Vise aktuelle filmer knyttet til temaer vi jobber med
Kommunisere med elever
Elever kan kommunisere med elever i andre land (eks via felles Padlet)
(La elever levere i Classroom + kommunisere med elever der)
Gi hyppige tilbakemeldinger ved bruk av highlight tools (Google Classroom)
Legge ut scannede tekster, nyhetsartikler (lenker) og lydfiler i Classroom/ITL
Øve grammatikk (tester - ITL)
Bruke Kahoot
Bruke digitale ordbøker, into Words (la elevene lytte til egen tekst), Clarify mm
Grammarly
- Kombinere bilder og lyd, få inn korrekt og variert engelskuttale
- Bruker Chromebook i nesten alle timer, både at elevene jobber selv på den, eller at jeg bruker den til undervisning. Elevene har digital arbeidsbok. Alle oppgaver legges ut på Classroom, der legges også alt av kriterier, lenker, info etc. Noen ganger brukes også ITL, og vurderinger gis gjennom ITL.
Elevene skriver tekster, lager presentasjoner, filmer mm. i ulike digitale formater.
- Skriveøkter
Google
Storyline
- Se på film, you tube, kahoot, bruke pc for å skrive tekster, bruke digitale hjelpemiddel for utforskning. Medeleverdning
- tilpasset
fleksibel
muligheter
- Digital arbeidsbok
Innleveringer på Classroom
Bruk av YouTube
- Gyldendal smart øving
Gyldendal smart tavle
Stairs
- .
- Varierer undervisningen. Vi har bøker, og leser i disse, men tar tekstene inn i IKT, og bruker IKT for å finne ut mer, svare på, undersøke, bygge videre på tekstene i bøkene.
- - kahoot
- quizlet
- youtube
- Bruke digitale hjelpemidler til dramatisering.
Gjøre oppgaver på nett.
Øve på ord.
Lese inn lekse og levere på nett.
- høre uttale, ord, lyd mer deltagelse
- nettsted til lærebok
NDLA
- Quizlet
læreverkets nettsider (explore)
Google skjema
- Quizlet til å øve inn gloser
Setninger med bøyning av sterke verb i elektronisk dokument som hjemmelekse
Stairs Listen i tillegg til tekstbok til å øve på uttale.
- bruke digitale plattformer, nettsteder, film, youtube, apper etc
- Elevene får lest opp teksten de skal jobbe med.
Bruke ulike nettressurser til å variere undervisningen.
Lage PP som de bruker når de fremfører.

- Det er lettere å tilpasse slik at undervisningen blir mer dysleksivennlig.
- Jeg bruker Quizlet, Kahoot, Padlet, Youtube og diverse nettsteder jeg finner relevante for de temaene vi gjennomgår. Jeg bruker også interaktive grammatikkoppgaver, hvor elevene løser oppgavene på nett.
- Bruker nettbrett med apper som pages, bookcreator, explain everything, imovie og clips.
- I tillegg bruker vi en del british council sine sider med nivåtilpassede oppgaver. Bruker også gamestolearnenglish og oxfordowl for og få variasjon.
- I det siste har vi prøvd enkfag også (spill i engelskundervisningen).
- Inspilling av lyd og film
Bruker det også til vurdering
- Bruk av lydfiler som hører til leseleksa. Bruk av staveverktøy: «into Words». Bruk av Google dokumenter til skriving og grammatikk. Bruk av Quizlet til glose/begreps-innlæring.
- Alt som ikke involverer papirutgaver
- Alt digitalt. Lytte, skrive. smartøving.

Question 18, Can you write in short what you believe «teaching English with traditional teaching aids» entails?

- Det å skrive for hånd (viktig i fremmedspråk), bruke kun bok og papir.
- Lite interaktivitet
- Skrive ord på engelsk, og lese lese lese.
- Bruk av ferdige pedagogiske opplegg.
- bruke lærebok og workbok, skrive i arbeidsbok, lese høyt i klasse
- Lese bøker og andre trykksaker (særlig skjønnlitteratur)
- Tavle og tusj (mer aktiviserende og spennende enn ferdige power point - og prezi-presetasjoner - vi har ikke smartboards i vgs, så vi kombinerer vanlig tavle og prosjektor fra pc)
- Penn og papir som kognitive verktøy i arbeidet med å være skrivende mennesker
- Samtaler og gruppediskusjoner
- Litteratur f.eks
- - Lese tekst i lærebok
- - gjøre oppgaver i lærebok
- - tavleundervisning (f.eks grammatikk regler)
- mer læring, setter seg bedre/ elevene husker bedre det de skriver for hånd
- Lese tekster, gjøre oppgaver og skrive for hånd, samtale i klasse/læringspar
- Lærebok
- Bruk av lærebøker, øve på å skrive for hånd, lese papirbøker
- Bruke læreboka, skrive i kladde bok. Tradisjonell gloseprøve. Best i kombinasjon.
- Lærebok
- Skrivebok
- Gammeldagse tekster helt uinteressante for ungdommen.
- Har ingen kommentar
- bok, penn og papir
- Konsentrasjon
- Vi bruker fortsatt bøker til lesing, og innimellom skriver vi også på papir.
- Kopi ark, blyant og papir, bruker tekstbok side for side, avhenging av læreveileding
- Lærebok
- Oppgavebok
- Glosebok
- Skrivebok
- Perm til perm
- Lesing
- Oppgaver
- Bøker
- penn og blyant og kun læreboken som kilde
- Arbeide med lærebok og gjøre oppgaver som skrives i skriveboka.
- Skriver for hånd litt kreativ skriving av avsnitt for å trene på skriftlig engelsk. Bruker plastmappe som regelbok og til kopier og egne skriveoppgaver for å bruke som læring og støtte under skriveøkter.
- papirbok, snakke sammen, skrive i papirbok

- ✓ Kunne skrive uten hjelpemidler dersom nødvendig, kunne snakke fritt uten distraksjoner, ha diskusjoner, delta muntlig i timene etc.
- ✓ Leser fra bøker
 - Har en felles lærebok med progresjon og oppgaver i tilknytning og tilpasset (oppgavene kan også legges ut på iPad) de kan velge hvordan de vil jobbe
- ✓ Engelskverk, skrivevok. Bilder og pictogrammer
- ✓ Spill
 - Lærebok
- ✓ Bruke tekster fra læreverket, ikke-digital tavle, elevene jobber med blyant og papir.
- ✓ lite varierte metoder, lese høyt for hverandre, pugge gloser
- ✓ Selvstendighet
 - Ordforståelse
 - Skrivekompetanse
 - Uttale
 - Ferdigheter i grammatikk
- ✓ tenker hovedsaklig på læreboka og skriveboka. Vi bruker den også noe i undervisningen, men da ofte med oppgaver på iPad som supplement. (F.eks. les s. 33-34. Diskuter teksten med sidemannen, deretter i plenum. Lag en presentasjon der du forteller om temaet).
- ✓ - valige bøker
 - Skrive med penn og papir
 - ordbøker
 - tavleundervisning
- ✓ Lærebok, instruktivisme, lærerstyrt, lite praktisk
 - vet ikke helt, egentlig.. Bruker veldig mye ikt
- ✓ Bruke tekstbok (uten mulighet for å lytte på tekst hjemme ved øving). Alle oppgaver skrives i egen skrivebok. De fleste oppgavene er hentet fra workbook.
- ✓ Lærebok, skriving for hånd, utdelte ark. Jeg bruker også dette i kombinasjon med ikt. Jeg bruker også readers journal der de skriver "immediate" thoughts og refleksjoner rundt der de leser.
 - Men bruker veldig sjelden pen and paper- approach til grammatikk.
- ✓ Mener engelsk må inn i alle fag hver dag. Noen drypp med engelsk instruksjonen fra lærer er nyttig!
- ✓ Bruke papirbøker, skrive i notatbøker, slå opp i papirordbøker.
- ✓ Bøker, skrive i bøker, vanlig tavleundervisning. Følge en lærebok fra perm til perm
- ✓ Ulike formingsaktiviteter til temaer
 - Bruke skrivestartere til egne tekster på papir
 - Spørsmål til tekst
 - Grammatikkoppgaver
 - Lettlestbøker
 - Guided reading
- ✓ Bruke fysisk bok
- ✓ Bruke læreverk.

Jeg bruker regelbok hvor elevene må skrive med blyant og systematisere grammatikk med farger/uthevinger osv.

Jeg tror det er viktig å også skrive engelsk med blyant/papir- spesielt enkelte elever har behov for denne læringsformen for å lære stoffet godt.

- ✓ Bruk av tekstbok og ark/arbeidsbok
 - Synge sanger
 - Muntlig pararbeid/gruppearbeid etter muntlig instruksjon
 - veiledet lesing
 - lytte til tekster for å løse oppgaver muntlig eller skriftlig
- ✓ lærebøker
 - oppgaveløsning
 - læringsstrategier (lese, skrive)
- ✓ Penn og papir, lese og gjennomgå ting fra boka.
- ✓ Da mener jeg å lese, snakke og å lytte. Det å skrive for hånd i bøkene sine og å tegne. Vi snakker mye, de repeterer etter meg, vi leser sammen og vi synger. Alt er viktig.
- ✓ .
- ✓ Lese tekster på papir
 - Bruke tavla
- ✓ Lese tekster i lærebok, skrive oppgaver og gloser i arbeidsbok.

- ✓ Bruke boka.
- ✓ Skrive i skrivebok.
- ✓ Jobbe med å skrive riktig både ord , setningsoppbygning. Lese lenger tekster og bøker.
- ✓ Lærebok
- ✓ Skrive ned gloser i glosebok.
- ✓ Bruke penn og papir ved tekstskaiping.
- ✓ Bruke ordbøker og læreverk.
- ✓ Muntlig trening gjennom lek og skuespill.
- ✓ Åpne boka, lese side 37, svare på oppgavene som er der
- ✓ Muntlige øvelser, arbeidsark, sang, og bruk av Smartboard og ressurser som finnes på internett.
- ✓ Se over.
- ✓ - bruke tekstboka
- ✓ - lese tekster
- ✓ - oversette
- ✓ - svare på oppgaver
- ✓ - gjøre oppgaver i arbeidsboka
- ✓ For meg betyr det å bruke lesebok og work book, fylle inn ord i oppgaver, pugge gloser og ha jevnlige prøver. Gjennomgå leselekse og oversette.

Kanskje med unntak av det første året jeg jobbet som lærer, så har jeg aldri jobbet kun på den måten. Har mest undervist på 1.-4. trinn og har alltid hatt fokus på muntlige aktiviteter i form små sketsjer, ordleker, spill osv. Bruk av dyr og fingerdukker som utgangspunkt for samtaler mellom personer og dyr m.m.

Men... jeg har også ALLTID vært nøye med lesing og oversetting, at vi gjennomgår og lærer oss innholdet i hovedsak, men uten å pugge løse gloser.

- ✓ Forelesning - på tavle eller med Power point
- ✓ Literatur - jobbe med ulike skjønnliterære tekster, lese, analysere, skrive
- ✓ Lese i lærebok e.l- + gjøre oppgaver til teksten
- ✓ Notere - bruke tankekart eller andre notateteknikker til å jobbe med det som leses eller presenteres
- ✓ Prosjekter - samarbeide
- ✓ Snakke - muntlige oppgaver, i gruppe eller individuelt
- ✓ Lytte til, se på - snutter, filmer, musikk
- ✓ Leser en del litteratur med elevene
- ✓ text book, work book
- ✓ Bla opp på s. 127, les teksten og gjør oppgavene på s. 128
- ✓ Lese, skriftlig, grammatikk, film
- ✓ lesebok
- ✓ engelsk arbeidsbok
- ✓ lettleste papirbøker/bibliotek, ordbokoppslag, brettspill, dialogspill, kortspill
- ✓ Lesebøker, Arbeidsbøker, Skrive oppgaver for hånd.
- ✓ Lese høyt fra bøkene, lytte til læreren, lese og skrive i bøker .
- ✓ Bøker, skrivesaker, arbeidskar, penn, Høytlesning, Grammatisk regelbok
- ✓ Lærebøker, stensiler,
- ✓ Lese på papir. Bruke flashcards. Håndskrift.
- ✓ I å «undervise i engelsk gjennom tradisjonelle læremidler» legger jeg i at man bruker læreboken mer aktivt. Elevene jobber med tekstene der og gjør notater i kladdebøkene sine. De har kanskje også en kladdebok til grammatikk og en til å skrive ned gloser.
- ✓ Likevel legger jeg også i at man bruker nettsressursen til læreboken slik at de kan få tekstene opplest og andre oppgaver til enn de som står i boken.
- ✓ Jeg legger også i at tavlen blir mer brukt.
- ✓ Bøker, lese, skrive, gloseprøver på papir
- ✓ lærebøker, lesebøker fra biblioteket, tavleundervisning
- ✓ -
- ✓ Finne materiell fra ulike kilder for å tilpasse til tema
- ✓ Lese i leseboka uten mulighet for å høre teksten bli opplest, jobbe i workbook, skrive hver for seg (ikke samskrive).
- ✓ Fysiske bøker både i forhold til lesing og skriving gir en type motorisk trening som jeg mener er viktig å ivareta og som kan virke forsterkende i noen tilfeller.
- ✓ Jeg hadde aldri brukt en slik setning. Tradisjonelle læremidler? Dagens vanlige lærebøker er integrert med nettbasert, interaktive verktøy og skiller seg fra tidligere lærebøker på mange

- måter. Er overhead et tradisjonelt læremiddel? I så fall er det å vise et bilde via videokanon 'tradisjonel', siden det er det samme for eleven som ser på?
- ✓ Lese bøker. Skrive for hånd, nyere forskning sier at en lærer bedre ved å skrive for hånd enn å skrive på en pc
 - ✓ Les en bok
 - ✓ lese tekster, svare på spørsmål, forme setninger, skrive, grammatikk,
 - ✓ flash cards, conversation, rollespill og lek
 - ✓ Lærebok med skriftlige og muntlige øvelser- temabasert.
Rollespill, dialoger, o.l
 - ✓ Oppgaver på kopierte ark
SKrive i kladdebok
 - ✓ Lesing og skriving for hånd
 - ✓ Lærebok...
 - ✓ bøker, skriving for hånd
 - ✓ Være mer bundet av lærebokens progresjon, heller enn å la læreplanen i faget bestemme tema og passende læremidler.
For læreren er det ofte mindre tidkrevende å bruke læreboken enn å skulle «hoste opp» nytt og spennende opplegg som innbefatter IKT.
 - ✓ .
 - ✓ lærebok, glosebok, skrive i skrivebok, rollespill, muntlig aktivitet
 - ✓ Lese litteratur
Tradisjonelle oppgaver til tekst.
 - ✓ Penn og papir og lærebok
 - ✓ Textbook- Workbook- Skrivebok
 - ✓ - følge læreboken med de mange og varierte tilnærmingene som den også gir.
 - ✓ Leser tekster og gjør oppgaver fra læreboka, lytter til lydfiler (kan kanskje også regnes som digitalt? Fil ofte hentet fra CD...)
 - ✓ Samtaler, gloseprøver, lesing av bøker
 - ✓ Skrive for hånd.
 - ✓ Bruk av lærebøker, både tekstbook og workbook.
Glosebøker der elevene skriver for hånd.
Skrivebok som arbeidsbok.
Ulike flashcards og terninger til samtaler eller skriveoppgaver, spill, konkrete, kopierte oppgaver på ark, film, musikk/sang, dialog og samtale i klasserommet - og utenfor, andre engelske bøker, både lærebøker og romaner/faglitteratur for barn.
 - ✓ Lærebok, tavle, penn og papir
 - ✓ Lese- og arbeidsoppgaver i bok
Høytlesing i klassen
 - ✓ Bruke lærebok, kladdebok, tavle, engelske spill, dramatisering og leker.
 - ✓ lærerbøker (Quest, Stairs) lesing og oppgaver. Skrive på papir, hentediktat
 - ✓ Fysiske lærebøker, andre skriftlige kilder. Skriving med penn og papir.
 - ✓ Engelsk lesebok
Skrivebok/arbeidsbok elevene skriver i
 - ✓ Læreverk som ikke følger tiden. Ensidig. Elevene får mindre mulighet til å være skapende.
 - ✓ Lærerbøker og skriftlige oppgaver i skrivebøker
 - ✓ MYE muntlig aktivitet. Elevene skriver i egen grammatikkbok samt skrivebok
 - ✓ Hele trinnet leser "Harry Potter and the Philosopher's Stone" sammen. Elevene har hver sin bok (klasesett) og følger teksten, samtidig som vi lytter til opplesningen av boken. Slik får vi en felles forståelse, øver på lesing og lesestrategier, og lærer stadig nye ord og uttrykk. Flott dette også for både elever og lærere.
 - ✓ Noen ganger bruker vi penn og papir, hovedsakelig hvis det skal lages postere, men også hvis elevene selv vil skrive i kladdebok.
 - ✓ Vi bruker av og til lærebok som utgangspunkt for tema, leser noen tekster og øver gloser og gjør oppgaver til tekstene.
 - ✓ Lærebok. Glosebok. Leker og aktiviteter. Øve på samtaler muntlig
 - ✓ Bruke tekstbok og skrivebok.
 - ✓ Læreboka, Tavle
Penn og papir-oppgaver
 - ✓ Lese og oversette tekster i læreboka, og jobbe med tilhørende gloser.
Drilloppgaver i grammatikk.
 - ✓ Lærerbøker som er 'pensum'
Skriftlig arbeid gjøres med penn og pair
 - ✓ Det er vel den måten jeg måtte lære språk på.....

- Det er feks. lese et stykke høyt i klassen eller for seg selv, svare muntlig eller skriftlig. Pugge gloser og bli testet på det i etterkant. Lære grammatikk uten å nødvendigvis forstå hvordan den kan anvendes. Alle gjør det samme samtidig, mao ikke tilpasset nivå til den enkelte.
- At skriftlige tekster hentes fra læreboka eller andre kilder, og presenteres stort sett på papir
 - Da bruker jeg læreboka eller andre engelske tekster, I tillegg er det sanger, men vi har gått over fra CD til nettbaserte lydfiler, så da er ikke det så tradisjonelt likevel.
 - Textbook, workbook. Notebook og glosebok
 - Slik jeg gjorde det for 20 år siden, med lærebok, tradisjonelle ordbøker og skrijving for hånd.
 - Tavle, kladdebøker/arbeidsark/blyant og papir.
 - Boken er viktig!
 - Ved å bruke vanlige læreverk, textbook og workbook.
 - Ingen
 - Ha tavleundervisning med grammatikk
 - Bruke workbook og skrive svarene for hånd
 - lese bøker, skjønnlitteratur
 - Pugge uregelrette verb
 - Følge opplaget til en lærebok (hvilket jeg IKKE gjør)
 - Lærebok, skrive i Reading journal
 - Engangsbøjer
 - Penn og papir. Lærebøker. Ulike spill som alias.
 - Øve på rettskriving og planlegging av tekst
 - Klassiske litterære verker
 - Mindre rom for kildebruk og utarbeidelse av kildebevissthet
 - Ro gjennom taktil bokopplevelse
 - Elever må skrive med penn på papir, lærebok som man blar i, stort set bruk av tavle/ evt powerpoint.
 - Lærebok, eller annen materiell som er trykket på papir. Elever skriver for hånd på et ark eller i skrivebøkene sine.
 - Tradisjonell skrive- og lærebok, plakater, oppgaveark og kopier på ark, skriftlig arbeid med blyant/penn
 - Lese tekster fra vanlig bok, ulempen med dette er at bøkene blir så utdaterte at vi må finne annet stoff uansett. Vanlig oppgaver med blyant og papir, dette er også bra,
 - Lekse i lærebok.
 - Svare på oppgaver. Skrive i skrivebøker for hånd.
 - Lese bøker, Lese noveller. Lage tankekart på papir. Skape struktur i tanker/temaer
 - Bruk av lærebøker, Word til skrijving, lesing av tekst i bok eller på skjerm
 - Eneste som fungerer
 - bok, papir, skrive for hånd. «lese» med penn
 - Læreboktekster spes i litteratur
 - Notatteknikk
 - Tavleforelesninger
 - lese tekster fra papirutgaven av læreverket, elevens individuelle phrase books
 - et mer «lukket» klasserom
 - Forskning viser til at ved å skrive på tradisjonell måte er en viktig læringsverktøy. F. Eks å lære gloser
 - Du har en lærebok hvor «pensum» står. Elevene jobber med oppgaver knyttet til tekstene i læreboken. Dette kan fungere helt greit om du skal undervise dikt, noveller og diverse korte tekster - for disse tekstene er jo de samme hele tiden. Du slipper også å bli fristet av sosiale medier som stadig vekk krever din oppmerksomhet. Det er muligens noe enklere å holde på oppmerksomheten til elevene.
 - Dette med å skulle lære seg å beherske et nytt språk innebærer alltid masse jobb, og du må investere energi i å lese og skrive mye for å bli flink. Bruk av ikt fjerner ikke behovet for innsats. Noen elever vil kanskje mene at det er enklere å forholde seg til et pensum som er i en lærebok enn å måtte lese diverse artikler på nett. Desto eldre elevene er, desto viktigere tenker jeg det er at de må lære seg til å klare å forholde seg til det mangfoldet som man må orientere seg i på nettet. Hvilke artikler er til å stole på, hvilke aviser og tidsskrifter har god nok kvalitet til at jeg skal bruke tid på det som legges ut? Mine elever skal studere på høyskoler og universiteter til neste år, og hvis jeg utelukkende hadde brukt tradisjonelle læremidler, tror jeg de ville være nokså hjelpeløse i sin nye hverdag som studenter.
 - Kommunisere, diskutere, drøfte, lese, skrive for hånd, lese høyt (lærer/elever), bruke språket aktivt i klasserommet, snakke «live», ta i bruk tradisjonelle «puggeverktøy» som glosebok, glosekort osv, bruke papir-ordbok (trener opp flere ferdigheter og gir bredere utvalg/mer presise forklaringer enn elektroniske ordbøker), bruke tavla som aktivt og fleksibelt verktøy for å utvikle ideer, forklare, lage tankekart osv.

Dybdelæring.

Samlet sett mer ro og fokus og mindre distraksjon enn gjennom elektroniske hjelpemidler.

- ✓ Samtaler og rollespill i par, grupper og klasse
- ✓ Lese tekster og gjøre oppgaver i læreboka
- ✓ Lese og kommunisere om romaner og filmer
- ✓ Presentasjoner elever/foredrag lærer
- ✓ Skrive gloser på tavla og øve på dem sammen

- ✓ Eldre lærere som kanskje følger boken mer slavisk. Notatbøker, skrive for hånd og bruke lærebøker til alt.
- ✓ romaner, tavle, skriving for hånd
- ✓ Skrive for hånd med oppslagsverk for ordbok.
- ✓ Det er viktig for å elevene å tenke igjennom staving og plassering av ord i setninger, noe de må gjøre mer enn når et retteprogram tenker for dem.
- ✓ bøker,
- ✓ Jeg tenker bøker, men det fikk vi ikke - så mye kopiark
- ✓ Gjentagelse og repetere etter lærer
- ✓ Vanlige lærebøker med work book til
- ✓ - jobbe med tekster på papir (ark + lærebok)
- ✓ - skrive gloser for hånd (i tillegg til å jobbe med dem på Quizlet)
- ✓ - kladding + skriving av småtekster i skrivebok (for hånd)
- ✓ Textbook, workbook
- ✓ Kjedelig
- ✓ Tavleundervisning
- ✓ Penn og papir med
- ✓ Fysiske lærebøker, skrivebok.
- ✓ Lese tekster, skrive i en bok, kunne lett finne frem og bla. Gøy med bok for å variere.
- ✓ Utfyllingsbøker
- ✓ Det er å bruke læreboka og skrive for hånd i en notatbok. Dette burde en gjøre mer -god form for læring.
- ✓ Bruk av blyant, skrivebok og lærebok. Lesing og skriving
- ✓ Lese, snakke, skrive, lytte
- ✓ Lese litteratur, romaner og bruke lærebok + kopier av eksterne tekster
- ✓ Svare på spørsmål til tekster i lærebok etc
- ✓ Gjøre andre muntlige og skriftlige oppgaver som står i lærebok
- ✓ Løse grammatikkoppgaver i læreboka
- ✓ Bruke CD/lydopptak av tekster i læreboka'
- ✓ Fremføringer foran klassen
- ✓ Dramatiseringer i gruppe
- ✓ Øve inn gloser mm
- ✓ Innleveringer
- ✓ Skrive, lese, se på bilder, snakke med andre elever, gjøre ting med kroppen
- ✓ Tavleundervisning der de skriver i boka.
- ✓ Lesing av tekster i læreboka, svare på spørsmål.
- ✓ Bøker
- ✓ Skrive for hånd
- ✓ Tankekart på papir
- ✓ Bruke pensumboka aktivt, bruke penn og papir. Lese bøker.
- ✓ tidskrevende
- ✓ umotiverende
- ✓ strukturert
- ✓ Bruke bok
- ✓ Tavleundervisning
- ✓ leseoppgaver, skriveoppgaver fra Gyldendal, Stairs, etc.
- ✓ -
- ✓ Noen elever liker best å skrive for hånd, f.eks. Det synes jeg er helt ok. Enkelte arbeidsark er fine å ha når vi jobber med grammatikk, og bruker repetisjons- og utfyllingsoppgaver.
- ✓ - kommunikasjon
- ✓ - lese bøker
- ✓ - tavleundervisning
- ✓ Bruk av lesebok, oppgavebok og glosebok.
- ✓ øye - hånd
- ✓ lærebok (papirutgave)

- Læreverk
- skrivebok
- kryssord o.l. påark
- Lese tekster fra tekstbok
- Gjøre oppgaver i skrivebok
- skriving på mange måter
- Lese tekst - svare på spørsmål
- beskrive bilder - skrive tekst til.
- mye pugg og statisk læring
- Skrive på tavlen, lese høyt fra læreboken, skrive gloser og gjøre oppgaver for hånd.
- Lærebok, penn og papir, men også spill uten digitale læremidler. Dette kan være ting som hot seat og guess who.
- Bok
- Tekster fra læreboka og oppgaver i arbeidsboka som hører til. Felles/individuell høytlesing.
- Læreboken, tavleundervisning, skrive essay på papir osv.
- Bokbasert læring. Samtaler mellom elevene, praktiske gruppearbeider. Lese for hverandre oversette.
- Glosetrening med quizlet
- Samarbeid gjennom quizlet live
- Skriving i skyen er meir motiverande enn skriving i bok
- Skriving i skyen gjer det lettare å samskrive

Appendix 4. The calculations of statistical significance

This Appendix shows an overview of the calculations of statistical significance using the StatPac calculator for a two-sample t-test, between percentages. First the data from [figure 5](#) is calculated in relation to age, education and teaching level followed by the data from [figure 6](#), also calculated using the same variables. The tests show whether there are significant differences between the two response groups. The C and D municipalities percentages and sample size is put in the first two boxes of every test, the control groups percentages and sample size follows in the third and fourth box. This way it is possible to read from the test which group has for instance the most ICT usage, or see the best effect of ICT. The two tailed probability shown in the last sentence at the bottom of the calculation is the equivalent of the p-level. Whenever the two tailed probability is 0, 05 or less the test shows significance. If the two tailed probability number is higher than 0, 05 there is no significant findings. The tests with calculated significance have a star in the heading.

Figure A: Age, under 40 years: ★

Enter the first percent:	<input type="text" value="81"/>
Enter the sample size for the first percent:	<input type="text" value="67"/>
Enter the second percent:	<input type="text" value="65"/>
Enter the sample size for the second percent:	<input type="text" value="57"/>
t-statistic = 2,015	<input type="button" value="Calculate"/>
Degrees of freedom = 122	<input type="button" value="Clear"/>
Two-tailed probability = ,0461	<input type="button" value="Exit"/>
	<input type="button" value="Help"/>

The t-statistic in this calculation was significant at the 0.05 critical alpha level, $t(2,015)=122$, $p= .0461$. Therefore, I reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding age under 40 years, was significant.

Figure B: Age, 40 years and older:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="65"/>
Enter the sample size for the first percent:	<input type="text" value="120"/>
Enter the second percent:	<input type="text" value="73"/>
Enter the sample size for the second percent:	<input type="text" value="81"/>
<hr/>	
t-statistic = 1,195	<input type="button" value="Calculate"/>
Degrees of freedom = 199	<input type="button" value="Clear"/>
Two-tailed probability = .2336	<input type="button" value="Exit"/>
	<input type="button" value="Help"/>

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(1,195)=199$ $p= .2336$. Therefore, I fail to reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding age 40 years and older and main use of ICT in teaching was not significant.

Figure C: Education, teachers:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="66"/>
Enter the sample size for the first percent:	<input type="text" value="38"/>
Enter the second percent:	<input type="text" value="61"/>
Enter the sample size for the second percent:	<input type="text" value="26"/>
<hr/>	
t-statistic = 0,409	<input type="button" value="Calculate"/>
Degrees of freedom = 62	<input type="button" value="Clear"/>
Two-tailed probability = .6838	<input type="button" value="Exit"/>
	<input type="button" value="Help"/>

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(0,409)=62$ $p= .6838$. Therefore, I fail to reject the null hypothesis and conclude that the

difference between the C and D municipalities and the control group regarding education of teachers and main use of ICT in teaching, was not significant.

Figure D: Education teachers with additional training:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="71"/>
Enter the sample size for the first percent:	<input type="text" value="86"/>
Enter the second percent:	<input type="text" value="72"/>
Enter the sample size for the second percent:	<input type="text" value="86"/>
t-statistic = 0,145	<input type="button" value="Calculate"/>
Degrees of freedom = 170	<input type="button" value="Clear"/>
Two-tailed probability = ,8847	<input type="button" value="Exit"/>
	<input type="button" value="Help"/>

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(0.145)=170$ $p= .8847$. Therefore, I fail to reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding education of teachers with additional training and main use of ICT in teaching, was not significant.

Figure E: Education, lecturers or lecturers with additional training:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="71"/>
Enter the sample size for the first percent:	<input type="text" value="56"/>
Enter the second percent:	<input type="text" value="69"/>
Enter the sample size for the second percent:	<input type="text" value="26"/>
<hr/>	
t-statistic = 0,185	<input type="button" value="Calculate"/>
Degrees of freedom = 80	<input type="button" value="Clear"/>
Two-tailed probability = .8540	<input type="button" value="Exit"/>
	<input type="button" value="Help"/>

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(0.185)=80$ $p= .8540$. Therefore, I fail to reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding education of lecturer or lecturer with additional training and main use of ICT in teaching, was not significant.

Figure F: Teaching level, primary school:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="68"/>
Enter the sample size for the first percent:	<input type="text" value="104"/>
Enter the second percent:	<input type="text" value="59"/>
Enter the sample size for the second percent:	<input type="text" value="72"/>
<hr/>	
t-statistic = 1,225	<input type="button" value="Calculate"/>
Degrees of freedom = 174	<input type="button" value="Clear"/>
Two-tailed probability = .2221	<input type="button" value="Exit"/>
	<input type="button" value="Help"/>

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(1,225)=174$ $p= .2221$. Therefore, I fail to reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding teaching level primary school and main use of ICT in teaching, was not significant.

Figure G: Teaching level, secondary and upper secondary school:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="74"/>
Enter the sample size for the first percent:	<input type="text" value="83"/>
Enter the second percent:	<input type="text" value="81"/>
Enter the sample size for the second percent:	<input type="text" value="66"/>
t-statistic = 1,010 <input type="button" value="Calculate"/>	
Degrees of freedom = 147 <input type="button" value="Clear"/>	
Two-tailed probability = .3141 <input type="button" value="Exit"/>	
<input type="button" value="Help"/>	

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(1,010)=147$ $p= .3141$. Therefore, I fail to reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding teaching level secondary and upper secondary school and main use of ICT in teaching, was not significant.

Figure 6. The perceived high effect of ICT in teaching:

Figure H: Age, under 40 years: ★

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="44"/>
Enter the sample size for the first percent:	<input type="text" value="67"/>
Enter the second percent:	<input type="text" value="62"/>
Enter the sample size for the second percent:	<input type="text" value="57"/>
t-statistic = 2,000 <input type="button" value="Calculate"/>	
Degrees of freedom = 122 <input type="button" value="Clear"/>	
Two-tailed probability = .0477 <input type="button" value="Exit"/>	
<input type="button" value="Help"/>	

The t-statistic in this calculation was significant at the 0.05 critical alpha level, $t(2,000)=122$, $p= .0477$. Therefore, I reject the null hypothesis and conclude that the difference between the

C and D municipalities and the control group regarding age under 40 years and perceived effect of ICT in teaching, was significant.

Figure I: Age 40 years and older:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="66"/>
Enter the sample size for the first percent:	<input type="text" value="120"/>
Enter the second percent:	<input type="text" value="63"/>
Enter the sample size for the second percent:	<input type="text" value="81"/>
<hr/>	
t-statistic = 0.437	<input type="button" value="Calculate"/>
Degrees of freedom = 199	<input type="button" value="Clear"/>
Two-tailed probability = .6627	<input type="button" value="Exit"/>
	<input type="button" value="Help"/>

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(0,437)=199, p= .6627$. Therefore, I fail to reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding age 40 years and older and perceived effect of ICT in teaching, was not significant.

Figure J: Education, teachers:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="56"/>
Enter the sample size for the first percent:	<input type="text" value="38"/>
Enter the second percent:	<input type="text" value="61"/>
Enter the sample size for the second percent:	<input type="text" value="26"/>
<p>t-statistic = 0,398</p> <p>Degrees of freedom = 62</p> <p>Two-tailed probability = ,6919</p>	
<input type="button" value="Calculate"/>	
<input type="button" value="Clear"/>	
<input type="button" value="Exit"/>	
<input type="button" value="Help"/>	

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(0,398)=62$ $p= .6919$. Therefore, I fail to reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding education of teachers and the perceived effect of ICT was not significant.

Figure K: Education, teachers with additional training:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="61"/>
Enter the sample size for the first percent:	<input type="text" value="86"/>
Enter the second percent:	<input type="text" value="62"/>
Enter the sample size for the second percent:	<input type="text" value="86"/>
<p>t-statistic = 0,135</p> <p>Degrees of freedom = 170</p> <p>Two-tailed probability = ,8930</p>	
<input type="button" value="Calculate"/>	
<input type="button" value="Clear"/>	
<input type="button" value="Exit"/>	
<input type="button" value="Help"/>	

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(0,135)=170$ $p= .8930$. Therefore, I fail to reject the null hypothesis and conclude that the

difference between the C and D municipalities and the control group regarding education of teachers with additional training and the perceived effect of ICT, was not significant.

Figure L: Education, lecturers and lecturers with additional training:

Two sample t-test between percents

Enter the first percent:	<input style="width: 60px;" type="text" value="57"/>
Enter the sample size for the first percent:	<input style="width: 60px;" type="text" value="56"/>
Enter the second percent:	<input style="width: 60px;" type="text" value="65"/>
Enter the sample size for the second percent:	<input style="width: 60px;" type="text" value="26"/>

t-statistic = 0,687	<input style="width: 60px;" type="button" value="Calculate"/>
Degrees of freedom = 80	<input style="width: 60px;" type="button" value="Clear"/>
Two-tailed probability = .4942	<input style="width: 60px;" type="button" value="Exit"/>
	<input style="width: 60px;" type="button" value="Help"/>

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(0,687)=80$ $p= .4942$. Therefore, I fail to reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding education of lecturers and lecturers with additional training and the perceived high effect of ICT, was not significant.

Figure M: Teaching level, primary school:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="67"/>
Enter the sample size for the first percent:	<input type="text" value="104"/>
Enter the second percent:	<input type="text" value="64"/>
Enter the sample size for the second percent:	<input type="text" value="72"/>
<hr/>	
t-statistic = 0,412	<input type="button" value="Calculate"/>
Degrees of freedom = 174	<input type="button" value="Clear"/>
Two-tailed probability = ,6805	<input type="button" value="Exit"/>
	<input type="button" value="Help"/>

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(0,412)=174$ $p= .6805$. Therefore, I fail to reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding teaching level primary school and the perceived high effect of ICT, was not significant.

Figure N: Teaching levels, secondary and upper secondary school:

Two sample t-test between percents	
Enter the first percent:	<input type="text" value="47"/>
Enter the sample size for the first percent:	<input type="text" value="83"/>
Enter the second percent:	<input type="text" value="60"/>
Enter the sample size for the second percent:	<input type="text" value="66"/>
<hr/>	
t-statistic = 1,579	<input type="button" value="Calculate"/>
Degrees of freedom = 147	<input type="button" value="Clear"/>
Two-tailed probability = ,1165	<input type="button" value="Exit"/>
	<input type="button" value="Help"/>

The t-statistic in this calculation was not significant at the 0.05 critical alpha level, $t(1,579)=147$, $p= .1165$. Therefore, I fail to reject the null hypothesis and conclude that the difference between the C and D municipalities and the control group regarding teaching levels

secondary and upper secondary school and perceived high effect of ICT in teaching, was not significant.