



Høgskulen på Vestlandet

Engelsk 3, emne 4 - Masteroppgave

MGUEN550-O-2023-VÅR2-FLOWassign

Predefinert informasjon

Startdato:	02-05-2023 09:00 CEST	Termin:	2023 VÅR2
Sluttdato:	15-05-2023 14:00 CEST	Vurderingsform:	Norsk 6-trinns skala (A-F)
Eksamensform:	Masteroppgave		
Flowkode:	203 MGUEN550 1 O 2023 VÅR2		
Intern sensor:	(Anonymisert)		

Deltaker

Kandidatnr.:	211
---------------------	-----

Informasjon fra deltaker

Antall ord *:	26200
----------------------	-------

Egenerklæring *: Ja

Jeg bekrefter at jeg har Ja registrert oppgavetittelen på norsk og engelsk i StudentWeb og vet at denne vil stå på vitnemålet mitt *:

Jeg godkjenner autalen om publisering av masteroppgaven min *

Ja

Er masteroppgaven skrevet som del av et større forskningsprosjekt ved HVL? *

Nei

Er masteroppgaven skrevet ved bedrift/uirksomhet i næringsliv eller offentlig sektor? *

Nei



Høgskulen
på Vestlandet

Master Thesis

Developing a Multimodal Learning Environment:

Can this be done with today's digital tools?

Utvikle et multimodalt læringsmiljø: Kan dette
gjøres med dagens digitale verktøy?

Torbjørn Sundal Aandahl – Kandidat 211

Teacher Education and Training 5-10 - English

Faculty of Education, Arts and Sports

Supervisor: Hege Emma Rimmereide

15.05.2023

Jeg bekrefter at arbeidet er selvstendig utarbeidet, og at referanser/kildehenvisninger til alle kilder som er brukt i arbeidet er oppgitt, jf. Forskrift om studium og eksamen ved Høgskulen på Vestlandet, § 12-1.

Preface

This master's thesis marks the end of a five-year education at the Western University of Applied Sciences. These years have been exciting and educational, and what has been learned over these five years is now being written down as a master's thesis. Creating this master's thesis would not have been possible without the help of the people around me, whom I need to thank.

I want to thank my supervisor Hege Emma Rimmereide for the fantastic help through the entire process of creating this master's thesis. The constant positivity and warm attitude have been much appreciated. The feedback, challenges and support were necessary and valuable to improve my educational writing and skills further. The support was sublime through both the positive, but also the difficult times.

I would also like to thank my friends and family for their support throughout this master's thesis process. Their support has been a constant push, in both the good times and the hard times throughout the year and to be able to finish.

Torbjørn Sundal Aandahl

Bergen, May 2023

Table of Content

Preface	i
Table of Content.....	ii
List of figures and tables	v
1.0 Introduction	1
1.1 Why I chose this topic.....	3
1.2 Research question.....	4
1.3 The thesis structure	4
2.0 Theory and Background	5
2.1 Digital Literacy	5
2.1.1 What is literacy?	6
2.1.2 From computer to digital literacy.	7
2.2 Teachers' professional digital skills	9
2.3 Multimodal texts	11
2.3.1 What is multimodality?	11
2.3.2 Multimodal texts in the digital classroom	13
2.4 Teachers' cognition.....	13
2.4.1 Digital competence for teachers	14
2.4.2 Teachers on multimodal texts.....	15

2.4.3 A multimodal learning environment.....	16
2.4.4 The educational plan today.....	17
3.0 Methodology	19
3.1 The approach to the study	19
3.2 Questionnaire	20
3.2.1 The questionnaire’s design	21
3.3 Sampling	23
3.4 Analysis approach.....	24
3.4.1 Quantitative analysis.....	24
3.4.2 Qualitative analysis.....	28
3.5 The Study’s Reliability and Validity	31
3.5.1 Reliability	31
3.5.2 Validity	32
4.0 Results and Findings	33
4.1 The descriptive quantitative data	34
4.1.1 Data with digital tools as the aim	34
4.1.2 Students’ digital skills	36
4.1.3 English digital texts	37
4.1.4 Teachers professional digital skills.....	41
4.1.5 Background questions.....	43
4.3 Qualitative data	44

4.2.1 Teachers knowledge about multimodal texts.	45
4.2.2 Qualitative data gathered from the “other” answer choice.	48
5.0 Discussion	50
5.1 Teachers’ usage of digital tools	50
5.1.2 What do teachers use digital tools for?.....	51
5.1.2 Teachers’ views on their students’ digital literacy.	52
5.2 Teachers’ approach to digital multimodal texts.....	56
5.3 Teachers approach to Professional digital skills.....	59
6.0 Conclusion.....	62
Reference list.....	66
English summary	71
Norwegian summary	72
Attachment 1 – Questionnaire.....	73
Attachment 2 – Mail sent to gain participants.	76

List of figures and tables

Figures

Figure 1. Mind map for question 15. Can you describe what multimodal text is?	30
Figure 2. Do you as a teacher use digital tools in your school classes?.....	34
Figure 3. How often do you as a teacher use digital tools in your English sessions?	35
Figure 4. To what purpose do you as a teacher often use digital tools in your English sessions when you are teaching?	35
Figure 5. To what purpose do you as a teacher let your students use digital tools in your English sessions?.....	36
Figure 6. Do you feel that your students have digital competence? Within this are basic skills, downloading, searching, etc.	36
Figure 7. Which of these digital competence skills do you feel your students have competence in?	37
Figure 8. What do you use when you as a teacher create digital English texts?.....	38
Figure 9. What do you as a teacher use when finding digital English texts?.....	38
Figure 10. What do you encourage your students to use when they are creating digital English texts for themselves?	39
Figure 11. If you encourage your students to vary how they produce their English digital texts, to what purpose do you encourage them?	39
Figure 12. When you as a teacher use digital tools to create/find digital texts, in which scale do you vary the use of different digital tools? When you give your students tasks to produce English texts, to which scale do you vary how they create these texts?	40

Figure 13. Do you feel that you as a teacher encourage variation different programs outside of the regular digital writing book (example Powerpoint, Creaza, video recorder, etc.) when your students are producing something in the English sessions?.....	40
Figure 14. To what purpose do you encourage different programs?.....	41
Figure 15. Do you as a teacher feel that you have a good enough training in PDS (professional digital skills)?	41
Figure 16. Where have you gotten your professional digital skills training?.....	42
Figure 17. How big part of this training did you feel was useful and may use in your English sessions?.....	42
Figure 18. Through this training, did you find new digital tools that you have or wish to use in your English sessions.	43
Figure 19. How long have you been working as a teacher?.....	44
Figure 20. Which gender are you?	44
Figure 21. Demographic background on the teachers' approach to professional digital skills.	62

Tables

Table 1. Main themes and subcategories for qualitative data	45
Table 2. Participants answer to question 15. Can you define the term multimodal text?	47
Table 3. Answers to answer choice “other” in question 14 To what purpose do you encourage different programs?	49

1.0 Introduction

In recent years, the digitalisation of the Norwegian classroom has transformed, and digital tools have become more common from the earlier stage of the Norwegian school system. At the 8th to 10th-grade level, digital tools have become almost necessary for pupils. With this change, teachers have needed to adapt and learn to use digital tools as an essential skill with a pedagogical view, which is necessary for teachers learning. In 2006 the Norwegian Directorate for Education and Training implemented the definition of digital literacy in the curriculum. It encompasses both skills in using digital tools and understanding its role as a new core expertise in the 21st century (ITU, 2005, p. 8). With this rapid evolvement of digital technology, The Directorate implemented digital skills as one of the basic skills in the education for students (Utdanningsdirektoratet, 2020.)

This rapid development of technology in the classroom has brought new opportunities and challenges for teachers and students, and over the years, so has the definition of digital literacy. Arguments of digital literacy can be dated back to the 1980s, when the term computer literacy was a “poorly defined term” according to Goodson and Manang (1996) (Buckingham, 2015, p. 23), to 1997 when the term digital literacy was first seen and used in a published book by Paul Gilster (Secker, 2018, p. 5). Over the years, digital literacy has become a broader form of education about media that is not just limited to mechanical skills but is a more rounded, humanistic conception close to the German notion of ‘Bildung’ (Buckingham, 2015, p. 23). Digital literacy is one of eight key competencies for lifelong learning within The European Communities. In Norway, the term is split into the digital section and the section with competence to apply the knowledge (ITU, 2005, p. 30). Digital literacy can be taken apart into several components, such as basic skills, downloading, searching, navigation, classifying, integrating, evaluating, communicating, cooperating and creating/creativity (ITU, 2005, p. 31).

Digital technology has brought the importance of digital learning and professional digital skills for teachers in Norway. The increasing use of digital tools and resources in the educational system, being a part of the 21st-century skill and implementing digital skills in the educational plan has made PDS education for teachers important. PDS can be explained as a double aspect for teachers, where one is about getting the skills needed, and the other is about having the competence to get the students to understand their learning, production and the

relevance of using digital technologies (Furberg & Lund, 2016, p. 26). Prior studies, through Blikstad-Balas and Klette (2020) and Røkenes (2016), have shown that a part of some Norwegian teachers feels inadequate with their PDS knowledge and that Norwegian teaching education has been behind in their implementation and adaptation of information- and communication technologies (ICT).

With teachers needing more professional digital skills, developing a multimodal learning environment might be challenging. However, with Kress's (2010) description of modes included in multimodality, such as music, image, video, text, speech, and more, using these in an educational setting with the proper professional digital skills could be easy. Multimodality is, according to Kress (2010), Skulstad (2020) and Kress et al. (2001), about communication in the classroom using different modes. This communication is divided into three points. First is the media of communication, the second is the meaning made with language, and the third is the question of what is to be considered a communicative mode (Kress et al., 2001, p. 11). The importance of multimodality in the Norwegian educational plan is communication. In the educational plan for English language learning by The Directorate, the pupils “will use their strategies to communicate verbally and in writing in different situations and with different media and sources” (Utdanningsdirektoratet, 2020). When the Norwegian classroom became digitalised, so did the capability of creating multimodal texts due to the interactive features of the Web. 2.0, expanding the multimodal resources available.

Ultimately, using multimodal texts in the digital classroom is all up to the teachers and their capability and belief in multimodal texts, called teacher cognition (Borg, 2003, p. 81). Therefore, this research asked teachers teaching 8-10th grade from Bergen and Oslo municipalities about how often they use digital tools, how they use digital tools and about their PDS. The data was gained through an online questionnaire, giving both quantitative and qualitative data, making the study a mixed method research (Cohen et al., 2018, p. 32). The quantitative data is analysed and presented through a descriptive analysis using the Wetcher-Hendricks (2011) definition. At the same time, the qualitative data was analysed with a thematic analysis following Braun and Clarke's (2006) six-step guide. The findings present an opportunity to discuss, and the discussion will link the findings up to the relevant theory. The study ends with giving a conclusion to the research done.

Throughout this thesis, the focus will be on if and how educated teachers can approach digital tools from a teaching perspective with the aim of the use and how to improve their multimodal approach. The thesis will also be how they can use these digital tools to help the pupils create, embrace, or enhance multimodal texts, creating a multimodal learning environment.

1.1 Why I chose this topic.

As someone growing up within the rapid development of digital technology, following the rhythm of this continuous development has sometimes been challenging. This continuous development might be why digital technology in the classroom has always fascinated me. How the technology can be used in the best possible way in an educational setting, and how it might benefit the students to engage in a more advanced learning environment. With digital tools, the teacher can be creative in the way they structure the English sessions. Multimodal texts are a fantastic opportunity for both students and teachers to be creative.

With the improvement of digital resources and since the Norwegian Directorate implemented *digital literacy* in 2006, the term and the use of digital tools in an educational setting have been developed even further. New skill areas are configured, such as *use and understand, find and process, produce and treat, communicate and interact, and exercise digital judgement* (Utdanningsdirektoratet, 2017, last edited 15.11.2017). With the further improvement in digital resources still being developed, the need for proper education for teachers and students must be looked into and re-evaluated. With such a development, looking into how teachers in Norway use digital tools has been fascinating. As a soon-to-be teacher, developing strategies and ideas for how I want to teach using both Multimodal texts and digital tools through this thesis has been ideal.

1.2 Research question

With the aim of following up the information given in the introduction, the research question chosen is:

- Are teachers able to use digital tools to develop a multimodal learning environment in the English classroom?

This research question was chosen as it can represent how teachers use their digital resources within the classroom and further investigate if they can develop a multimodal learning environment with their use of digital tools.

1.3 The thesis structure

This thesis is split into six different chapters and aims to go step by step through the included chapters in this thesis. The first chapter is the introduction chapter, briefly simplifying the thesis and highlighting the research question of the thesis.

Chapter two is about theory and background. This chapter explains the theory the thesis uses as its construction blocks. In addition, chapter two enlightens several terms and definitions and explains them from both the informative and the teacher's perspective.

Chapter three will explain the method used in the thesis. It gives details about the choices made by the researcher and the steps to gain the data.

Chapter four will present the data and findings. In addition, there will be a detailed explanation of the data and what information could be gained through this data.

Chapter Five will then discuss the findings of chapter four and how to connect the findings to the theory from chapter two.

The last chapter is the conclusion of the thesis. The conclusion will summarize the main points within the essay and restate the main arguments within the discussion to give the reader a final thought.

2.0 Theory and Background

Several theories and terms are needed to understand and provide a proper discussion of if teachers can create a multimodal learning environment through digital tools. The theory will consist of different terms and terminologies that can be considered vital categories within this thesis. The first category is *digital literacy*, where the term *literacy* will be explained through UNESCO's (2004) definition. The term digital literacy has gone from Goodson and Mangan's (1996) term *computer literacy* to what *digital literacy* means in an educational setting.

The following essential category that will be explained is teachers' *professional digital skills*. Furberg and Lund (2016) explained how this might be seen as a double aspect. In this chapter, Blikstad-Balas (2020) and Røkenes (2016) showed that Norwegian teachers might lack *professional digital skills* through earlier studies.

Multimodal texts are the following essential category. In this subchapter, the explanation of *multimodality* will be briefed through Kress's (2010) explanation, where Kress et al. (2001) talked about three points of multimodal communication in the classroom. After the term is briefed, multimodal texts in the digital classroom will be examined.

The last essential category is teacher cognition, where Borg (2003) explained the definition of the term and how the interest in research in this term has risen in the past 15 years. How teachers think about digital competence and multimodal texts will also be briefed.

2.1 Digital Literacy

Digital literacy is a term that was introduced in the Norwegian educational plan in 2006 and was before introduced, discussed in two different settings. "On one side, referring digital literacy is the focus on skills when using digital tools, as long as it can be placed in a satisfying pedagogical way. On the other side, it was referred to as the understanding of digital literacy as a new member of the core expertise in the 21st century" (ITU, 2005, p. 32). However, what does digital literacy mean? More knowledge of the term 'literacy' would be needed to understand digital literacy.

2.1.1 What is literacy?

“Literacy implies a broader form of education about media, that is not restricted to mechanical skills or narrow forms of functional competence. It suggests a more rounded, humanistic conception that is close to the German notion of ‘Bildung’” (Buckingham, 2015, p. 23).

According to what Buckingham (2015) stated, to be able understand what *literacy* is, the explanation and exploration of what the notion of ‘Bildung’ stands for is needed.

“The word *Bildung* is related from the German verb *bilden* and to the verbal noun *Bild*, that is, image” (Nordenbo, 2002, p. 341). As far back as 1793, Wilhelm von Humboldt defined *Bildung* as:

“The ultimate task of our existence to achieve as much substance as possible for the concept of humanity in our person, both during the span of our life and beyond it, through the traces we leave by means of our vitality activity. This can be fulfilled by *the linking of the self to the world to achieve the most general, most animated, and most unrestrained interplay*. This alone is the yardstick by which each branch of human knowledge can be judged.” (Humboldt, 2000, as cited in Rømer, 2021, p. 35).

Since then, the term *Bildung* has been studied and understood in an educational setting. One that further explains and improves Humboldt’s definition of *Bildung* is Gert Biesta. Biesta (2002) further explained *Bildung* being something that “brings together the aspirations of all those who acknowledge – or hope – that education is more than the simple acquisition of knowledge and skills, that is more than simply getting things “right,” but that it also has to do with the nurturing the human person, that is has to do with individuality, subjectivity, in short, with “becoming and being somebody”” (p. 343). With this definition, *Bildung* can be referred to as an image, even a model image, in agreement with which the student is to be developed. With the explanation of *Bildung*, the term could even be said to refer to an ideal ambition in the educational context (Nordenbo, 2002, p. 343).

After looking at what *Bildung* is and where it originated from, the term *literacy* still needs a further explanation. While Buckingham (2015) talked about *literacy* being a more rounded conception of the word ‘Bildung’, Blikstad-Balas (2016) continued about *literacy* “as individual skills, using texts, practices, and about participation in writing cultures both inside and outside of the school” (p. 16). The Knowledge Promotion Reform introduced in 2006 was a *literacy reform* that concluded a turn to the practice of the subjects, what each individual

does in the subjects, and thus also about access to such communities of practice. Blikstad-Balas (2016) continues to define *literacy* as “a term about being competence that includes reading and writing. In contrast, the individual can create meaning in others’ texts and produce texts themselves” (p. 16). The United Nations Educational, Scientific and Cultural Organization (UNESCO) described *literacy* as “the ability to identify, understand, interpret, create, communicate, and compute, using printed and written materials associated with varying contexts. *Literacy* involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society” (UNESCO, 2004, p. 13). With this definition, *literacy* can be said to play a significant role within educational contexts. Learning the different abilities within *literacy* and continuous learning to achieve goals and develop knowledge and potential correlate with The Norwegian Directorate’s core curriculum. The core curriculum includes core values of education and training, principles for education and overall development, and principles for the school’s practice (Utdanningsdirektoratet, 2020). UNESCO’s (2004) definition of *literacy* will be used in this MA thesis when mentioning *literacy*, as this definition is one of the most used international definitions of *literacy* (Blikstad-Balas, 2016, p. 15).

2.1.2 From computer to digital literacy.

After understanding what literacy means, it is essential to delve into the concept of digital literacy and its evolution in an educational context. The Norwegian classroom has undergone significant changes in the past decade due to its digital classroom reform, but the idea of digital literacy has been around even before this reform. Some argue that the concept dates back to the 1980s when the term computer literacy was used. However, according to Goodson and Mangan (1996), as cited in Buckingham (2015), this term needed to be better defined regarding its overall aims and what it entails (p. 23). *Computer literacy* was defined as a “minimal set of skills that will enable the user to operate effectively with software tools, or in performing basic information retrieving tasks. It functioned as a basic skill that was required to undertake particular operations”. (Buckingham, 2015, p. 23). In 1997, the term digital literacy was introduced by Paul Gilster in his book. He defined it as “the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computer. The concept of literacy goes beyond simply being able to read; it has always meant the ability

to read with meaning, and to understand” (Gilster, 1997, as cited in Secker, 2018, p. 5). Gilster saw digital literacy as distinct from computer literacy, which focused on technical proficiency in operating computers and software. Digital literacy “acknowledged the internet as a medium that required specific literacies to critique information that it provides, separate truth from fiction and understand how hypertext and non-linear reading allows new meanings to be constructed” (Secker, 2018, p. 5). The term provided by Gilster in 1997 may have been ahead of its time. However, with the rapid growth of digitalization and its integration into Norwegian schools, it warrants a closer examination. “Within the EU, *digital competence* has become one of eight key competencies for lifelong learning” (Ryberg & Georgsen, 2010, p. 89), and The European Communities described that *digital literacy* “comprises the skills required to achieve digital competence, such as the use of computer: to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet” (European Communities, 2007 as cited in Ryberg & Georgsen, 2010, p. 89). With digital literacy being such an essential aspect that it is included in lifelong learning, it indicates that the time and practice going into learning this competence is an essential factor in education.

As mentioned briefly in the introduction, the Norwegian Directorate for Education and Training incorporated the definition of digital literacy into the curriculum in 2006. The information on this decision was from a report from the Research and Expertise Network for IT in Education (ITU). The definition from 2006 states: “Digital literacy is skills, knowledge, creativity and attitudes that everyone needs, to be able to use digital media for learning, and to master in a knowledge society” (ITU, 2005, p. 8). According to the Norwegian Directorate for Education, digital literacy is divided into two distinct areas. The first area pertains to digital knowledge, while the second area focuses on applying that knowledge effectively (ITU, 2005, p. 30). The Norwegian Directorate bases this concept on the OECD report DeSeCo (Definition and Selection of Competencies, 2002), highlighting the importance of skills, knowledge, attitudes, and contextual understanding in building competence. The digital aspect of this concept is rooted in the technological advancements of the past 15-20 years (ITU, 2005, p. 30). The Norwegian curriculum breaks down digital literacy into various components, including *basic skills, downloading, searching, navigation, classification, integration, evaluation, communication, cooperation, and creativity* (ITU, 2005, p. 31). However, this thesis will focus on the components that can be included and considered key components in developing a multimodal learning environment. The components included are *basic skills, integration, communication, cooperation, and create/creativity*.

According to ITU (2005), basic skills are “to be able to open software, sort and store information on a computer, and other simple tasks when using computers and software.” *Integration* involves “comparing and combining different types of information concerning composite texts.” *Communication* is when “one can express and communicate information through different media.” *Cooperate* is “to be able to enter into online educational relationships with others, and to be able to utilize the digital technology for collaboration and participating in networks.” *Finally, creativity* is when “one is able by him/herself to produce and compile various forms of information by him/herself such as composite texts, create websites, etc. Furthermore, to develop something new using special tools and software.” (p. 31). According to ITU (2005), integration is the component known as multimodality by the Norwegian Directorate for Education. Nevertheless, understanding the concept of multimodality requires a more in-depth exploration, which will be addressed in the upcoming chapter on "Multimodal Texts."

2.2 Teachers' professional digital skills

Over the last decades, digital tools and available digital resources have played a more prominent role in the Norwegian educational system and how teachers operate in the classroom. Digitalisation has become such a necessity that the Directorate of Education implemented it as a basic skill stating, “Digital skills in English are to be able to use digital media and resources to strengthen language learning, to meet authentic language models and conversational partners in English, and to acquire relevant knowledge in the English subject” (Utdanningsdirektoratet, 2020). With the inclusion of digital skills in Norwegian education, professional digital skills (PDS) for a teacher becomes much more significant. Teachers have to learn how to work with digitisation and not around it. For current teachers, learning through seminars and courses, and for newly educated teachers, through their education. “Digital competence is often referred to as the 21st-century skills, where these digital skills together with the skill of cooperation, problem-solving, creativity and productivity make the central core of the teacher’s competence” (Voogt & Roblin, 2012, as cited in Furberg & Lund, 2016, p. 26).

Before trying to maximise digital learning in the English classroom, we must know what

professional digital learning is. Furberg and Lund (2016) explained PDS for teachers in a double aspect. “The first aspect is about getting the skills needed to appear as a digital competence person. The second aspect is that teachers must have the competence to get the pupils to understand how they can do their learning- and knowledge production and make it targeted and relevant using digital technologies” (Furberg & Lund, 2016, p. 28). These aspects might not be the easiest to follow as pupils' activities that include digital technologies need to balance resisting the temptation for other things and the challenges that can arise with the use of digital tools, such as technological problems.

As the rapid burst in the use of digital resources in schools has been implemented, it is also vital to enhance teachers' digital competence. Røkenes mentioned in his article that a study back from 2013 showed that the Norwegian teaching education was behind in the integration and usage of information- and communication technologies (ICT). Researchers worldwide advise teachers educations to prepare student teachers they must teach ICT in a pedagogical and didactic manner (Røkenes, 2016, p. 49). Even though the study showed that the Norwegian teaching education lacked integration, it is still in a favourable position when we include the technological infrastructure and the access to digital resources. “Almost all educational institutions in Norway have modern digital infrastructure with high-speed internet access, student teachers and teacher educators have access to digital tools and aids throughout the entire education” (Ørnes, Wilhelmsen, Breivik & Solstad, 2011, as cited in Røkenes, 2016, p. 50). In 2013, teacher education also got the framework of making education a five-year-long master's education, which was first implemented in 2017. This education plan established a teacher education with high professional quality and integrity, and coherence between professional subjects, professional studies, and practice (Utdanningsforbundet, last edited 26.02. 2021). The educational plan gave plenty of time for improvements to integrating ICT into education and preparing the new teacher students for the digital classroom. However, even if teachers are getting prepared for this way of teaching, OECD's international study of teachers (TALIS) in 2018 showed that in Norway, one out of five teachers reports a strong need for more knowledge about how to integrate digital technology into their instruction (OECD, 2019). PDS is an area where most teachers identify they need further professional development, where newly qualified teachers or student teachers feel the same way. (Thronsen et al., 2019, as cited in Blikstad-Balas & Klette, 2020, p. 57). How the teachers are feeling means that even though the improvements were made, it is not enough to cover the intention of the plan. If there is such a significant gap in the educational plan, this could

indicate that teachers do not have enough knowledge about the key components of digital literacy, which is mentioned in subchapter 2.1.2. With this gap, the question of whether teachers have sufficient knowledge about using the key components of multimodality with their digital knowledge lingers.

2.3 Multimodal texts

2.3.1 What is multimodality?

Can multimodality only be considered as the component of *integration*, or are there something more behind this term and one of the key competencies of the Norwegian *digital literacy* curriculum and what the Directorate indicate is *multimodality*? When investigating the term *multimodality*, the explanation of the term state that “*multimodality* indicates, it denotes (but not exclusively) simultaneous use of several modes of communication” (Skulstad, 2020, p. 263). These modes are used as being a “socially shaped and culturally given semiotic resource for making meaning” (Kress, 2010, p. 79). These different modes are used to communicate through a multimodal text, and examples of these can be text, image, layout, music, soundtrack, speech, moving image and 3D objects. (Kress, 2010, p. 79) *Multimodality* is considered an interdisciplinary approach that is more than just about language. It is a communicative tool that might help both the communicator in what their message should communicate and the receptor to understand the communication and representation (Jewitt 2009 and Kress 2010, as cited in C. Jewitt, 2013, p. 141). Kress et al. (2001) described that there are three points that inform our account of what we call a multimodal communication in the classroom. Before going over the points, Kress et al. (2001) describe the *media of communication*, which “are shaped and organized by a culture into a range of meaning-making systems” (p. 11). These systems are what are called modes. Further continuing, the first of the points provided by Kress et al. (2001) is that “the meanings made are not always equally accessible to and understood by all readers.” Second point is that “the meanings made with language, whether as speech or as writing, are interwoven with the meanings made with other modes in the communicative context, and this interaction itself produces meaning.” Third point is that “the question of what is to be considered a communicative mode remains open” (Kress et al., 2001, p. 11). Throughout the years since its initiation around 1996, multimodality has developed in different ways. The realm of

multimodality was re-evaluated after being investigated. The re-evaluation gave other approaches, such as film theory, musicology, and game theory, the inclusion to be inspected and studied. “Multimodality thus extends past the traditional psychological and linguistic foundations of print literacy to draw from anthropological, sociological, and discourse theory” (Jewitt, 2008, p. 246).

Over the past years, several multimodal studies have been conducted, with studies aimed at understanding how “semiotic resources are used to formulate discourses across a variety of context and media, for instance: school, workplaces, online environments, textbooks, and advertisements. The relationships across and between modes in multimodal texts and interaction are central areas of multimodal research” (Jewitt, 2013, p. 142). This surge of studies over the past years might indicate that multimodality might be more significant in educational settings than ever before.

Nevertheless, why do teachers need to enlarge their sight and recognize multimodality as a learning tool in the classroom? Gunther Kress states, "If one is to fully recognize the semiotic work learners do when learning, the new circumstances require new thinking about learner agency, pedagogical tools, and pedagogical relations” (de Saint-Georges, 2013, p. 3). The statement from Kress given by de Saint-George might tell that the new thinking required could be what teachers need to embrace. As mentioned earlier, multimodality is about communication, and communication is one of the key elements for English in the Norwegian educational plan from The Directorate. The Directorate has an explicit statement about communication: "Pupils will use their own strategies to communicate verbally and written in different situations and with different media and sources” (Utdanningsdirektoratet, 2020). The first statement from The Directorate can be linked to what Kress (2010), Skulstad (2020) and Jewitt (2013) all mention that multimodality is about communication. With this communication, it is up to each student to find their communication strategy. At the same time, it is the teacher’s responsibility to help along this journey of finding their strategy. Multimodality can also be found in another of the Directorate statements about language learning, where “language learning happens with English texts. The term text is used widely, as it comprehends spoken and written, printed and digital, graphic and artistic, formal and informal, fiction and non-fiction, from present and past” (Utdanningdirektoratet, 2020). These elements in the educational plan show explicit traces of multimodality. The words chosen may differ, but the similarity of what Kress (2010) mentioned can be seen in The Directorate's second statement, where texts can be used to communicate through different

modes. These statements might indicate that learning about multimodality and how to create multimodal texts might be worth the investment for both teacher and student.

2.3.2 Multimodal texts in the digital classroom

The two prior statements from the Directorate all include some digital traces, either the word digital or through media. Some digital resource is inclined to be used by teachers to teach their students these two statements. The digital world has evolved and so has the capabilities of multimodal texts. With this evolution, the students' capabilities of creating texts using their computers have also increased from creating a text with the students writing with pen on paper to being more creative in their own path on how they want to write. The digital world has enhanced the digital texts and multimodal texts because of the interactive features of Web 2.0 (Jenkins, 2006, as cited in Molin & Godhe, 2020, p. 153). "Web 2.0 is a term popularized by the business guru Tim O'Reilly to describe the revelation of the digital economy fuelled by the large internet companies such as Myspace, Facebook, Flickr, YouTube and more" (Jenkins, 2006, p. 179). Furthermore, with this digital world change, so has the digital landscape of the classroom. Significant changes include the extensive information flows through the internet, interactive whiteboards instead of blackboards and chalk, and computers for every pupil, as mentioned earlier. "These changes have expanded the multimodal resources available to students, multiplied the reading path to be navigated, and introduced practices of re-mixing and redesigning of communicational forms" (Leander & Frank, 2006, as cited in Jewitt, 2013, p. 143). Given these changes, producing multimodal texts for pupils has exceeded to a new level. The options for what they can use have evolved. Constructing multimodal texts, using different modes such as video clips, sound, and image, is an intentional design "in which creators shape the resources available so that the representations match their intentions" (Kress, 2010, as cited in Molin & Godhe, 2020, p. 154).

2.4 Teachers' cognition

Teacher cognition refers to "the unobservable cognitive dimension of teaching – what teachers know, believe, and think" (Borg, 2003, p. 81). Within the past 15 years, there has been a surge of interest in studying language teacher cognition. The surge of interest might state that there is something in teacher cognition that proves the benefits of knowing about the

term and its relationship to teachers' classroom practices. Borg (2015) explained how the recognition of how teachers are shaping the classroom, through their decision-making, thinking and how active they are. Borg (2015) continues to provide how this “might be a key factor driving the increased research in teacher cognition, not just in language education, but in education more generally (p. 1). With the definition and statement provided by Borg, *teacher cognition* is relevant for this MA thesis topic as teachers wanting to create a multimodal learning environment in the English classroom is about shaping the classroom to their beliefs on how to create the best possible environment for the pupils.

Teachers want to prepare the pupils for the “adult life” and how to face the world after they are done in school. Furthermore, in the English classroom, one of the primary purposes is to teach pupils the English language. However, English is much more than just a foreign language. It is a global language spoken worldwide and is widely used in large industries, gaming, films and more, so making the pupils learn English prepares them to face the world outside. Meaning that making the pupils learn English is to prepare them to face the world outside. “Developing the students’ digital competence is a central task for which the school is responsible. There is also a broad agreement that digital technologies might enhance the pupils learning in subjects. However, this does not mean every digital tool session is used properly” (Blikstad-Balas, 2016, p. 136). As mentioned earlier, if one out of five teachers has a strong need for more knowledge about integrating digital technology into the classroom and about ICT, how are teachers supposed to learn away something that one out of five of them do not feel qualified enough to bring into the classroom as stated in the earlier chapter.

Nevertheless, even though these studies have been given, teachers still have a positive attitude toward ICT and the use of ICT in the classroom (Blikstad-Balas & Klette, 2020, p. 58). Teaching while using ICT can represent several new opportunities but also several challenges where one of them mentioned is a need for digital competence. Due to one of them being a need for better digital competence, makes it essential to be aware of the complexity of digital competence. “The way teachers carry out and experience the pedagogical use of ICT will very often depend on their high or low digital competence” (Krumsvik et al., 2016, p. 146). With all the information gained, what does digital competence mean for teachers?

2.4.1 Digital competence for teachers

Krumsvik et al. (2016) mention in their article about recent studies that there needs to be more clarity on what digital competence means for teachers, pupils, teacher students, teacher educators and school leaders. Is it the same across these groups, or is it different? Moreover, what constitutes teachers' digital competence in a school context? There might be a connection between why in Blikstad-Balas and Klette's (2020) study where one out of five teachers needs more knowledge about PDS and the question Krumsvik et al. (2016) ask about how everyone conceptualises digital competence. Both student teachers and novice teachers report that they do not feel that their teacher education has prepared them to use ICT in their classroom, and many have called for more systematic approaches to ICT in teacher education (Blikstad-Balas & Klette, 2020, p. 57). These studies give out an eclectic vibe about how teachers approach digital technologies and how they comprehend them. This thesis will continue to investigate how teachers approach and feel about PDS in the "Methodology/Findings" chapter.

2.4.2 Teachers on multimodal texts

The necessity of teachers' knowledge about PDS and the necessity for a broader knowledge about what literacy is are needed. With children and young adults increased supply of multimodal texts could represent great challenges for the school's facilitation of the pupils learning. The question is about which forms of literacy are needed to fully utilise the new convergent technologies for communication and knowledge sharing (Dons, 2006, p. 62). One example of multimodal text being used more after digital tools became integrated is digital stories. These stories are short and include modes such as sound, image, video, written text, and more, which might strengthen or weaken the content/message. Like digital stories, digital tools have, according to Lambert (2012), had a substantial impact on how people might communicate and express themselves. With this impact, technologies have enabled digital stories to emerge in schools (Aagaard, 2014, p. 194). Teachers' interest in digital stories has evolved since the national curriculum was launched in 2006 when digital literacy was listed as a basic skill to be developed in all subjects. Teachers are responsible for developing students' multimodal competencies, and many have recognised digital storytelling as a relevant activity (Aagaard, 2014, p. 195). Norwegian teachers might be more responsible and conscious about what they use when teaching in the English classroom. "There are three different roles the teacher needs to be able to use to contribute to the student's learning in a complex multimodal

digital world. These three are a teacher *as a resource manager*, teacher *as a co-constructor of knowledge* and teacher *as a design consultant*” (Larson & Marsh, 2005, as cited in Dons, 2006, p. 63). The teacher as a *resource manager* needs to “contribute with resources that support the pupils developing of skills, knowledge and understanding to analysis and produce multimodal texts.” The teacher as a *co-constructor of knowledge* needs to “relate that sometimes the pupil on some areas might know more than the teacher and that both the teacher and pupil might learn from each other.” And lastly the teacher as *design consultant* “needs to give educational feedback on the product and design. The teacher does not need to be an expert on multimodal texts, but has the knowledge about the education and the educational plan” (Larson & Marsh, 2005, as cited in Dons, 2006, p. 63)

2.4.3 A multimodal learning environment

Teachers' ability to develop a multimodal learning environment through digital tools depends on the teachers' knowledge of PDS and their knowledge of Multimodal texts. Nevertheless, what can be defined as a multimodal learning environment? The definition of a multimodal learning environment was given by Moreno and Mayer (2007), and is defined as

“A learning environment that use two different modes to represent the content knowledge: verbal and nonverbal. In multimodal learning environments, students are presented with a verbal representation of the content and a corresponding visual representation.” (p. 310)

Using the technology available in the classroom should be sufficient to create a multimodal learning environment where two different modes can be used, and several of the modes mentioned by Kress (2010) could be included. To be able to use these different modes, different technological channels can be used, where a channel is referred to as “a medium for supporting a way of experiencing course content, such as classrooms, computers, or mobile phones” (Xiao et al., 2020, pp. 164-165). The digitalised classroom has several of these channels available that could be used to develop a multimodal learning environment. It is up to each teacher to make use of these channels based on the teacher's knowledge of how to operate these channels and belief that using multimodal texts is an essential aspect of their teaching. The importance of a multimodal environment is that “it might enhance student understanding, by adding a non-verbal knowledge representation to verbal explanations”

(Fletcher & Tobias, 2005, as cited in Moreno & Mayer, 2007, p. 310).

2.4.4 *The educational plan today.*

Since the Norwegian Directorate implemented *digital literacy* in 2006, the term and its usage in an educational setting have been developed even further. Within the framework of basic skills, which was revised in connection with the curriculum renewal and established in 2017, the Norwegian Directorate states the following:

“Digital skills would be obtaining and processing information, being creative and innovative with digital resources, and communicating and interacting with others in digital environments. It involves being able to use digital resources appropriately and cautiously to solve practical tasks. Digital skills also involve developing digital judgement by acquiring knowledge and good strategies for online use”

(Utdanningsdirektoratet, 2017, last edited 15.11.2017).

Within this renewal, there are several skill areas. These areas are *use and understand, find and process, produce and treat, communicate and interact, and exercise digital judgement*. These areas explain the skills needed for learning. It is up to the respective teacher to assess and understand the values these skill areas possess in a possible multimodal learning environment.

Use and understand “means being able to use and navigate digital resources inside and outside the network and safeguard information and data security” (Utdanningsdirektoratet, 2017, last edited 15.11.2017). The students use these digital resources, such as digital equipment, software, or digital measuring instruments, to convey messages using effects, images, sound, illustrations, and more. To be able to use these resources is critical if a teacher wants to develop a learning environment using multimodal texts.

Find and process “involves acquiring, processing, interpreting, and assessing information from digital sources, exercising source criticism and using source references” (Utdanningsdirektoratet, 2017, last edited 15.11.2017). The information gained from these digital sources can be information from text, sound, image, video or other interactive elements. To be able to understand the information gained is a positive side. Therefore, when the first skill area was to convey, this skill area focused on how to receive and understand.

Produce and treat “means being creative and innovative with the use of digital resources. This involves creating digital products using digital resources either through innovation or further development and reuse” (Utdanningsdirektoratet, 2017, last edited 15.11.2017). The skill area *produced and treated* can be a big part of a multimodal environment. The ability to create and be creative with digital text are essential aspects to learn when creating digital multimodal texts.

Communicate and interact “means being able to use digital resources for communication and interaction. Digital interaction involves the use of digital resources for planning, organizing and carrying out learning work together with others” (Utdanningsdirektoratet, 2017, last edited 15.11.2017). Multimodality is about the sender’s ability to communicate through different modes, according to Skulstad (2020), giving this skill area a large part to play if and when a teacher wants to develop a multimodal learning environment.

Exercise digital judgement “means following rules for privacy and showing consideration for others online. It is about using strategies to avoid unwanted incidents and showing an ability for ethical reflection and assessment of one’s own role online and in social media” (Utdanningsdirektoratet, 2017, last edited 15.11.2017). This skill area might not be the teachers' first priority when developing a multimodal environment. However, the skill area is a vital aspect of every digital environment when creating a safe environment where no student might end up being afraid of their role in the digital world.

3.0 Methodology

This MA thesis study goal is to look deeper into whether teachers know how to utilise digital tools and how to use digital tools to create a multimodal learning environment. This chapter will consist of which method was used to conduct this study, how the planning and design of the study was done and how the study was conducted and explain the reasoning behind the choices made in the study. This chapter will also consider the validity and reliability of this study and mention the ethical considerations needed when conducting this type of research.

3.1 The approach to the study

From the start of the planning phase of this MA thesis, some methods can be considered when a researcher is going to gather the research materials needed for this study. The approach of choosing either qualitative or quantitative study or mixed method study was carefully considered. A qualitative research method often provides an in-depth and detailed understanding with fewer participants through a more verbal approach, such as doing interviews with the participants. While a quantitative research method through a more statistical approach with a broader range of participants, often seen through questionnaires or tests. The last research method that could be used is mixed method research (MMR) (Cohen et al., 2018, p. 32). MMR is a research method where the researcher “defies simple or single definitions and consists of various elements of both quantitative and qualitative approaches” (Cohen et al., 2018, p. 32).

This study aimed to explore how a more comprehensive range of teachers in Norwegian schools and how they utilise their digital tools meant that which approach to be chosen would need careful consideration. After carefully considering the different types of methods, the study tilted in favour of an online questionnaire from Surveyexact, provided by the University of Western Norway. This tool gave the ability to gather both qualitative and quantitative data, which was an easy way to create and collect the necessary data. Thus, the approach of a mixed method research was chosen for the research question:

- Are teachers able to use digital tools to develop a multimodal learning environment in the English classroom?

This research question was meant to meet the broader aspects of teachers and see how a more

significant number of teachers might help the research on how the teachers could develop a multimodal learning environment through digital tools. Thus, the data needed to answer this question would be from a broader range of teachers to create a baseline of where they are in their digital skills, as well as how well they know multimodal texts and how often they try to combine both elements into creating digital multimodal texts. As the questionnaire was being developed and questions were being created, more and more questions in the questionnaire were targeted towards having both quantitative and qualitative elements. As the questionnaire gave quantitative and qualitative data through mixed-method research, most of the data collected was quantitative. This data will be analysed with a descriptive analysis, mainly using Wetcher and Hendricks (2011) and Cohen et al. (2018). The qualitative data collected will be analysed using a thematic analysis provided by Braun and Clarke (2006). These analysis methods will be further elaborated on later in this chapter after looking at why this thesis uses a questionnaire and how the samples were collected.

3.2 Questionnaire

A questionnaire to gather research data is widely used, as a well-constructed questionnaire can give reliable and reasonable answers (Anderson et al., 1998, p. 170). Moreover, using a data collector that most participants are familiar with might a questionnaire offers the benefits of being quick and easy to complete from a large sample of teachers and also giving a reliable and valid answer from the teachers that did complete the questionnaire (Cohen et al., 2018, p. 471). As a questionnaire is defined as “any written instruments that present respondents with a series of questions or statements to which they are to reach either by writing out their answers or selecting from among existing answers” (Brown, 2001, as cited in Dörnyei & Taguchi, 2009, pp. 3-4).

As Dörnyei and Taguchi, (2009) mentions, three data types could be collected from a questionnaire. These three are factual, behavioural, and attitudinal data. Dörney and Taguchi (2009) continue to describe these as “factual questions and data are used to find out about the respondents, behaviour questions and data are used to find out what the respondents are doing or have done, and attitudinal data and questions are used to find out what people think, which concerns attitudes, opinions, beliefs, interests, and values” (p. 5). Through this information, the questionnaire of this study will focus on attitudinal data. This study wants to look at teachers’ attitudes and opinions on digital tools and their own PDS, as well as their interest in

and how they utilise digital tools when creating and/or using digital texts.

Creating a questionnaire that has an appealing design and is easy to complete, where the questions do not confuse the participants but instead make them think about what they do when they are teaching in the classroom, was the thought process when moving on to the questionnaire design.

3.2.1 The questionnaire's design

When designing the questionnaire some factors must be considered when creating and conducting the research questionnaire. Dörney and Taguchi (2009) present some general features when designing a questionnaire that has been implemented and thought of when designing this questionnaire. These features are the “*length of time to complete the questionnaire, format characteristics and anonymity*” (p. 12). It was also essential to look at research done in the same category as this helped design the questionnaire, thus enhancing this study's validity and/or reliability (Gideon, 2012, p. 95).

The first feature was the length of the questionnaire. What is the optimal length of a questionnaire, and how many questions were needed to cover what was thought to be enough ground to give a good result for the research? When designing this questionnaire, the most optimal time to complete the questionnaire was around ten minutes. This length of time was within the range of what Dörney and Taguchi (2009) talked about when considering the appropriate length of the questionnaire. Their preferred length should be no more than 30 minutes and not more than four pages long. This length of completing a questionnaire corresponds with what Anderson (1998) says about the length of the questionnaire, stating that the questionnaire should be limited to four pages. The number of pages used within the questionnaire was hard to determine, as the questionnaire was online and not in paper form.

The next feature in designing the questionnaire was the layout. As mentioned earlier, the research instrument used was an online survey, as the layout was a tool available from the University of Western Norway. This tool made the layout design easy to understand the origin of where the questionnaire was sent, as it has the logo of the school on the online survey. The online survey also creates a visually appealing questionnaire that can be considered an essential factor (Anderson et al., 1998, p. 179). Cohen et al. (2018) discuss the pros and cons of using an online survey. There are several pros when using an online questionnaire. First,

the speed of distributing the questionnaire is fast and, thus, can get a broader and larger sample base by using the internet. These pros made using an online questionnaire an easy choice as it made it easy to send out to teachers in different schools and easy to access for the participant. It provides expanded opportunities when research is conducted online as a web survey, such as reaching participants that might be challenging to reach (Wright, 2019, p. 1341). Finally, a web-based questionnaire allowed the research to be sent to other schools. Where the samples were gathered will be further talked about in subchapter 3.3 called Samples. Having an online questionnaire also makes it easy to access the data via the software used, and the data can easily be exported/imported for analysing. Anonymity is also a con, which will be further disclosed later in this subchapter.

However, there are also some opposing sides to using an online questionnaire. Such as, the participants might see the invitation to participate as spam and thus ignore it. Abandonment and dropout are severe opposing sides, as it is easy to stop answering the questionnaire and just shut down the survey. Furthermore, some respondents might deliberately give a fake answer, leading to misreporting and inconclusive answers. These answers can be considered an opposing side of a questionnaire. Lastly, the participants might face computer or internet trouble. Such a problem could lead to the respondent not finishing the survey as they might not enter the survey again (Cohen et al., 2018, p. 363).

The last feature mentioned by Dörney and Taguchi (2009) is anonymity. They describe anonymity in questionnaires to diffuse sensitive items or topics. Anonymity is a precaution, as some questions might be difficult to answer 100% honestly if the questionnaire was not anonymous. Keeping the survey anonymous could also raise the participant number, as the participants might be shy or anxious to answer a survey sharing sensitive or personal information (Wright, 2019, p. 1345). Thus, this was not something that needed to be considered as the topic of this thesis does not need sensitive information from participants, so giving the participant anonymity was a choice made from the start. When using the online survey from Surveyexact, a researcher can easily choose to make the questionnaire anonymous, which makes it the perfect research tool for this thesis. Another reason the questionnaire was chosen to be anonymous is that approval from the Norwegian Centre for Research Data is not needed. Approval from the Norwegian Centre for Research is only needed when creating research using sensitive and personal data.

Considering these features, the questionnaire ended with 21 questions, where every question

was mandatory. The questions were created and optimized based on Anderson's (1998) teaching. The questions were also in Norwegian, as this would give the best outcome of answering due to the fact that it should take minimal time to participate in the questionnaire. The questionnaire used various questions forms such as multiple choice, Likert scale, and comment on. These question forms were needed, as the survey needed to collect both quantitative and qualitative data. After creating the questions, these were sent to this thesis's supervisor and changed to fit better into the theme of this thesis. After reforming the questions, the questionnaire was sent to two teachers that pilot-tested the questionnaire, as this is Anderson's (1998) fifth step when creating a questionnaire. After the pilot testing, the last editing was done, giving the final result of the questionnaire that was ready and sent out. The questionnaire is posted in Norwegian as Attachment 1 but has been translated into English further into the thesis.

3.3 Sampling

When the questionnaire design was completed, the next step to gather data would be to obtain participants. As mentioned earlier, using an online questionnaire makes it easy to send out and easy to access by the participants. As Wright (2019) stated, using an online survey can make it easily accessible over a larger area and bypass spatial, chronological, and material constraints. Using the online network of Bergen Kommune and Oslo Kommune, the survey could be sent over to every school in these municipalities. The survey was sent over via email and instructions to each supervisor in the schools with teachers teaching 8-10th grade English. This attachment can be seen in the last subchapters, on Attachment 2. The instructions stated what the survey was about, what the intention was, and that the survey was anonymous. Using this method of approach ended in a result that ensured that the questionnaire was answered by participants who could give clear and reasonable answers to the questions. In the invitation to participate in the online survey, the participants were made sure that this would be anonymous and that no sensitive or personal information would be included in the survey. Keeping this survey anonymous was considered positive, as in terms of self-report questions, anonymity might make it easier for the respondent to tell the truth (Wright, 2019, p. 1345).

As mentioned earlier about the pros and cons of using an online questionnaire, some schools replied with an answer of not wanting to participate. They had too much on the agenda at the time, so they would not consider participating in a study. Others had too many other requests

and thus did not want to overload their teacher further with participation. Nevertheless, there was also feedback where they replied with positive answers.

Time started to close into where the data needed to be analysed. Within the timeframe of when the questionnaire was sent out for the first time and when it was closed due to the time needed to analyse the data, the number of participants reached 46. However, six of these participants did not fully complete the survey but only partially completed it. The data gained from these six participants were considered an error, as the data were assessed as inconclusive data gained. Thus, the final number of participants in the survey ended at 40 participants. This sampling error is higher than the margin of error that should be allowed in a survey, according to Harris (2016). According to Harris, (2016)“ The larger the sample size the more representative it will be and the more power it will have for making accurate and reliable interpretations of the data.” “The error margin that should be tolerated is generally 5%” (p. 205) and should thus only be two or three participant errors in the survey.

3.4 Analysis approach

Robson and McCartan (2016) gave an excellent description of what an analysis is; “To analyse something is a ‘breaking up’ of something complex into smaller parts and explaining the whole in terms of the properties of, and relations between, these parts” (p. 408). This chapter aims to explain how the analysis process has been done and what led up to the choices of which analysis method to use in this thesis. As this thesis uses a mixed method research, both the qualitative and the quantitative analysis will be briefed upon

3.4.1 Quantitative analysis

The quantitative data collected and analysed will be done under a descriptive analysis. A descriptive analysis is when the data collected describe or explains the data gathered from the subjects from the survey that supplied data for the study. This data description serves as the first step for a detailed analysis (Wetcher-Hendricks, 2011, p. 33). More details on what descriptive data is will mentioned in chapter 3.4.1.3 When advancing into and analysing the data of quantitative research, there are some foundations we must look at before conducting the analysis. Cohen et al. (2018) mentioned some essential foundations in statistical analysis. This corresponds to Wetcher-Hendricks’s (2011) vision of organising quantitative data. These

essential foundations mentioned are looking at the scales of the data, if the data is parametric or non-parametric, look if the data is descriptive or inferential, and to see if the data is dependent or independent. These will be further looked at, and their reliability for this thesis is in the sub-chapters.

Level of measurement

When starting to analyse the data collected, the first thing to look at is what type of *scales* the data collected can be categorised under and will be discussed as scales in this research. These are also called levels of measurement (Wetcher-Hendricks, 2011, pp. 12-13) but will be referred to as scale within this thesis. There are four different *scales* or measurements of data that can be categorised. These four are *the nominal scale*, *ordinal scale*, *interval scale*, and *ratio scale* (Cohen et al., 2018, pp. 725-726). Cohen et al. (2018) describe these scales as presented.

A nominal scale “denotes categories. The categories are mutually exclusive and have no numerical meaning. Nominal data include items such as sex, age group, subject taught, type of school and socioeconomic status”(Cohen et al., 2018, p. 726). As there are several questions withing this survey that can be categorised into exclusive categories and does not have a numerical meaning, nominal data is a perfect scale classification for these questions. The ones that in this survey can be put into the nominal data scale is sex, age group, if they have or have not taught English as a subject, about basic digital skills, and question about the teachers’ professional digital skills.

Cohen et al. (2018) described the *ordinal* scale as “classifying and introduce order into the data. The *ordinal* scale is often used in rating scales, where it is possible to place items in an order, weakest to strongest” (p. 726). This is seen in respective questions within the survey, where the participants would use the Lickert scale question form. Therefore, gaining ordinal data can be considered a great asset to use when analysing questions where there is a ranking system as the answer and when data consist of “either measured behaviour, attitude, or characteristics data” (Wetcher-Hendricks, 2011, p. 11).

The *interval* scale is described by Cohen et al. (2018) as “a scale that introduces a metric with both a regular and an equal interval between each data point. The scale also keeps the features from the previous two scales, classification, and order” (p. 726). However, as this is used more when finding the difference between two variables, this will not be used as a

measurement tool in this thesis.

“The *ratio* scale embraces the main features of the three previous scales”, which is “classification, order, and the equal-interval metric - but adds a fourth, powerful feature: a true zero” (Cohen et al., 2018, p. 726). The true zero point could be found a lot within this questionnaire. If no participants answer an alternative, a true zero point would occur. True zero often appears when measuring a quantity that is able to have a zero point and would be in this data if no teachers answered an alternative. With *the ratio* scale as a measuring point, the scale “enables the researcher to determine proportions easily” (Cohen et al., 2018, p. 726).

The different scales in this thesis conclude that they have different measuring capabilities in the data collected. In the different data collected, the different scales have different purposes. “Nominal scales allow for recognition of subjects’ distinguishing factors and ordinal scales allow ranking for subjects. While ratio scale moves beyond the other two and allows for relative comparison between subjects” (Wetcher-Hendricks, 2011, p. 13)

Parametric or non-parametric

When given a brief detail over what kind of scale is used on the data, we move on to determine if the data is *parametric* or *non-parametric*. “In *parametric* data, we find an assumption of knowledge of the characteristics of the participants”, while “*non-parametric* data are those which make no assumptions about the population. This is because the characteristics of the participants are unknown” (Cohen et al., 2018, p. 727). As this is an online survey, where the characteristics of the participants are anonymous, and the only thing gained from them is which sex and for how long they have worked as a teacher, the data in this thesis is therefore concluded to be non-parametric. This correlates to the scales used, as nominal and ordinal scales are often applied in non-parametric data. Data gathered from questionnaires is often non-parametric (Cohen et al., 2018, p.727).

Is the data descriptive or inferential?

When data is *descriptive* means that the data that is collected describe and present the findings. There is no attempt to make inferences or predictions about the collected data. The

data is reported as they have been found. Meanwhile, *inferential* data has “a strive to predict and interferences based on the data gathered” (Cohen et al., 2018, p. 727). This thesis is not to make assumptions or predict and draw a conclusion on the outcome of every teacher but to describe and present the findings of what this thesis has gathered from the data. With the explanation of descriptive and inferential data, this thesis will be conducted with descriptive data.

Variables

In the data collected, some variables need to be looked at and briefed. A variable is considered either a construct, operationalised construct, or particular property as to what the researcher is interested in. These variables are either *dependent* or *independent*.

“An *independent* variable is an variable that is not affected by any other variables” (Cohen et al., 2018, p. 728). In the questionnaire, some questions do not need to lean toward any other questions. These questions are what give independent variable data. The independent questions in this thesis are 1. “Do you as a teacher use digital tools in your class sessions,” 5. “Do you feel that your students have enough digital competence? Within this are...”, 15. “Do you as a teacher fell that you have gotten a good enough training in PDS (professional digital skills)”, 20. “How long have you been working as a teacher?” and question 21 “Which gender are you?”. Question 13. does not necessarily lean toward other questions. The question asks the teachers, “Do you feel that you as a teacher recommend variation of different types of programs outside of the usual digital writing book when your students are creating *something* in the English classes.” Even though question 13 depends on question one as to whether the teacher does or does not use digital tools in the classroom. The reason is that this research is about how teachers use their digital skills in a teacher setting. Thus even though question 13 is dependent on question 1, it creates a new subcategory where they use different types of programs and not just a different variation of texts.

After the independent questions, the next in line is the dependent data that is gathered throughout the survey. “A *dependent* variable is a variable whose value depends to some degree on that of one or more independent variables” (Cohen et al., 2019, p. 728). These questions are answered after an independent question in the survey as these questions are dependent on the previous one. These dependent questions were thus categorised into which

independent questions they were dependent on.

Cohen et al. (2018) described two other variables as well that should be included or considered in an analysis. These two are if the data is a *moderator* or if is a *mediator*. “A *moderator* variable is one which affects the strength and/or the direction of a relationship between two other variables.” While “a *mediator* variable is one that explains the relationship between an independent and a dependent variable” (p. 729). Although there are few cases of *mediators* in this research, there are some variables that could be considered a *moderator*. For example, a *moderator* in this study’s case could be on how gender determines how teachers use digital tools or if how long the participating teacher has worked would affect other categories. Such a moderator variable will be further analysed and viewed in the result.

Lastly, the last variable to consider in the survey will be the *categorical*, *discrete*, and *continuous* variables. Cohen et al. (2018) describe these as “a *categorical* variable has categories of values,” and “a *discrete* variable has a finite number of values of the same item.” “A *continuous* variable is a variable that can vary in quantity” (Cohen et al., 2018, p. 730). There are no *continuous* data in this thesis, while some can be considered *categorical*, and some could be considered *discrete*, as this will be further enhanced in the analysis chapter.

3.4.2 Qualitative analysis

As the survey also has questions that can be considered a mix of both quantitative and qualitative given data, this thesis will use what is called a thematic analysis on the small qualitative selection of the data collected. The qualitative data could be collected through the survey on question 15 and every multiple-choice questions where the answer alternative *other* could be found. Thematic analysis has six steps to follow when following Braun and Clarke's (2006) guide when going through the analysis. These six steps are firstly where the researcher needs to *familiarise* himself- or herself with the data gathered. After this, the researcher needs to *generate initial codes*, *search for initial themes* that might be used, *review* these themes, *define* the themes, *name* the themes, and, lastly, *produce the report* (Braun & Clarke, 2006, p. 87). Even though the qualitative data is a small amount of the data gathered, it is still essential to analyse it precisely. Thus, following Braun and Clarke's (2006) six step guide can be considered a helpful resource when conducting an analysis on qualitative research data.

The first step in Braun and Clarke’s (2006) guide was as the researcher is to familiarise with

the data collected from the questionnaire. The first step was done after going through the quantitative data. When doing this after the quantitative data made it easier not to mix up the quantitative and qualitative data gathered. The data gathered from the survey was stored online on the Surveyexact account, which the Western Norway University of Applied Sciences provided. Analysing in this order made it easy as a researcher to go through the data collected, take notes and make several ideas as to what categories should be created. As the data was gathered through a survey and not through interviews or other verbal data methods, the data did not need to be transcribed. “As Transcribing would mean to write down verbal data into written form” (Braun & Clarke, 2006, p. 87)

The next step for Braun and Clarke (2006) is to generate initial codes. After the data was familiarized and a list of ideas about what the data included was created, the next step of creating initial codes can be started. “A code identifies a feature of the data that appear interesting to the analyst and refer to the most basic segment, or element, of the raw data or information” (Boyatziz, 1998, as cited in Braun & Clarke, 2006, p. 88). When starting to create the codes for the qualitative data, some of these could already be determined, as the researcher might have a specific question that might generate these codes. This was the case in some of the qualitative data in this thesis. Question 15 in the questionnaire, when asking the participating teachers what they think a multimodal text is, was a predetermined code and finding teachers' knowledge on multimodal texts was a feature that was interesting and thus wanted to gain more information. In the thesis, there were also some new codes produced. These codes were dependent on the answers the teacher gave on the open-ended question alternatives in the questionnaire called *other*. These answers were then given new codes depending on what the teachers answered on these question alternatives. One of these codes created was gaming.

When the initial codes to the qualitative data were determined, searching for initial themes that can be used is the next step in Braun and Clarke's (2006) six step guide for thematic analysis. Searching for a theme involves a re-focus on the analysis at a broader level, where the codes made have been identified and can be put together into potential themes. “In this phase, a visual representation where sorting codes into themes could be helpful” (Braun & Clarke, 2006, pp. 89-90). A visual representation has been done through a mind map within this thesis, as seen in Figure 1. The relationship between codes and different levels of themes was created in this stage. As the qualitative data gathered from the questions in the questionnaire predetermined some of the codes found, making the theme of these codes

somewhat predetermined as well. The main theme gained from question 15 was identified as “Multimodal texts” and further developed into subthemes. These subthemes started with teachers knowing or not knowing multimodal texts and were developed even further according to the codes from the data. The exact process was done for the questions with the question alternative *other*.

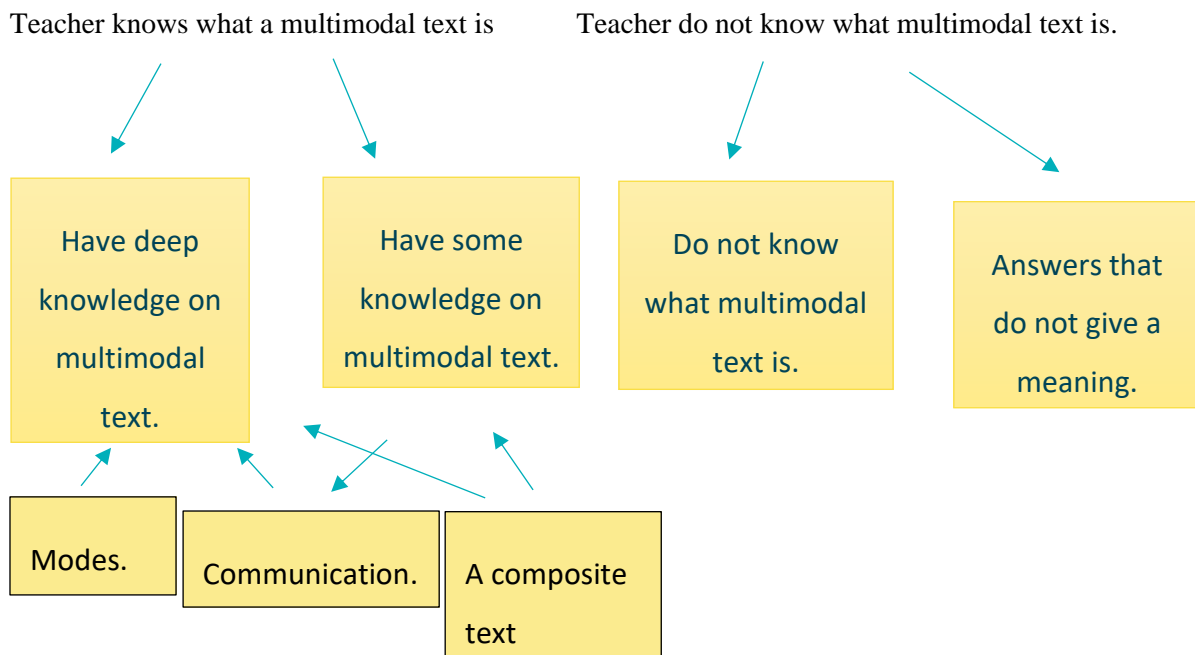


Figure 1. Mind map for question 15. Can you describe what multimodal text is?

After searching for and identifying the themes, the next phase was to improve further the themes made. In this phase, the themes needed further investigation to see if they had enough data to support them or if they collided with each other (Braun & Clarke, 2006, p. 91). Within this phase, the themes would be reviewed to see if the data collected was enough to support the theme of the thesis. This phase was done to improve the results and findings of the data collected and was a process that was continuously done throughout the evolvement of the themes. Within this phase, the subtheme name from the mind map, shown in Figure 1, was redefined into more appropriate names.

When improving the themes was done, the themes need to be defined and given names. Defining and naming mean “finding and identifying the essence of what each theme” (Braun & Clarke, 2006, p. 92). These names are the initial themes used in the report. The themes are identified and examined if they correlate with the quantitative data collected. The quantitative

data on multimodality included data from questions 7-14 to see if the subthemes created had names that correlated to what the teachers responded to on these questions.

The last phase is producing the report. Producing the report is the actual result of the data collected and analysed. The last phase is an ongoing process, proving that the quality of the research is on par with how the researcher wants it to be (Braun & Clarke, 2006, p. 93).

3.5 The Study's Reliability and Validity

A trustworthy study is to reassure that the data collected and how the data is interpreted and done in what the researcher would consider a correct and responsible way. A researcher must acknowledge and understand that threats might target the study's reliability or validity. Instead of looking away from these threats, the researcher needs to have attention to the study's validity and reliability throughout the entire research (Cohen et al., 2018, p. 245). As for this thesis, when developing and using a survey, the survey is subjected to a variety of procedures to increase both its validity and reliability and to reduce the errors that may occur (Harris, 2016, p. 203).

3.5.1 Reliability

Reliability is as “an umbrella term for dependability, consistency, and replicability over time, over instruments and over groups of respondents” (Cohen et al., 2018, p. 268). Reliability can be toned into if the result of the research is trustworthy and believable. Reliability is essential when wanting to conduct both quantitative and qualitative research where the different methods seek out trends, patterns, predictability and/or control. Reliability can be narrowed further down to “the relative absence of error of measurement in a measuring instrument” (Gideon, 2012, p. 399).

This study's reliability lies in going detailed into the study's progress, giving out not only the victories found in the study but also the errors. Using an online questionnaire as an instrument of research could enhance reliability, “because it is anonymous, it may might encourage greater honesty” (Cohen et al., 2018, p. 278). Nevertheless, the downside is that it is harder to discover any dishonesty. The trust of whether the participants answer honestly or randomly because the participant answers out of courtesy. As mentioned earlier in the sample chapter,

an error sample was higher than what should be allowed in a survey, as this sample was greater than 5% of the sample size. To increase the validity of this research, as will be further looked upon after reliability, the correct decision was to remove these errors and not count them into the final analysis as these were inconclusive data.

To further enhance the reliability of the study, as mentioned in designing the questionnaire, look at previous research topics within the same category. Looking at previous studies helped select what type of questions was thought essential to gain a reliable conclusion to the study. However, a disadvantage of using an online survey could be if the questionnaire needs to cover more of what the researcher wants, or questions might be limited to what the participants want to answer. As a result, ending in a false result in what they actually wanted to reply (Cohen et al., 2018, p. 278). Therefore, a false result is something that the researcher has to consider when analysing the data.

3.5.2 Validity

The short and concrete explanation of validity is that “the validity of an instrument is the extent to which measures what is supposed measure” (Gideon, 2012, p. 399). “Validity is an important key to effective research. If a piece of research is invalid then it is worthless” (Cohen et al., 2018, p. 245). Harris (2016) mentioned that there are often three types of validity in a survey. These three are called construct validity, content validity and criterion validity. “Construct validity is where the measure is theoretically sound and correlates with the theorized construct, whereas content validity assesses the extent to which the items in an instrument are well defined and represent the given construct. The criterion validity describes the accuracy of if the test measures the outcome it was designed to” (Carmines & Zeller, 1979, as cited in Harris, 2016, p. 204). Only after the analysis of the research is done could the explanation of what Harris (2016) described on the three types of validity be done and say for sure that the research was valid enough.

Validity can also be divided into two groups, internal and external validity. As internal validity aims to demonstrate a set of data provided, external validity refers to which the results can be generalized to broader populations (Cohen et al., 2018, pp. 253-255). In this study, the proper validity to determine is internal validity. The teachers participating in this study’s research were from Bergen and Oslo municipalities. Knowing this as the

questionnaire was sent out to only schools from these municipalities, but how many from the two municipalities was unknown. The findings cannot generalize the teachers in these municipalities, nor can the finding generalize the teachers in Norway. These are personal answers given by the respective teachers, and every teacher has a different way of thinking and educating. Even if there was a probability of some data could be generalized through comparing to earlier research done, making assumptions that this comparable data could be seen in a bigger picture could harm the validity and reliability of this thesis.

4.0 Results and Findings

This part of the thesis will present the findings gathered from the questionnaire. The presented data will be organized by first looking at the quantitative data gathered. The quantitative findings will be presented in their respective category. These categories are *data with digital tools as the aim, students' digital literacy, English digital texts, teachers' professional digital skills and background questions*.

From the 46 teachers that participated in this study, as mentioned in the previous chapter, there were a total of 6 who did not complete the questionnaire. These participants answered no on the first question on whether they use digital tools in the classroom and/or did not answer the following questions the questionnaire. That is why these 6 participants were removed from the results. Thus, the data provided and shown, will only include the participants who completed the questionnaire, as the first question was an introduction to what the thesis wanted for data, as to whether they use digital tools in the classroom. The first question was given as digital tools is an essential part of this thesis as the research question asks about digital tools and multimodal texts.

The research question is stated again, as a precaution to giving an understanding of the data gathered.

- Are teachers able to use digital tools to develop a multimodal learning environment in the English classroom?

4.1 The descriptive quantitative data

This part of the thesis will showcase the data gathered from the quantitative part of the findings. The data will be divided into categories the questions from the questionnaire were aimed to target. These categories are digital tools and digital literacy, multimodal text usage and teachers' PDS. The quantitative findings will be presented in a bar-chart format, with the frequency and percentage numbers shown and written, to get the best possible look at the data gathered. Within the findings are several showcases of true zero point, where no participating teachers have answered either one or more of the alternatives given.

4.1.1 Data with digital tools as the aim

The first part of the questionnaire introduces the participants to digital tools, for which purpose they use digital tools, and how good their students' digital skills are. Question 1-4 covers the area of digital tools in the classroom, as well as for what purpose the teachers use digital tools in their English sessions.

The first question introduced to the participants in this questionnaire was, do you, as a teacher, use digital tools in your classes? On this question, all 40 (100 %) of the participants that completed the questionnaire said that they used digital tools, as shown in Figure 2. Some answered “no” to this question, but as these answers were part of the partially completed group, these answers were removed, as the rest of their answers were inconclusive.

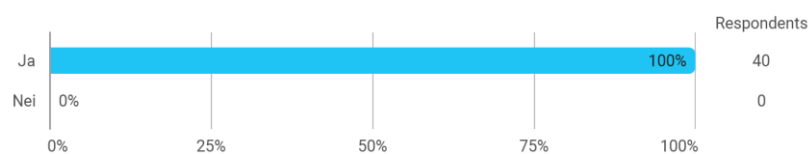


Figure 2. Do you as a teacher use digital tools in your school classes?

Question 2 asks about how often the participant as a teacher uses digital tools in their English sessions. Figure 3 shows that 11 (28 %) participants answered that they use digital tools every English session. In addition, 24 (60 %) of the teachers answered that they use digital tools often, while 5 (13 %) of the participants answered that they use digital tools sometimes. The last two categories, where 0 participants answered, are rarely or never. These answers show that out of the teachers that participated in this study, 88 % of 100 % use digital tools in their English sessions either often or more.

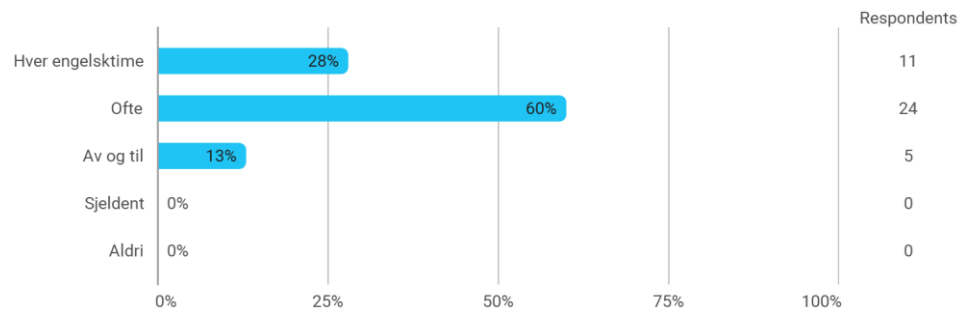


Figure 3. How often do you as a teacher use digital tools in your English sessions?

Question 3 and 4 from the questionnaire is about what teachers participating in the questionnaire use digital tools for in their English session. Both questions have the same answers that can be given, but question 3 was directed towards what teachers use digital tools for. Whereas question 4 was directed towards what purpose the teachers let their students use digital tools for in the teacher's English session. The answer choices for both these questions were *writing, reading, listening, oral skills, presentations, or other*.

Question 3, shown in Figure 4, was a multiple-choice question for the teachers, asking what purpose the teacher in question often uses digital tools for in their English sessions when teaching their students. As seen in Figure 3, 38 (95 %) of the teachers participating said they use digital tools when teaching writing skills. 32 (80 %) teachers said they use digital tools when teaching reading and listening skills, whereas 15 (35 %) said they use digital tools when teaching oral skills. Finally, 30 (75 %) teachers said they use digital tools when using presentations in their English sessions, while only 1 (3 %) teacher uses digital tools for a different purpose.

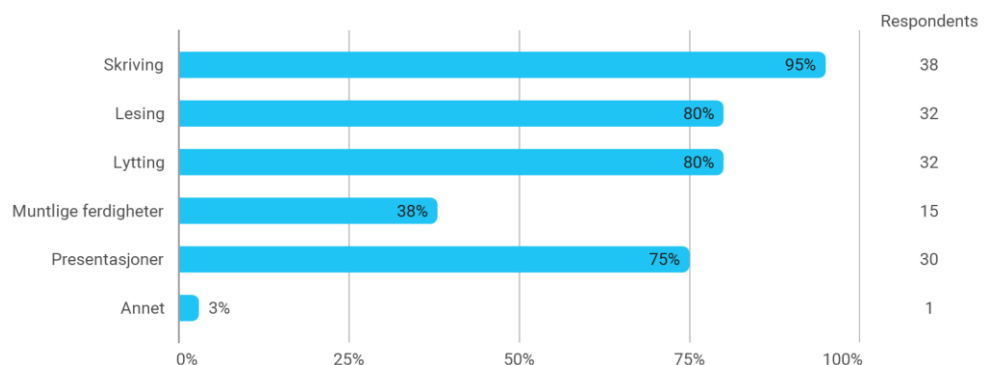


Figure 4. To what purpose do you as a teacher often use digital tools in your English sessions when you are teaching?

Question 4, another multiple-choice question, asks what purpose the teacher in question

allows their students to use digital tools in their English sessions. A total score of 40 (100 %) said they allow students to use digital tools when writing. 37 (93 %) teachers said they allow digital tools when students are reading, and 29 (73 %) said they allow digital tools when listening. In comparison, only 16 (40 %) said they allow students to use digital tools when practising oral skills. 36 (90 %) teachers said that they allow digital tools when students have presentations, while 1 (3 %) teacher allows the usage of digital tools when students are doing something else. The answers can be seen in Figure 5.

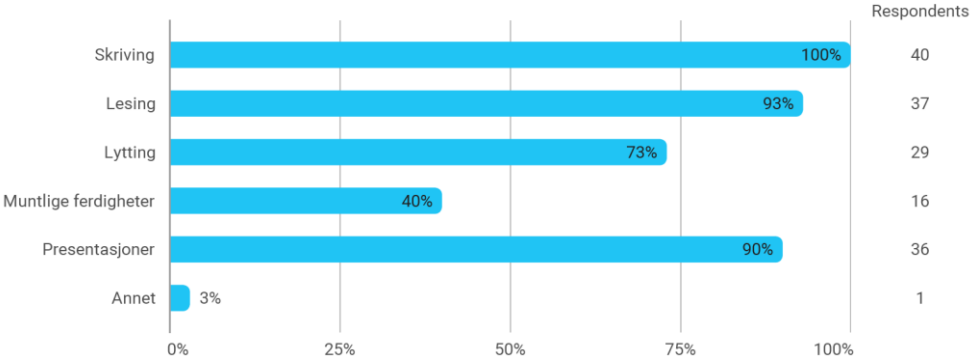


Figure 5. To what purpose do you as a teacher let your students use digital tools in your English sessions?

4.1.2 Students’ digital skills

Questions 5 and 6 in the questionnaire cover whether teachers think that students in their respective classes, in a general point of view, have digital competence and within which areas of digital competence the students know. These questions are represented as part of the Norwegian curriculum and thus a part of both teacher and student school day.

In question 5, 26 (65 %) teachers thought that their students generally have digital competence. While 14 (35 %) other teachers thought their students lacked digital competence, as seen in Figure 6.

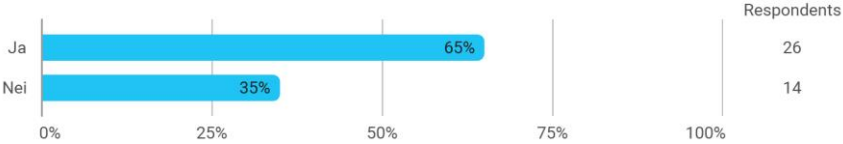


Figure 6. Do you feel that your students have digital competence? Within this are basic skills, downloading, searching, etc.

Question 6 was a multiple-choice question with a comprehensive list of choices that could be answered, covering skills contained in digital competence. Even though only some might get used in this thesis, the complete set of choices to answer was given. 31 (78 %) teachers

thought their students had *basic digital skills*. 19 (48 %) teachers thought that their students knew *how to download information*, and 19 (48 %) teachers thought that their students knew *how to search for information*. 12 (30 %) teachers thought that their students knew how to navigate *the digital network*, while 5 (13 %) teachers thought that their students could *organize and classify information*. In addition, 0 teachers think that their students can *compare and put together different types of information*. 2 (5 %) teachers think their students can *evaluate, check, and assess information*. 34 (85 %) teachers thought their students knew *how to communicate through digital tools*, while 28 (70 %) thought their students knew how to *cooperate with digital tools*. 37 (93 %) thought their students knew how to *create texts with digital tools*, while 14 (35 %) teachers thought their students knew how to *be creative using digital tools*. These numbers can be seen in Figure 7.

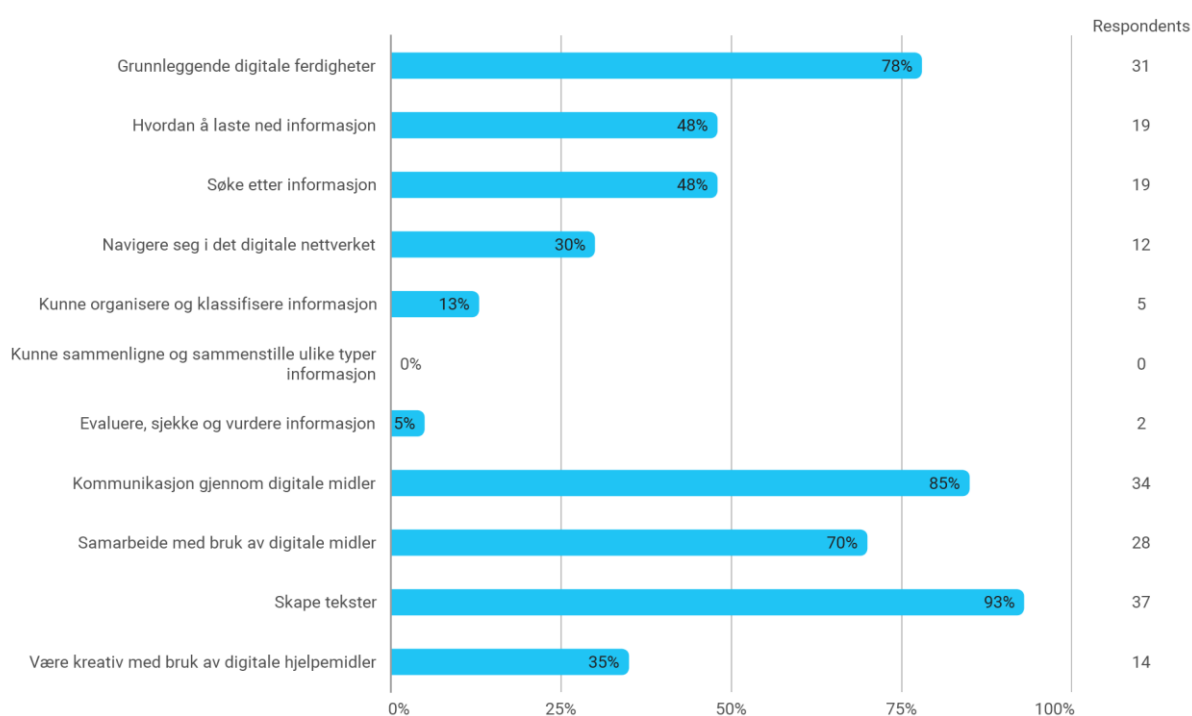


Figure 7. Which of these digital competence skills do you feel your students have competence in?

4.1.3 English digital texts

Questions 7-15 are the multimodal part of the questionnaire. These questions include the different kinds of digital text the teachers use or find for their students and what kind of texts they encourage their students to create. On whether the teacher encourages their students a variation in the way they produce their texts, or how much the teacher varies in the use of different digital tools when creating digital texts, as well as to what purpose the teacher

variates the digital tools. Questions 7-10 and 14 were multiple-choice questions, giving the participants the choice of more than one answer. Questions 11 and 12 were Likert-scale questions.

Question 7 asks what teachers use when creating English digital texts. 37 (93 %) of the teachers then answered that they use written texts when creating texts themselves, whereas 14 (35 %) teachers said they create digital sound texts. In addition, 33 (83 %) said they include pictures when creating texts, but 9 (23 %) answered that they create video texts. Finally, 3 (8 %) teachers answered that they did not create digital texts, and 1 (3 %) teacher said they used something else when creating digital texts..

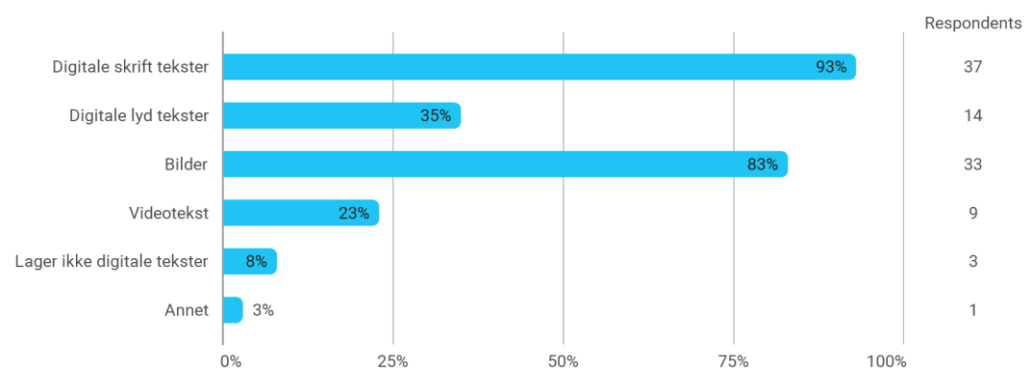


Figure 8. What do you use when you as a teacher create digital English texts?

Question 8 asks what teachers use when searching and finding digital English texts. The exact number of teachers, 37 (93 %), search and find digital written texts, but the number for sound, pictures, and video has increased. 35 (88 %) of the teachers search and find digital sound texts. 31 (78 %) teachers search and find pictures. 22 (55 %) teachers search and finds video texts, and 0 teachers search and find other types of texts, as shown in figure 9

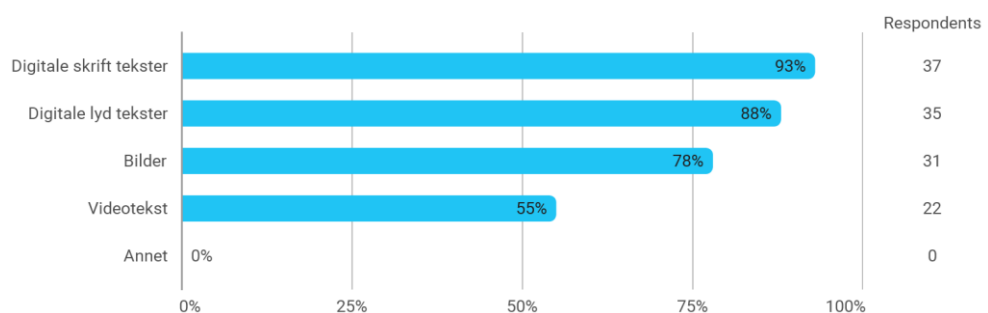


Figure 9. What do you as a teacher use when finding digital English texts?

Question 9, as shown in Figure 10, asks what the teachers encourage their students to use when creating digital English texts. A total score of 40 (100 %) teachers said they encourage

their students to use writing when creating texts. 20 (50 %) teachers said they encourage to use sound, while 26 (65 %) teachers said they encourage their students to use pictures when creating digital English texts. 18 (45 %) teachers said they encourage their students to create videos, while 2 (5 %) teachers said they encourage the inclusion of *other*.

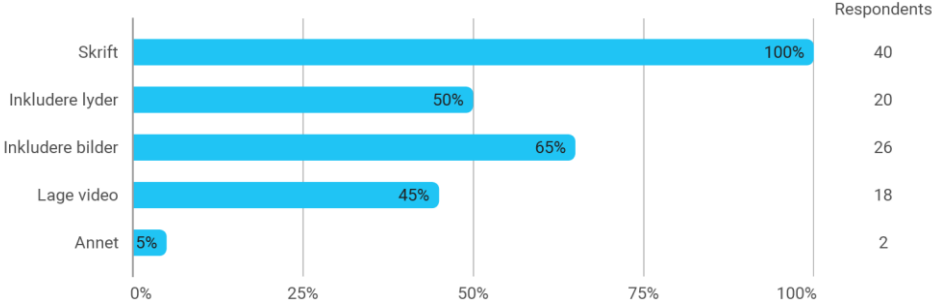


Figure 10. What do you encourage your students to use when they are creating digital English texts for themselves?

Question 10, shown in Figure 11, asked the teachers participating in the questionnaire if the teacher in question encouraged their students to vary how they produce English digital texts and for what purpose they encourage the variety. 32 (80 %) teachers said they encourage variety when the students work with tasks. 36 (90 %) teachers answered that they encourage variety when the students have presentations, while 15 (38 %) answered encouragements a variety of different kinds of productions. 32 (80 %) teachers said they encourage their students to variate their digital texts when they have submissions, and 0 (0 %) teachers answered *other*.

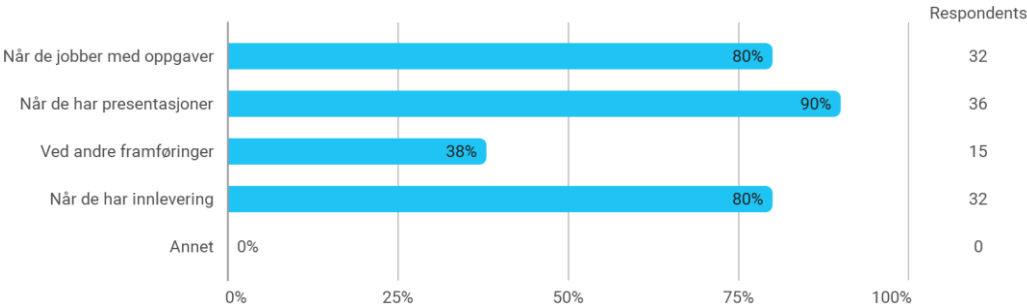


Figure 11. If you encourage your students to vary how they produce their English digital texts, to what purpose do you encourage them?

Question 11 asks about when teachers use digital tools to create or find digital tools, to which scale the teacher variates the use of different tools chosen in these texts. As to which 0 (0 %) teachers said they vary to every text. 11 (28 %) teachers said they vary often. 22 (55 %) teachers said they vary occasionally. 7 (18 %) teachers said they vary slightly, while 0 (0 %) teachers said they vary never.

teachers said they vary rarely. These numbers can be seen in Figure 12.

Question 12 then asks the teachers when they give their students tasks about creating English digital texts, in which scale the teacher varies the way the students create these texts. 0 (0 %) teachers said that they vary to every text the students create. 13 (33 %) answered they often vary, while 23 (58 %) said they vary occasionally. 4 (10 %) teachers said they vary slightly. 0 (0 %) teachers said they vary rarely. These numbers can also be seen in Figure 12.

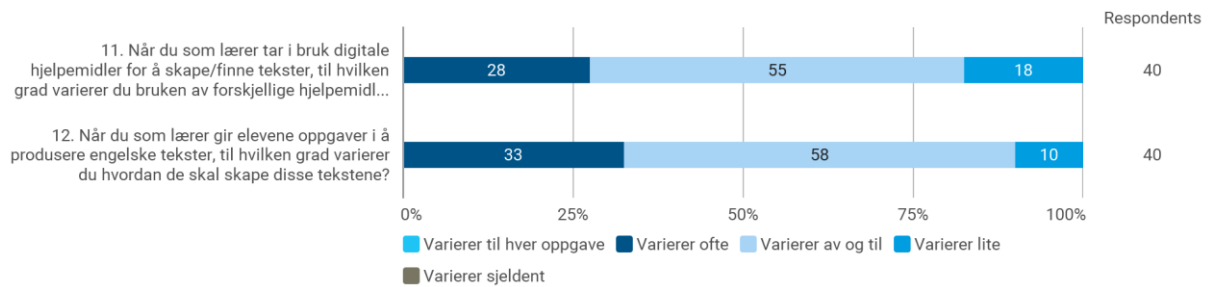


Figure 12. When you as a teacher use digital tools to create/find digital texts, in which scale do you vary the use of different digital tools? When you give your students tasks to produce English texts, to which scale do you vary how they create these texts?

Question 13 and 14 asks the participating teachers about the variety of different types of programs used outside of the ordinary digital writing book that students usually write in when doing tasks asked by the teacher. Question 13 asks if the teachers feel they encourage variation of different programs outside of the said digital writing book when the students are creating something in their English sessions. To make the participants think about other programs, some examples given to this question were Powerpoint, Creaza, video recorder, etc. Regarding this question, 28 (70 %) respondents encouraged variation. 7 (18 %) answered they did not, while 5 (13 %) respondents were unsure if they did encourage different programs.

These numbers can be seen in Figure 13

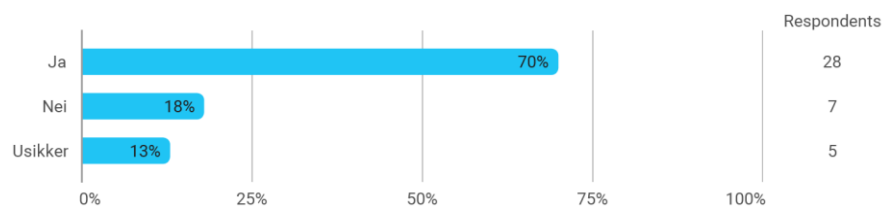


Figure 13. Do you feel that you as a teacher encourage variation different programs outside of the regular digital writing book (example Powerpoint, Creaza, video recorder, etc.) when your students are producing something in the English sessions?

Question 14 then redirects this encouragement of variation of different programs to what kind

of purpose the teacher in question encourages different programs. The teachers' answers were as follows: as seen in Figure 13, 21 (53 %) teachers said they encourage different programs in writing tasks. 11 (28 %) answered that they encourage programs in reading tasks. 33 (83 %) teachers encourage students to use different programs during presentations, and 28 (70 %) teachers encourage using different programs when making submissions. Finally, 4 (10 %) teachers said they encourage different types of programs for something else.

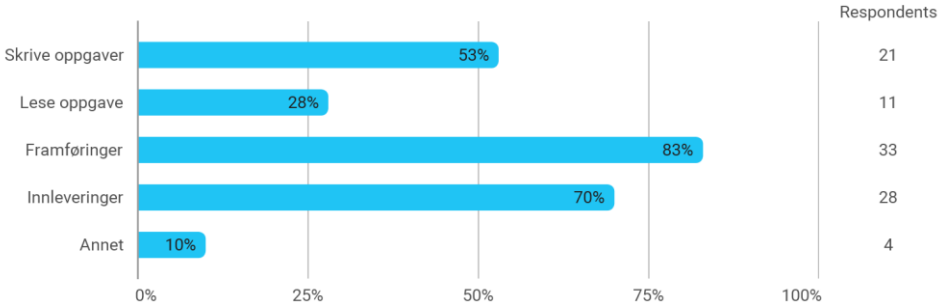


Figure 14. To what purpose do you encourage different programs?

4.1.4 Teachers professional digital skills

Questions 16-19 aim to get information about the teachers' professional digital skills. Whether the teachers feel they have gotten, in their opinion, a good enough training with digital skills, where this professional digital skills training has been done, and what part of the training or education about digital skills they feel are useful. Do they feel like they want to use this training in a classroom setting, or do they feel that it is something unreliable to use in the classroom?

Figure 15 shows the answer given to question 16. Where the teachers were asked if they felt they had had good enough training in professional digital skills (PDS). Of the 40 teachers that participated, 15 (38 %) of them answered yes, while the remaining 25 (63 %) answered that they felt a lack of professional digital skills.

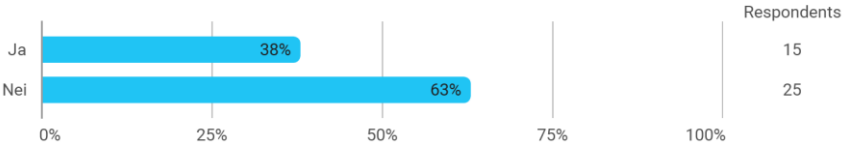


Figure 15. Do you as a teacher feel that you have a good enough training in PDS (professional digital skills)?

On question 17, seen in Figure 16, the teachers were asked where they had gotten their training with PDS. Question 17 was a multiple-choice question where the teachers could

answer more than one of the alternatives. 29 (73 %) of the teachers answered that they had gotten the training through the schools they worked at, exchanging ideas and techniques with other teachers and co-workers. 12 (30 %) teachers answered that they got training through courses and educational meetings directed by their school. 4 (10 %) teachers said they got their training through meetings that their school did not direct. 15 (38 %) teachers said they got their PDS training through their education. Furthermore, 34 (85 %) teachers said they got their PDS training from their own initiative.

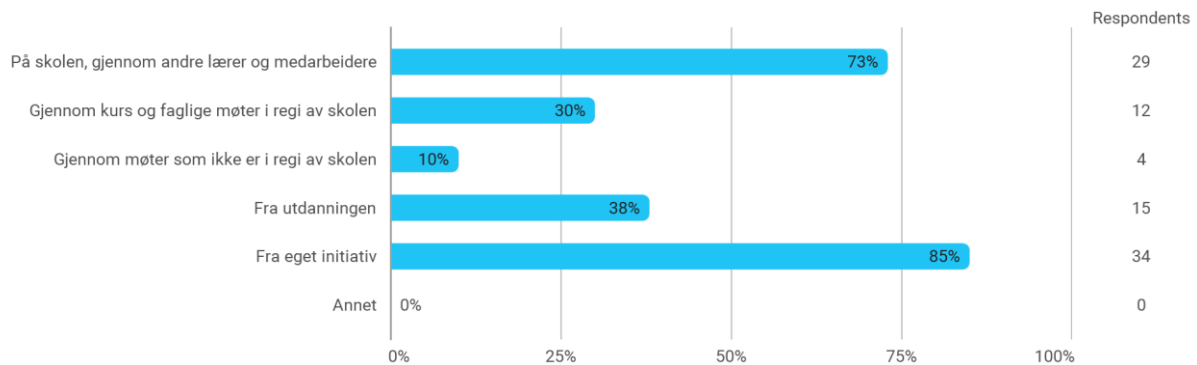


Figure 16. Where have you gotten your professional digital skills training?

Question 18 then further asks about what teachers felt was useful in their PDS training and education and if some parts of their training could be implemented into the teacher's classroom session. 0 (0 %) teachers answered that everything was useful. 14 (35 %) teachers answered that much of the PDS training was useful. 23 (58 %) teachers answered that some part of the training was useful. 3 (8 %) teachers said that a small part of the training was useful, while 0 (0 %) teachers answered that there was nothing useful with the training.

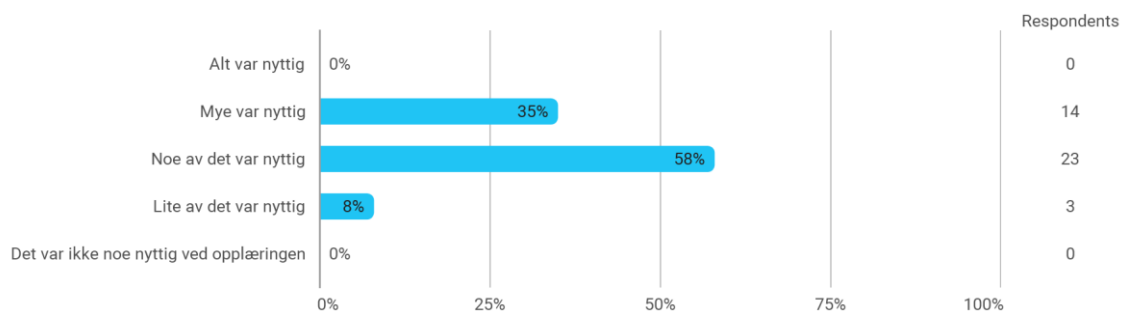


Figure 17. How big part of this training did you feel was useful and may use in your English sessions?

Question 19 then asks the teachers if there were some new digital tools that the teacher in question has been using or wishes to use the PDS training in their classroom sessions. 15 (38 %) teachers answered that there are new digital tools they want to make use of. 5 (13%)

teachers plan to use new digital tools. 7 (18 %) teachers said they needed more time to use something new. 3 (8 %) teachers said they did not have the opportunity to use any new digital tools. 7 (18 %) teachers said they need more digital knowledge before using the new digital tools learned through their training. 3 (8 %) teachers said there was nothing through their digital training they wished to use in their classroom sessions.

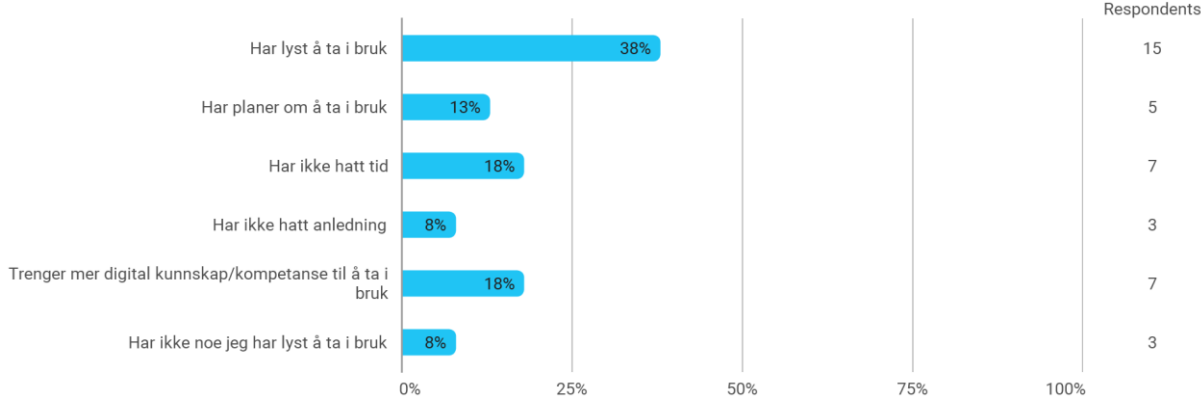


Figure 18. Through this training, did you find new digital tools that you have or wish to use in your English sessions.

4.1.5 Background questions

The final two questions in the questionnaire that are being inspected are *gender* and *how long the teacher has been working*. These questions are independent variables and could be cross-referenced to other data gathered from the questionnaire. This thesis's primary goal is not to look at the difference between gender and work. Instead, these questions are viewed as an indicator of where the teachers that have answered the questionnaire are. In both years worked as a teacher, and on the gender difference, the teachers answered the following.

Of these 40 participants, 11 (28 %) have been working as a teacher for between one to five years. On the other hand, 12 (30 %) of them have been working between six to ten years, 8 (20 %) of them have been working between eleven to fifteen years, and 9 (23 %) of the participating teachers have been working for sixteen years or longer, as shown in Figure 19. Seeing such a close gap between the percentage of years worked as a teacher from the participants was a pleasant surprise.

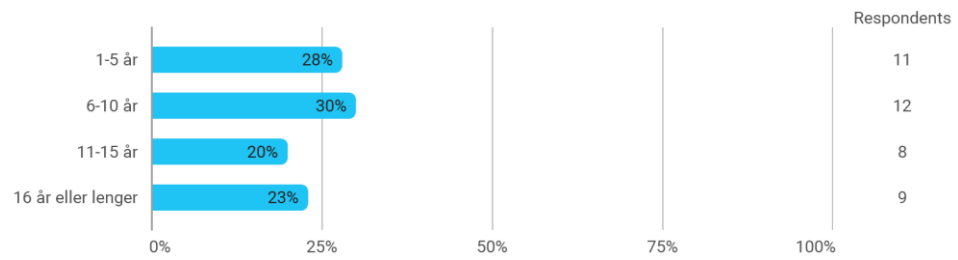


Figure 19. How long have you been working as a teacher?

Out of the 40 participants who finished the questionnaire, all were comfortable answering which gender they were. 24 (60 %) of the participants were female, and 16 (40 %) were male, as shown in Figure 20. 0 (0 %) teachers were answering the last two answers, which were other or did not want to answer.

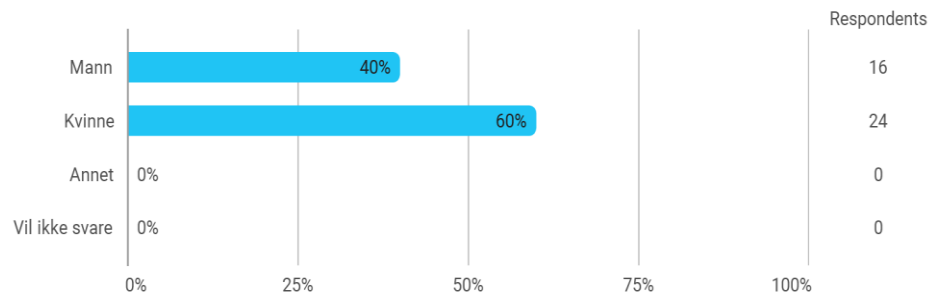


Figure 20. Which gender are you?

4.3 Qualitative data

Within the questionnaire, several questions were set up to gather qualitative data. These questions were Question 15, which was an open text answer where each participating teacher had to write an answer or questions with the alternative called *other*. On this alternative, there was an open textbox where the teachers participating in the survey could write other types of answers if they had something they wanted to add to other than the answers given to them. The qualitative data questions were analysed through Braun and Clarke's (2006) thematic analysis. Two main themes and three subcategories were concluded to work with on Question 15 and the alternative called *other*. Table 1 (under the text) presents these themes and subcategories.

Table 1. Main themes and subcategories for qualitative data

Main Theme	Subcategory
Multimodal texts	<ul style="list-style-type: none"> - Modes - Composed text. - Knows it is about communication.
Question categories with the answer choice «other»	<ul style="list-style-type: none"> - Digital tools - Digital texts - Digital programs

The theme “multimodal texts” for the participating teachers is one of the questions significantly impacting this thesis and its research question. Teachers need to know what a multimodal text is to develop a multimodal learning environment. However, even though multimodal texts have such an impact, it does not mean that the other data collected is less significant. On the contrary, they give a better insight into what teachers use digital tools, digital texts, and programs for in the teachers’ English sessions.

The qualitative data gathered from the qualitative part of the analysis will be presented in their own subchapter. In contrast, the discussion and result of the data will come in a later chapter.

4.2.1 Teachers knowledge about multimodal texts.

This chapter will present the data gathered from question 15 of the survey. Question 15 asked the teachers if they could define the term multimodal text. Within the data gathered from this question, each answer was selected into an answer category. These categories can be seen in Table 2, as well as the answer given by the participants. These answers were selected into different categories when crossed with the understanding of multimodality and multimodal text, which can be read in Chapter 2.2, Multimodal Text. The answers were given in Norwegian but have been translated into English. The answers given in the category of the teachers not giving a concrete answer will not be done anything with, as they were not ‘real’ answers.

Out of the 40 participating in the survey, 1 (2,5 %) teacher showed excellent knowledge of

multimodal texts. The teachers answered that “a multimodal text is a text where pictures/video can be used to convey information”. An answer like this was the only answer close to a textbook answer to what Kress (2010) explained about multimodal texts. The explanation of “different modes which are used as a way to communicate through a multimodal text, and examples of these can be text, image, layout, music, soundtrack, speech, moving image and 3D objects” (Kress, 2010, p. 79).

20 (50 %) teachers showed that they have a good knowledge of what they define multimodal texts as. In their explanation, they explained that a multimodal text contains different types of modes, as well as being a composed text. The only part these teachers needed to include was the part about how multimodal texts are also about communication. 13 (32,5 %) teachers showed that they have some knowledge about multimodal texts. These teachers’ answer was able to include that a multimodal text either uses different modes or is a composed text. 3 (7.5 %) teachers were either uncertain or had no knowledge of multimodal texts, whilst 3 (7.5 %) teachers gave an answer that was not sufficient, thus, could not be considered a suitable answer.

The answer given by the 40 teachers participating in the questionnaire can be seen in Table 2. Their answers have been translated from Norwegian to English as carefully and precise as possible to gain the most accurate translated answers. The answers have also been divided into the proper subcategories.

Table 2. Participants answer to question 15. Can you define the term multimodal text?

Question 15. Hva legger du i begrepet multimodal tekst? Can you define the term Multimodal text?				
Teachers that have three subcategories of a multimodal text	Teachers that have two subcategories of a multimodal text	Teachers that have one subcategory of a multimodal text.	Teachers that did not have knowledge about multimodal texts.	Teachers that did not give a concrete answer.
<ul style="list-style-type: none"> I would think of the term as a text where picture/video are also used to convey the content. 	<ul style="list-style-type: none"> A text where there are more elements, such as picture, text, textboxes, or other means. Text that includes picture, writing, sound, etc. A text that is combined by picture, sound, video, etc. A text that has more elements such as sound, picture, video in it Composite text combined with everything from writing, video, picture, sound etc. Composite text with example writing, picture, sound, video, etc. A text that includes sound, picture, illustrations, and written text Composite text with picture and writing. Can also contain sound. A text with more elements such as picture/sound A text with picture, video, audio. 	<ul style="list-style-type: none"> I guess it means digital composite text. The usage of more modes A composite text? Composite text Uncertain, but a text put together by several things? Composite text Composite text if I'm not wrong? Text with several modes Composite text Composite text Composite texts I think it means a composite text? Sound, film, writing, picture 	<ul style="list-style-type: none"> Do not know Uncertain Do not know 	<ul style="list-style-type: none"> Gfhj gdkf dkfgj

	<ul style="list-style-type: none"> • A text with picture and sound. • A text with several modes, such as picture or sound. • A text with picture or sound. • A text with picture or sound • Using several modes within a text. • Text with sound, picture. • Text with picture, sound or possibly video. • Texts with pictures and writing. • Texts with picture and writing. • Text with writing, picture and possibly sound. 			
--	--	--	--	--

4.2.2 Qualitative data gathered from the “other” answer choice.

As mentioned in earlier chapters, there was an answer choice called “other”. This choice contained an answer box where the participants could answer if they felt something was lacking from the choices in the questionnaire. The questions containing this alternative were Questions 3, 4, 7, 8, 9, 10, 14 and. Even though the questions contained the answer choice of “other”, it meant that the participants chose this alternative. The questions where the participants answered “other” were Questions 3, 4, 7, 9 and 14. Out of these, only one of them had text written. Even though the participant answering “other” was obligated to write in the box if the alternative was chosen, it ended in several questions with no text. Meaning that there either was an error in the creation of the questionnaire or the participants choosing the alternative other would only write a spacebar and go on to the next question. Such an occurrence happened on Questions 3, 4, 7 and 9. Receiving such an answer is a risk when

collecting qualitative data with a questionnaire and with these empty answers, leaving answers only on question 14 with written answers. The answers will be translated from Norwegian and showcased in English.

Question 14 qualitative data was a themed program. The question asked the teachers about the purpose of different programs outside the regular digital writing book their students often use. The quantitative data of this question can be read in subchapter 4.1.3. In this question, four teachers gave an answer written in the box on the alternative “other”, whereas one of the answers was blank on this as well. Without this blank answer, the theme gained two subcategories: games and other. These answers and subcategories can be seen in Table 4. Of the three teachers that answered with text on this alternative, two used gaming programs in their English sessions as a variation of the digital writing book. One teacher used programs for the purpose of different tasks not included in the answer alternative.

Table 3. Answers to answer choice “other” in question 14 To what purpose do you encourage different programs?

Question 14. Til hvilket formål oppfordrer du til forskjellige programmer? – To what purpose do you encourage different programs?	
Games	Other
<ul style="list-style-type: none"> • Games that are school related • Also using programs to games 	<ul style="list-style-type: none"> • Other possible tasks

5.0 Discussion

Teachers have a different views on how to operate within the classroom and in their English sessions, which relates to Borg's (2003) definition of teacher cognition. The teachers answered the questionnaire according to what they know, think, and believe. Borg (2015) mentioned a continuing surge of interest in researching language teacher cognition. To be a part of this interest, researching the teachers' approach to how they utilize digital tools and how they use multimodal texts within the digitalized classroom has created parts where discussions can be made. Within this chapter, the results of the findings will be further looked upon and discussed. This analysis will take a closer look and discuss teacher cognition to the three different categories that might influence the teachers' development of a multimodal environment. The categories that will be discussed are *Teachers' usage of digital tools*, with the subcategories: *What do teachers use digital tools for?* And *Teachers' views on their students' digital literacy, teachers' approach to multimodal texts and teachers' approach to professional digital skills*, as these categories co-relate to the categories mentioned in the theory part and the questions within the questionnaire mentioned in the findings. This discussion will try to fixate on what kind of impact the answers given by the teachers in the questionnaire might have on how teachers, in general, can develop Moreno and Mayer's (2007) definition of a multimodal learning environment. In this multimodal learning environment, the teachers use digital tools when either educating in the English classroom or when instructing their students on how to use digital tools when creating digital texts.

5.1 Teachers' usage of digital tools

This subchapter discusses the purpose for which teachers use digital tools in the classroom for their students' digital literacy. The findings show that all the teachers who completed the questionnaire used digital tools in their English sessions. However, there is a tendency regarding how often teachers use digital tools, as can be seen in Figure 3 in Chapter 4.1.1. According to Cohen et al. (2018), this question gained a true zero point. This true zero point occurs as no teacher answered rarely or never, which means that every participating teacher uses digital tools in their English sessions. The rapid growth of the digitalization of the Norwegian school system has just been increasing over the years after The Directorate implemented digital skills as a basic core skill in the curriculum. This implementation can be seen in both primary and secondary schools as teachers and students have access to digital

technology in both primary and secondary schools (Blikstad-Balas & Klette, 2020, p. 57). Such access to digital resources implies that the participating teachers need knowledge of how to operate different digital tools within different educational settings. This indicates that “the necessary skills, knowledge, creativity and attitude needed, and to be able to use digital media for learning and to master a knowledge society” is needed by every person in the classroom seeking knowledge and learning or educating. Basically, every person is trying to gain or give knowledge (ITU, 2005, p. 8).

5.1.2 What do teachers use digital tools for?

Digital tools have become a big part of today’s Norwegian classroom, and the educational plan by the Norwegian Directorate in 2006 implemented basic digital knowledge as one of the five basic skills needed in students’ education. This basic knowledge states that “digital skills in English is to use digital media and resources to enhance the language learning” (Utdanningsdirektoratet, 2020). However, for what purpose are the teachers using digital technology in the classroom in an educational setting? In the questionnaire, the teachers were asked for what purpose they use digital tools and for what purpose they let their students use digital tools in the English classroom. These questions asked were multiple-choice questions where teachers could answer more than one alternative, and the choices on both Question 3 and Question 4 were similar. The question answers can be seen in Figure 2 and Figure 3 in subchapter 4.1.1. Within these answers, there can be seen a similarity in the answers given in these two questions. The participating teachers use digital tools almost the same way as they let their students use digital tools in the English classroom. Such similarity is a promising finding, as this implies that according to the teachers participating in the research, both teacher and their students have digital skills to the extent that where they can use digital tools for each of these answers. According to the participating teachers, the primary way they use and let their students use digital tools is when writing.

Within Question 3 and Question 4 in the survey, there were two answer alternatives given by the participants, where the teachers stated that they used digital tools less than students. The first answer alternative was using digital tools for reading. Within this alternative, 13 % stated that they let their students use digital tools to read more than the teachers themselves do. The other answer alternative to these questions was presentations. Within this alternative, 15 % of the teachers stated they let their students use digital tools for presentation more than

themselves. These answers could imply that teachers might instruct their students to use digital tools to read or use presentations more than what the teachers themselves do. This can be due to the simple fact that teachers might not do as many tasks on digital tools on these two alternatives as they give to their students. By giving their students the chance to use digital tools follows The Directorate's skill area of *use and understand*. This skill area includes "being able to use and navigate digital resources inside and outside the network and safeguard information and data security" (Utdanningsdirektoratet, 2017, last edited 15.11.2017). The students use these digital resources, such as digital equipment, software, or digital measuring instruments, to convey messages using effects, images, sound, illustrations, and more. To be able to use these resources is critical if a teacher wants to develop a learning environment using multimodal texts.

Another alternative could be that some teachers have different creativity and/or attitudes to use digital tools to the same extent as what their students are capable of. Ending with them sticking to using digital tools the way they are comfortable with. If this is the case, the teachers feeling this way lacks some of the traits needed in digital literacy (Utdanningdirektoratet, 2020).

5.1.2 Teachers' views on their students' digital literacy.

Digital literacy is essential to this thesis research for both students and teachers. Since the term was first published in 1997 by Paul Gilster, where the term was to understand and use information in multiple formats from a wide range of sources when it is presented via computers (Gilster, 1997, 1, as cited in Secker, 2018, p. 5), the term has been redefined and adjusted to be able to use in an educational setting. The European Communities' definition states that digital literacy is "to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet" (European Communities, 2007, as cited in Ryberg & Georgsen, 2010, p. 89). The definition used in this thesis brought by the Research and expertise network for IT in Education (ITU) states that "digital literacy is skills, knowledge, creativity and attitudes that everyone needs, to be able to use digital media for learning and to master in a knowledge society" (ITU, 2005, p. 8). Furthermore, for the teachers to develop a multimodal learning environment with digital

tools, it indicates that not only the teachers would need digital literacy, but their students as well.

As part of teacher cognition, defined by Borg (2003), the participating teachers have their thoughts and beliefs about how well their students' digital literacy knowledge is. When such a big part of the Norwegian classroom is digitalised, it might raise some concern since 35 % of the participants feel that their students generally do not have the proper digital competence they need. Within the survey, 88 % of the participating teachers said they use digital tools every English session or often. When the participants were asked if they felt their students had digital competence, only 65 % answered yes. When digital tools are such a big part of the English classroom sessions, when 35 % of the teachers felt their students did not have digital competence, it might be of some concern. However, such a number does not necessarily mean that the teachers feel like their students do not have some knowledge of digital tools. The teachers' view of their students' digital literacy can be seen when looking at the answers in Figure 7 in subchapter 4.1.2, which are the answers teachers gave to Question 6. These answers show a wide variety of what the participants feel their students have knowledge of. The answers alternatives were *basic skills, download, search, navigation, classify, integrate, evaluate, communicate, cooperation and create/creativity*. These alternatives were selected as they are considered key components of digital literacy in the Norwegian curriculum. "The key components can form the structure to assess whether students and teachers are digitally competent" (ITU, 2005, p. 31). Creating this structure and gaining substantial knowledge within these components are equally crucial for both teachers and students, as digital literacy is a composed literacy. (ITU, 2005, p. 31). There could be a discussion around every digital skill within digital literacy and how to connect them in a classroom setting, but there are some that could be considered more critical for the creation of multimodal texts. The knowledge of *creating* digital texts is a critical point in this thesis. To develop a multimodal learning environment, the students need knowledge of how to create digital texts. As multimodal texts often include modes such as text, layout, and image (Kress, 2010, p. 79). If the teachers did not believe the students did not have the knowledge of how to create digital texts, the multimodal learning environment would be difficult, if not impossible, to develop. Thus, 93 % of the participants who thinks their students know how to create a digital text can be considered a good start when and if teachers want to develop a multimodal learning environment.

Another component with a score of 78 % of the participants feels the students have knowledge in and could be considered important within creating multimodal texts is the general basic skills. Basic skills are about opening software, sorting and storing information on a computer, and other simple skills when using computers and software. Each of these components is an essential aspect of the digital classroom. However, there are some that can be considered key components when developing a multimodal learning environment, per Moreno and Mayer's (2007) definition.

Communication through digital tools was a component which scored high on the list, with 85 % of the participating teachers feeling their students have knowledge of and may be considered a crucial part of multimodal texts. If a teacher wants to develop a multimodal learning environment, communication through digital tools will play a prominent role. As multimodal texts are not only written texts but can be done through communicational tools and shown as video, sound, or music (Kress, 2010. p. 79). Digital companies that can be used as communicational platforms, such as Facebook, Myspace, YouTube, and more, have, through Web 2.0, been given a chance to be used in the English classroom and with multimodal texts. (Jenkins, 2006, p. 179). Being able to communicate through digital tools could also be a big help if there is something the students might be stuck on, as digital tools and Web 2.0 have sped up the way we can communicate. Students today are growing up with smartphones and computers at quick disposal, making this a component that should, in theory, and after the survey was done, get a high score.

The component with the fourth highest score, 70 % of the participating teachers answered, was *cooperation through digital tools*. A component which can be considered a key element when developing a multimodal learning environment. This component includes "being able to create online learning relations with others and be able to make use of the digital technology for collaboration and participating in a network" (ITU, 2005, p. 31). Scoring high on this suggests that the students can work together in a digital classroom. A high score on this component makes the ability to create a digital learning environment, where students can work together with fellow students and their teachers through digital tools, an easier road. Quickly asking a fellow student, teacher or any other that could help them with a problem for a solution could get them quickly past any given problem they might face, creating a cooperative language learning environment in the English classroom. This digital literacy component also includes the student "to be able to express himself or herself through different

types of media” (ITU, 2005, p. 31). Moreover, this part of the component can be considered the key part of multimodality, as multimodal texts are about how to communicate using different modes. The chosen digital media can be considered a mode when used as a communication tool to express a message. This part of the component also fits into Kress et al. (2001) second point of multimodal communication. As Kress et al. (2001) second point is explained “as the meanings made with language, whether as speech or as writing. When speech or writing are interwoven with the meanings made with other modes in the communicative context, this interaction produces meaning itself.”(p.) As such, for the students to be able to communicate through digital media and combining different digital modes such as video, sound, music, and more can be considered a good start when wanting to develop Moreno and Mayer’s (2007) definition of a multimodal learning environment.

One of the components of digital literacy, which was also specified in subchapter 2.1, was *to be able to compare and put together different types of information*. This answer choice is called integrate. Integrating digital texts is when a student is able to compare the information they gain and put this information into a merged text (ITU, 2005, p. 31). None of the teachers who participated felt their students had knowledge of this alternative. This answer choice was specified earlier as what the Norwegian Directorate classify as multimodality and multimodal texts. Multimodality is more than what could be specified with this point, as seen in the thesis. Nonetheless, it still raises a concern that not one teacher thought their students had knowledge within this point. The participating teachers may not know what this question means or that it was related to multimodality and therefore did not want to pick an answer they were unsure of.

Nevertheless, suppose this was not the point, and every teacher did not think their students could combine information into a merged text. In that case, the capability of creating a multimodal environment might be close to impossible. Larson and Marsh (2005) explain how teachers are a contributor to the student’s learning in the complex multimodal digital world through three different roles. This is mentioned in subchapter 2.3.2, where these different roles include “teachers as a resource manager, teacher as a co-creator and teacher as a design consultant” (Larson & Marsh, 2005, as cited in Dons 2006, p. 63). This would mean that the teacher has the responsibility of maintaining these three different roles. In this incident, where the teachers do not think the students have knowledge about multimodality means that the roles brought by Larson and Marsh (2005) of resource manager and design

consultant come with a heavy responsibility. Within these roles, “the teachers need as a resource manager to support the students’ developing skills, knowledge and understanding to analysis and produce multimodal texts and need to, as a design consultant give educational feedback on the product and design” (Larson & Marsh, 2005, as cited in Dons, 2006, p. 63). The teacher's support is the only way the students might fulfil the role of a co-constructor of knowledge, where the teacher and students might be able to learn from each other. An environment where both teacher and student are fulfilling the roles of Larson and Marsh's (2005) complex multimodal digital world is where the teachers want to be so that the students and the entire classroom would turn into a proper multimodal learning environment. (Dons, 2006, p. 63)

5.2 Teachers’ approach to digital multimodal texts.

Throughout the questionnaire, there were several questions regarding multimodal texts. These questions were created to investigate Kress's (2010) points on what kind of different modes the participating teachers and their students use when communicating through English digital texts (mentioned in chapter 2.2.1). The teachers that participated in the questionnaire have shown that digital texts are a big part of their digital tool repertoire. Throughout the questions of multimodality, the participating teachers have shown a difference in what purpose they are using digital texts and are a part of Borg's (2003) definition of teacher cognition, as every teacher has a different opinion and belief to what they feel are essential. The teachers have also shown what modes are used when creating and finding texts, compared to the encouragement they give their students on what mode to use in digital texts.

The first part of the multimodal category in the questionnaire contained three questions about digital texts and what modes teachers use. These three questions had the same answer choices but three different angles. The first question asked the teachers what mode they use when creating digital texts. The second question asked the teachers what mode they use when they search and find digital texts. The third question asked what the teacher encourages when they let their students create digital texts. The research findings showed that teachers often create texts with written text and/or pictures, as shown in Figure 7 in Subchapter 4.1.3. Changing the question to where the teachers encourage their students to create digital texts, the usage of different modes changes, as shown in Figure 9. A slight change in the usage of different modes could be considered, as 36 out of the 40 participants have shown some or more

knowledge about what the term multimodal text includes. When comparing what the teacher creates and what the teacher encourages the students, using a picture as a mode when creating a digital text drops by almost 20 %. Such a number is a considerable drop if the teachers want to develop Moreno and Mayer's (2007) definition of a multimodal learning environment, as the teachers should be encouraging the students to use more modes in their digital texts. Although, more teachers are encouraging other modes, such as video or sound, compared to what the teachers themselves use.

A change like this might suggest that some teachers feel that digital tools can be used as a way for their students to express themselves and make it easier to communicate (Lambert, 2012, as cited in Aagaard, 2014, p. 194). The case of teachers that would instead utilise the digital tools available to let their students create multimodal texts to express themselves, rather than creating multimodal texts themselves and express this text for their students, could have both positive and negative sides. The positive is that the teachers encourage their students as resource managers, giving them opportunities to communicate how they want. By giving the opportunity to communicate through digital texts, follows The Directorate's *Communicate and interact* skill area. Where it is defined as "being able to use digital resources for communication and interaction. Digital interaction involves the use of digital resources for planning, organizing and carrying out learning work together with others" (Utdanningsdirektoratet, 2017, last edited 15.11.2017). Using different modes in digital texts also includes the skill areas from Utdanningsdirektoratet (2017) *find, process, produce, and treat*. In addition, the teacher includes the process of acquiring, interpreting and assessing information from digital sources when encouraging the use of different modes when creating digital texts, giving the students creativity when creating these texts.

The negative side could be that the teachers might lose or need more knowledge to be part of the co-construction and design consultant job if they do not try to use the same modes they are encouraging their students to use. "The teacher does not need to be an expert on multimodal texts, but has the knowledge about the education and the educational plan" (Larson & Marsh, 2005, as cited in Dons, 2006, p. 63). As for the students, creating texts are ways for them to communicate, and creating an environment where the students can communicate the way they want, might be an opportunity to enhance the students learning. The students might be able to create their own strategies when creating digital texts, through what mode they prefer to use. Furthermore, as a teacher, encouraging their students to be creative in which way they communicate could play a significant part in developing a multimodal learning environment.

Multimodal texts have exceeded levels above what could be imagined over the years. Teachers must embrace what the digital world has to offer and encourage their students to use whichever mode so that they can express and communicate how they truly want through digital text (Kress 2010, as cited in Molin & Godhe, 2020, p. 154).

However, there is a difference in modes used when teachers create their own digital texts compared to when they find digital texts. When teachers find digital texts, they tend to embrace other modes in these texts. This embrace can be seen in Figure 8 in Subchapter 4.1.3. The findings show an increase in teachers using sound and video texts. There could be some reasons why this is. It could be a possibility that teachers feel they need more time and energy to create their own texts. Moreover, when they include modes, they keep the text simple, with modes such as pictures and writing. Another possibility is that teachers feel that the texts and resources they can find on the internet are better than what they can produce themselves. Knowing that Web 2.0 has enhanced multimodal texts, it is a possibility that teachers create fewer digital texts themselves and would instead find these digital texts through other resource sites. (Jenkins, 2006, as cited in Moling and Godhe, 2020, p. 153)

The second part of the quantitative multimodal data in the questionnaire was the variation of digital tools used when either the teachers or their students create digital texts. The participating teachers gave the impression that they tend to vary the use of different digital tools when the teachers are creating or finding digital texts. However, teachers vary how they use digital tools more when their students create digital texts than when the teachers themselves create or find digital texts. The variation of digital texts indicates that teachers encourage their students to differ in how they create digital texts. Furthermore, with the digital world and the interactive features of Web 2.0, the digital access to create multimodal texts have enhanced (Jenkins, 2006, as cited in Molin & Godhe, 2020, p. 153). Therefore, using various tools may help the students find what enables them to find which digital tool they feel they can get the best way to communicate through texts creation.

The participating teachers also tends to vary in the different types of programs used when their students should produce something in their English sessions. The different types of programs used could be considered a part of the channels mentioned by Xiao et al. (2020), where these channels promote the usage of different modes. The participating teachers tends to differ on when they encourage the usage of different program, where two teachers even encouraged learning games in their English session. Promoting and encouraging the usage of

different programs might allow the students to easier engage and represent the content verbal and non-verbal, and as such starting to develop Moreno and Mayer's (2007) definition of a multimodal learning environment, and through this environment, as Fletcher and Tobias (2005) mentioned in Moreno and Mayer (2007), might enhance the student's understanding of the content by using the different modes given by Kress (2010).

Through what the teachers responded on question 15 in the questionnaire, there can be seen a variety of knowledge about what a multimodal text is. Most teachers that participated in the survey have some knowledge or understood what a multimodal text was. 34 out of 40 participating teachers had either some or excellent knowledge about what a multimodal text concluded. These 34 teachers showed knowledge with points provided by Kress (2010) about creating a text with combining different modes. With this knowledge the teachers might be able to contribute with their students' learning environment. By encouraging their students to create multimodal texts, the teachers gain the job as a resource manager, a co-constructor, and a design consultant, and following these jobs might create, or start to create, a multimodal learning environment (Larson & Marsh, 2005, as cited in Dons, 2006, p. 63). However, even if the teachers have knowledge about what a multimodal text is, does not necessarily mean that they use it in the classroom or know how to implement it into a proper learning environment. And as Molin and Godhe (2020) mentioned, the capabilities of creating multimodal texts have exceeded to a new level when the digital classroom arrived. The imagination of what students are capable of creating when using digital tools when teachers are helping them, is a classroom worth watching. It is the teacher's responsibility to have the capable knowledge to back up on these three jobs. For teachers to be able to do this, would mean that teachers need the knowledge about multimodal texts and how to operate and educate with these texts in the digital classroom.

5.3 Teachers approach to Professional digital skills.

The last approach to the discussion part, the thesis, will examine how the participating teachers feel about their professional digital skills. There has been researched on PDS for teachers in Norway before, such as Røkenes study from 2013 provided by Røkenes (2016), OECD's international study (TALIS) from 2018, and Blikstad-Balas and Klette study (2020). These studies will contribute to see if there is a difference between prior studies and the teachers that participated in this study. For teachers to be able to utilise the digital tools

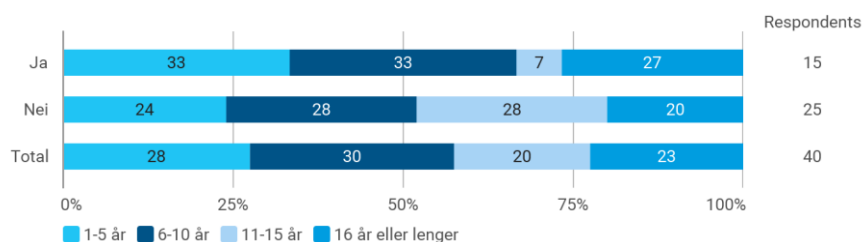
available in their English classroom to create digital texts, teachers would need the knowledge on how to use the proper digital tools and to be able to utilise the tools in a way that strengthens their student's language learning. Knowledge of professional digital skills is about utilising these digital tools to strengthen the student's language learning (Utdanningsdirektoratet, 2020).

In the data gathered from the participants about their professional digital skills, there is a clear connection to the Norwegian teachers in OECD's international study of teachers in 2018, that were mentioned in 2.1.1. Blikstad-Balas and Klette's (2020) study concluded that one out of five teachers feel they do not have enough knowledge of PDS. In this survey, 63% of the participants answered that they did not feel they had obtained good enough training in PDS, as can be seen in Figure 14 in Subchapter 4.1.4. The answer from the teachers could indicate that throughout the years after these two studies were done, PDS education for teachers could still be lacking. The lack of PDS has been an ongoing problem, where Norwegian teaching education has been behind in integrating and using information- and communication technologies (ICT) (Røkenes, 2016, p. 49). Even though this number represents a small portion of the population of teachers in Norway, it still indicates that the number of teachers lacking proper education within PDS could still remain in the Norwegian school system.

The number of teachers answering yes on if they felt like they had obtained a good enough education or training with PDS was 15 participants out of 40. Figure 21, visioned under the paragraph, shows that out of these 15 participants, 33% are teachers that have been working between 1-5 years, whilst 33% are teachers working between 6-10 years. Meaning that 66% of the teachers that answered yes have been working for ten or fewer years. This number of participants could specify that the educational system for PDS in teacher education might have improved after the studies done, given by Røkenes (2016) and Blikstad-Balas and Klette (2020). The implication of a five-year master's education for teachers in 2017 might have improved the education of PDS (Utdanningsforbundet, last edited 26.02.2021). Looking further into the numbers, 15 respondents answered that they got their PDS training through their teacher education leaves this implication back to the point done in the mentioned studies. On the contrary, seeing that there is 63 % participation answered that they do not have good enough training within PDS could suggest some possibilities. One possibility could be that teachers' training is still lacking, as it has been since 2018 (Blikstad-Balas & Klette, 2020, p. 57)

Another possibility is that the digital world is moving too rapidly for the teachers to follow, thus feeling that they need to catch up. As Røkenes mentioned in his study from 2013, mentioned in Subchapter 2.1.1, where Norwegian teaching education was behind in integrating and using ICT, it could still be a possibility in today's school system (Røkenes, 2016, p. 49). The digital world is always in the creation and being further improved upon, and thus it can be just as hard to implement today's technology as it has been in prior years. This can be found when looking at Figure 21, where out of most of the teachers answering yes on good enough PDS, only 45% of the teachers that have worked between 1-5 years felt that their PDS training came from their education. These numbers found within the research further enhance Blikstad-Balas and Klette's (2020) point about teachers lacking PDS in their study even greater. The findings indicate that the improvement of further professional development does not change for newly qualified teachers. The most common way to get training within PDS between all age groups is from their own initiative. This can be seen as both good and bad, as teachers care enough to take the initiative and learn PDS on their own accord. However, it can also be wrong, as teachers must use their own personal time on something that should be implemented by their school or in their education to the degree that they should not need to use their free time on learning.

Teachers who feel like they lack the proper skills to be able to operate educationally in the digital classroom could make it harder for teachers to be able to develop Moreno and Mayer's (2007) definition of a multimodal learning environment by using digital tools and the different digital channels available, given by Xiao et al. (2020). Technologies are changing, and teachers need help to be able to follow this change. Teachers cannot be expected to use their own free time out of work to be able to learn and adjust to these changes. However, it is the teacher's responsibility to try to learn when there is an opportunity to do so when they are at work. To gain the possibility to learn, the respective schools where the teachers work and the teacher education need to update or adjust the PDS education, which has been behind for many years.



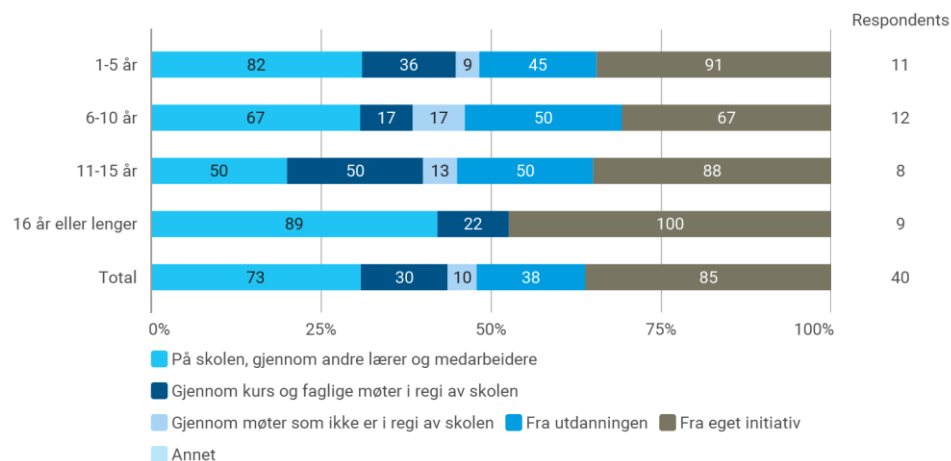


Figure 21. Demographic background on the teachers' approach to professional digital skills.

6.0 Conclusion

The purpose of this study was to look into how 8-10th grade teachers in Norway operate digital tools and their knowledge and how they use these tools in a multimodal purpose within the English classroom. The research contained anonymous teachers from both Bergen and Oslo municipalities. Within this process, the participating teachers have shown that operating with some sort of digital tools in the English classroom is a necessity. Every teacher participating in this research used digital tools in their English sessions, some more frequently than others. The goal of the research was to see if teachers are able to achieve a multimodal learning environment, as defined by Moreno and Mayer (2007) while using the digital tools within their reach.

In conclusion, after analysis, the findings provided valuable insight into the use of digital tools in English language teaching in Norway. When the Norwegian Directorate in 2006 implemented basic digital knowledge as one of the students' five basic skills, teachers' potential to promote multimodal learning through the use of digital tools grew exponentially. The participating teachers were asked for what purpose they use digital tools and what purpose they let their students use them in the English classroom, and the results showed that according to the teachers, both teachers and students mainly use digital tools when writing. There were also some cases where teachers instructed their students to use digital tools for reading or presentations more than they used themselves. With allowing the students to use digital tools in the English sessions, allows them to gain experience and learning in the skill

areas provided by Utdanningsdirektoratet (2017). Instructions on the variety of purposes when using digital tools in the English classroom further enhance the potential to promote multimodal learning. Even though 88 % of the teachers used digital tools every English session or often, the teachers had a mixed view of their students' digital literacy. 35 % of the participating teacher thought their students did not have sufficient digital literacy. This could raise concerns if a teacher wants to develop a multimodal learning environment using digital tools. If the students are not able to reciprocate the demands that the teachers are creating with digital tools, it might slow down the development of multimodal learning. However, there were some components within digital literacy that teachers, to a certain point, agreed their students had knowledge about. The components *of how to create a digital text, general basic skills, communication through digital tools and cooperation through digital tools* where the teachers thought their students were competent are considered necessary in multimodal learning. If the teachers are correct in their assumption of their students' knowledge of these components, it means they have an advantage when trying to promote and enhance multimodal learning. Integration was one point within digital literacy that not one teacher felt their students had knowledge about. Integration, where comparing and putting information into a merged text, could be considered essential and crucial when developing a multimodal learning environment.

The concept of multimodality and multimodal text was familiar to the participating teacher, as nearly every teacher had some knowledge about what a multimodal text contained. Through the first multimodal part of the questionnaire, the participating teacher gave answers on what modes to use when creating or finding digital texts. The teachers tend to use written text and/or pictures when creating digital English texts but tend to use more modes when finding English digital texts. The teachers also tend to encourage their students to use more modes when creating digital English texts. Encouraging their students could be the teachers' way of letting their students express and communicate in their own way, which lets the students learn several of the different skill areas provided by Utdanningsdirektoratet (2017), such as *find and process, produce and treat, and communicate and interact*. Communication is a key part of Kress's (2010) definition of multimodality. This communication can be used in the teacher's three jobs as a contributor in the complex multimodal environment, as explained by Larson and Marsh (2005) as mentioned in Dons (2006). These jobs are explained as a resource manager through encouraging different modes when the students are creating digital texts, a co-creator when helping the students' creation of the actual texts, and a design consultant

when giving feedback on the students' digitally created text. Although this approach has its positive side, the negative aspect is that the teachers might lose or lack the knowledge to be the co-construction and design consultant if they do not try to use the same modes as they are encouraging their students to use. The second multimodal part of the questionnaire found that teachers vary in how they use digital tools and programs when their students are creating texts, indicating that teachers are encouraging their students to differ in the way they create digital texts. Overall embracing what the digital world has to offer and encouraging students to express and communicate the way they want through digital text can be a significant part of developing a multimodal environment.

To handle the digitalised classroom and help further improve the students' language learning, teachers would need sufficient knowledge about how to use the digital tools available in a pedagogical way. In the prior years, through different studies, teachers in Norway have felt a lack of knowledge in professional digital skills. The research found that there is still a lack of professional digital skills. A connection can be drawn between the participating teachers' perception of their PDS knowledge and the quality of PDS education through the prior studies, with 63 % of the teachers participating answering that they did not feel they had obtained sufficient training in PDS. Of the 37 % who felt sufficient in PDS, 2/3 had worked ten years or less. Such a number might show some indications of improvement, such as the five-year master's education for teachers in 2017. The findings suggest that the education system for PDS needs further improvement. Looking at the participating teachers and where they obtained their PDS knowledge, the most common way to obtain this knowledge is through the teachers' own initiative. With the technology constantly improving, so should the teachers' PDS education. While it is the responsibility of the schools and teacher education to provide adequate training, teachers must also take the initiative to learn. Without proper PDS knowledge, the development of a multimodal learning environment using digital tools pedagogically might be slowed down.

To summarise, the study aimed to investigate how digital tools are used in English language teaching in Norway and whether teachers are able to create a multimodal learning environment through their use. The study found that digital tools are necessary for English language teaching, and teachers generally understand multimodal texts well. However, there is a concern with the teachers' perspective over some students' digital literacy skills, particularly in terms of integration, which could slow down the development of a multimodal learning environment. Teachers tend to use a variety of modes when creating and finding

digital texts and encourage their students to do the same. There is also a need for improved professional digital skills education for teachers to use digital tools pedagogically and effectively.

Reference list

Aagaard, T. (2014). Teachers' Approaches to Digital Stories—Tensions Between New Genres and Established Assessment Criteria. *Nordic Journal of Digital Literacy*, 9(3), 194–215.

<https://doi.org/10.18261/ISSN1891-943X-2014-03-03>

Anderson, G., Anderson, G. J., & Arsenault, N. (1998). *Fundamentals of Educational Research*. Psychology Press.

Biesta, G. (2002). Bildung and Modernity: The Future of Bildung in a World of Difference. *Studies in Philosophy and Education*, 21(4), 343–351.

<https://doi.org/10.1023/A:1019874106870>

Blikstad-Balas, M. (2016a). Faglig og ikke-faglig bruk av teknologi i klasserommet. In R. J. Krumsvik (Ed.), *Digital læring i skole og lærerutdanning* (2. utg., pp. 136–150).

Universitetsforlaget.

Blikstad-Balas, M. (2016b). Literacy i skolen. In *NFFO*. Universitetsforl.

https://urn.nb.no/URN:NBN:no-nb_digibok_2020081948523

Blikstad-Balas, M., & Klette, K. (2020). Still a long way to go. *Nordic Journal of Digital Literacy*, 15(1), 55–68. <https://doi.org/10.18261/issn.1891-943x-2020-01-05>

Borg, S. (2003). Teacher cognition in language teaching: A review of research on what language teachers think, know, believe, and do. *Language Teaching*, 36(2), 81–109.

<https://doi.org/10.1017/S0261444803001903>

Borg, S. (2015). *Teacher Cognition and Language Education: Research and Practice*.

Bloomsbury Publishing Plc. <http://ebookcentral.proquest.com/lib/hogskbergen-ebooks/detail.action?docID=1938192>

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. In *Qualitative research in psychology*. (Vol. 3). Arnold. <https://doi.org/10.1191/1478088706qp063oa>

Buckingham, D. (2015). Defining digital literacy—What do young people need to know about digital media? *Nordic Journal of Digital Literacy*, 10(Jubileumsnummer), 21–35.

<https://doi.org/10.18261/ISSN1891-943X-2015-Jubileumsnummer-03>

Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education*. Taylor & Francis Group. <http://ebookcentral.proquest.com/lib/hogskbergen-ebooks/detail.action?docID=5103697>

de Saint-Georges, I. (2013). Multilingualism, Multimodality and the Future of Education Research. In I. de Saint-Georges & J.-J. Weber (Eds.), *Multilingualism and Multimodality: Current Challenges for Educational Studies* (1st ed., Vol. 2, pp. 1–8). <http://ebookcentral.proquest.com/lib/hogskbergen-ebooks/detail.action?docID=3034865>

Dons, C. F. (2006). Digital kompetanse som literacy? – Refleksjoner over ungdomsskolelevers multimodale tekster. *Nordic Journal of Digital Literacy*, 1(1), 58–73. <https://doi.org/10.18261/ISSN1891-943X-2006-01-06>

Dörnyei, Z., & Taguchi, T. (2009). *Questionnaires in Second Language Research: Construction, Administration, and Processing*. Taylor & Francis Group. <http://ebookcentral.proquest.com/lib/hogskbergen-ebooks/detail.action?docID=465410>

Furberg, A., & Lund, A. (2016). En profesjonsfaglig digitalt kompetent lærer? : Muligheter og utfordringer i teknologirike læringsomgivelser. In R. J. Krumsvik (Ed.), *Digital læring i skole og lærerutdanning* (2. utg., pp. 26–48). Universitetsforlaget.

Gideon, L. (2012). *Handbook of Survey Methodology for the Social Sciences*. Springer New York. <http://ebookcentral.proquest.com/lib/hogskbergen-ebooks/detail.action?docID=971668>

Harris, M. J. (2016). *Evaluating Public and Community Health Programs*. John Wiley & Sons, Incorporated. <http://ebookcentral.proquest.com/lib/hogskbergen-ebooks/detail.action?docID=7104457>

ITU. (2005). *Digital skole hver dag—Om helhetlig utvikling av digital kompetanse i grunnopplæringen*. <https://www.udir.no/tall-og-forskning/finn-forskning/rapporter/Digital-skole-hver-dag-2005/>

Jenkins, H. (2006). *Convergence Culture: Where Old and New Media Collide*. New York University Press. <http://ebookcentral.proquest.com/lib/hogskbergen-ebooks/detail.action?docID=2081610>

Jewitt, C. (2008). Multimodality and Literacy in School Classrooms. *Review of Research in*

Education, 32, 241–267.

Jewitt, C. (2013). Multimodality and Digital Technologies in the Classroom. In J.-J. Weber & I. de Saint-Georges (Eds.), *Multilingualism and Multimodality: Current Challenges for Educational Studies* (1st ed., Vol. 2, pp. 141–151). BRILL.

<http://ebookcentral.proquest.com/lib/hogskbergen-ebooks/detail.action?docID=3034865>

Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. Routledge.

Kress, G., Jewitt, C., Ogborn, J., Charalampos, T., & Tsatsarelis, C. (2001). *Multimodal Teaching and Learning: The Rhetorics of the Science Classroom*. Bloomsbury Publishing Plc.

<http://ebookcentral.proquest.com/lib/hogskbergen-ebooks/detail.action?docID=435983>

Krumsvik, R. J., Jones, L. Ø., Øfstegaard, M., & Eikeland, O. J. (2016). Upper Secondary School Teachers' Digital Competence: Analysed by Demographic, Personal and Professional Characteristics. *Nordic Journal of Digital Literacy*, 11(3), 143–164.

<https://doi.org/10.18261/issn.1891-943x-2016-03-02>

Molin, L., & Godhe, A.-L. (2020). Students' critical analyses of prominent perspectives in a digital multimodal text. *Nordic Journal of Digital Literacy*, 15(3), 153–164.

<https://doi.org/10.18261/issn.1891-943x-2020-03-02>

Moreno, R., & Mayer, R. (2007). Interactive Multimodal Learning Environments: Special Issue on Interactive Learning Environments: Contemporary Issues and Trends. *Educational Psychology Review*, 19(3), 309–326. <https://doi.org/10.1007/s10648-007-9047-2>

Nordenbo, S. E. (2002). Bildung and the Thinking of Bildung. *Journal of the Philosophy of Education*, 36(3), 341–352. <https://doi.org/10.1111/1467-9752.00280>

OECD. (2019). *TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners*. OECD. <https://doi.org/10.1787/1d0bc92a-en>

Robson, C., & McCartan, K. (2016). *Real world research: A resource for users of social research methods in applied settings* (4th ed.). Wiley.

Røkenes, F., M. (2016). Lærerstudenters digitale kompetanseutvikling i lærerutdanningen: Hva sier forskningslitteraturen? In R. J. Krumsvik (Ed.), *Digital læring i skole og*

lærerutdanning (2. utg., pp. 49–69). Universitetsforlaget.

Rømer, T. A. (2021). Gert Biesta – Education between Bildung and post-structuralism. *Educational Philosophy and Theory*, 53(1), 34–45.

<https://doi.org/10.1080/00131857.2020.1738216>

Ryberg, T., & Georgsen, M. (2010). Enabling Digital Literacy. *Nordic Journal of Digital Literacy*, 5(2), 88–100. <https://doi.org/10.18261/ISSN1891-943X-2010-02-02>

Secker, J. (2018). The Trouble With Terminology: Rehabilitating and Rethinking ‘Digital Literacy.’ In K. Reedy & J. Parker (Eds.), *Digital Literacy Unpacked* (1st ed., pp. 3–16).

Facet. <https://doi.org/10.29085/9781783301997.003>

Skulstad, A. S. (2020). Multimodality. In A.-B. Fenner & A. S. Skulstad (Eds.), *Teaching English in the 21st century: Central issues in English didactics* (2nd edition., pp. 260–283). Fagbokforlaget.

UNESCO. (2004). *The Plurality of literacy and its implications for policies and programmes: Position*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000136246>

Utdanningdirektoratet. (2020). *Kjerneelementer—Læreplan i engelsk (ENG01-04)*. <https://www.udir.no/lk20/eng01-04/om-faget/kjerneelementer>

Utdanningsdirektoratet. (2017). *2.1 Digitale ferdigheter som grunnleggende ferdighet*. <https://www.udir.no/laring-og-trivsel/rammeverk/rammeverk-for-grunnleggende-ferdigheter/2.1-digitale-ferdigheter/>

Utdanningsdirektoratet. (2020). *Grunnleggende ferdigheter—Læreplan i engelsk (ENG01-04)*. <https://www.udir.no/lk20/eng01-04/om-faget/grunnleggende-ferdigheter>

Utdanningsdirektoratet. (2020). *Overordnet del – verdier og prinsipper for grunnopplæringen*. <https://www.udir.no/lk20/overordnet-del/>

Utdanningsforbundet. (2021, February 26). *Femårige lærerutdanninger og undervisningskompetanse*. Utdanningsforbundet. <https://www.utdanningsforbundet.no/medlemsgrupper/universitet-og-hogskole/ny-master-i-grunnskolelærerutdanning-og-undervisningskompetanse/>

Wetcher-Hendricks, D. (2011). *Analyzing Quantitative Data: An Introduction for Social Researchers*. John Wiley & Sons, Incorporated.

<http://ebookcentral.proquest.com/lib/hogskbergen-ebooks/detail.action?docID=7103890>

Wright, K. (2019). *Handbook of research methods in health social sciences*. Springer Verlag.

Wright, K. B. (2019). Web-Based Survey Methodology. In P. Liamputtong (Ed.), *Handbook of Research Methods in Health Social Sciences* (pp. 1339–1352). Springer.

https://doi.org/10.1007/978-981-10-5251-4_18

Xiao, J., Lin, T.-H., & Sun-Lin, H.-Z. (2020). Exploring the Effect of Multichannel Multimodal Learning Environment on Student Motivation and Self-efficacy. In L.-K. Lee, L. H. U, F. L. Wang, S. K. S. Cheung, O. Au, & K. C. Li (Eds.), *Technology in Education. Innovations for Online Teaching and Learning* (pp. 164–175). Springer.

https://doi.org/10.1007/978-981-33-4594-2_14

English summary

The thesis purpose was to investigate if teachers in Norway were able to use the digital resources available to develop a multimodal learning environment. Previous research has shown that some teachers struggle with how to incorporate the digital resources available into an educational setting. The thesis was divided into several Chapters.

The first chapter was Introduction. The Introduction gave a brief introduction to what was included in this thesis. This chapter also included the research question: Are teachers able to use digital tools to develop a multimodal learning environment in the English classroom?

The second chapter was Theory and Background. This chapter sheds light on the appropriate theory and terms needed to evaluate the data gained in this thesis. This theory included digital literacy, multimodal texts, teachers' professional digital skills and teacher cognition. The theory also included, as mentioned, previous research done. This research, provided by Blikstad-Balas and Klette (2020) and Røkenes (2016), gave valuable insight into how teachers have evaluated their professional digital skills in the previous years.

The third chapter was Methodology. This chapter provided information on the research method used in this thesis. As this thesis was mixed method research and gained the data through an online questionnaire, quantitative and qualitative method approaches were informed in this chapter, as well as the research reliability and validity.

The fourth chapter showed the data gained through the questionnaire. With 40 teachers participating in the questionnaire, the data was introduced in the order of quantitative data first and qualitative data after, as there were more quantitative data gained from the questionnaire.

The fifth chapter was the Discussion. In this chapter, the data was discussed with the appropriate theory. Again, the Discussion gave the data valuable insight into how teachers might be able to develop a multimodal learning environment.

The last chapter was the Conclusion. This chapter concluded the thesis as a whole.

Norwegian summary

Oppgavens formål var å undersøke om lærere i Norge var i stand til å bruke de digitale ressursene som er tilgjengelig til å utvikle et multimodalt læringsmiljø. Tidligere forskning har vist at noen lærere sliter med hvordan de skal inkorporere de digitale ressursene som er tilgjengelig i en pedagogisk setting. Oppgaven var delt inn i flere kapitler.

Det første kapitlet var Introduksjon. Innledningen ga en kort introduksjon til hva som var inkludert i denne oppgaven. Dette kapitlet inkluderte også forskningsspørsmålet: Er lærere i stand til å bruke digitale verktøy for å utvikle et multimodalt læringsmiljø i det engelske klasserommet+

Det andre kapitlet var Teori og Bakgrunn. Dette kapitlet belyser den aktuelle teorien og terminologien som trengs for å evaluere dataene som er oppnådd i denne oppgaven. Denne teorien inkluderte digital kompetanse, multimodale tekster, lærerens profesjonelle digitale ferdigheter og lærerens kognisjon. Teorien inkluderte også, som nevnt, tidligere forskning gjort. Denne forskningen, levert av Blikstad-Balas og Klette (2020) og Røkenes (2016), ga verdifull innsikt i hvordan lærere har evaluert sine profesjonelle digitale ferdigheter de foregående årene.

Det tredje kapitlet var Metodikk. Dette kapitlet ga informasjon om forskningsmetoden som er brukt i denne oppgaven. Siden denne oppgaven var blandet metodeforskning og innhentet data gjennom et nettbasert spørreskjema, ble kvantitative og kvalitative metodetilnæringer informert i dette kapitlet, samt forskningens reliabilitet og validitet.

Det fjerde kapitlet viste dataene som ble oppnådd gjennom spørreskjemaet. Med 40 lærere som deltok i spørreskjemaet, ble dataene introdusert i rekkefølgen av kvantitative data først og kvalitative data etter, da det var flere kvantitative data hentet fra spørreskjemaet.

Det femte kapitlet var diskusjonen. I dette kapitlet ble dataene diskutert med passende teori. Igjen ga diskusjonen dataene verdifull innsikt i hvordan lærere kan være i stand til å utvikle et multimodalt læringsmiljø.

Det siste kapitlet var konklusjonen. Dette kapitlet avsluttet oppgaven som helhet.

Attachment 1 – Questionnaire.

Attachment 1.



Hei og takk for at du ønsker å hjelpe meg med denne spørreundersøkelsen til min masteroppgave. Dette er en spørreundersøkelse for lærere som underviser i engelsk på ungdomsskolen. Dette er en undersøkelse om hvordan lærere og elever bruker digitale hjelpemidler til å produsere engelske tekster. Undersøkelsen tar mellom 5-10 min.

Undersøkelsen er helt anonym.

1. Bruker du som lærer digitale hjelpemidler i skoletimene dine?

- Ja
- Nei

2. Hvor ofte tar du som lærer i bruk digitale hjelpemidler i engelskundervisningen?

- Hver engelsktime
- Ofte
- Av og til
- Sjeldent
- Aldri

3. Til hvilket formål bruker du som lærer som oftest digitale hjelpemidler i engelsktimene når du underviser?

- Skrivning
- Lesing
- Lytting
- Muntlige ferdigheter
- Presentasjoner
- Annet

4. Til hvilket formål lær du som lærer elevene bruke digitale hjelpemidler i engelsktimene?

- Skrivning
- Lesing
- Lytting
- Muntlige ferdigheter
- Presentasjoner
- Annet

5. Føler du at elevene dine har digital kompetanse? Innenfor dette ligger da grunnleggende ferdigheter, nedlastning, søking, etc

- Ja
 Nei

6. Hvilke av disse digitale kompetansemålene føler du elevene dine har kompetanse i?

- Grunnleggende digitale ferdigheter
 Hvordan å laste ned informasjon
 Søke etter informasjon
 Navigere seg i det digitale nettverket
 Kunne organisere og klassifisere informasjon
 Kunne sammenligne og sammenstille ulike typer informasjon
 Evaluere, sjekke og vurdere informasjon
 Kommunikasjon gjennom digitale midler
 Samarbeide med bruk av digitale midler
 Skape tekster
 Være kreativ med bruk av digitale hjelpemidler

7. Hva bruker du når du som lærer lager digitale engelsk tekster?

- Digitale skrift tekster
 Digitale lyd tekster
 Bilder
 Videotekst
 Lager ikke digitale tekster
 Annet

8. Hva bruker du som lærer når du skal finne digitale engelsk tekster til elevene?

- Digitale skrift tekster
 Digitale lyd tekster
 Bilder
 Videotekst
 Annet

9. Hva oppfordrer du elevene dine å bruke når de selv skal produsere engelske digitale tekster?

- Skrift
 Inkludere lyder
 Inkludere bilder
 Lage video
 Annet

10. Dersom du oppfordrer elevene til å variere hvordan de produserer engelske digitale tekster, til hvilket formål oppfordrer du dette?

- Når de jobber med oppgaver
 Når de har presentasjoner
 Ved andre framføringer
 Når de har innlevering
 Annet

11. Når du som lærer tar i bruk digitale hjelpemidler for å skape/finne tekster, til hvilken grad varierer du bruken av forskjellige hjelpemidler valgt i tekstene?



12. Når du som lærer gir elevene oppgaver i å produsere engelske tekster, til hvilken grad varierer du hvordan de skal skape disse tekstene?



13. Føler du at du som lærer oppfordrer variasjon av forskjellige programmer utenom den vanlige digitale skriveboken? (fek. Powerpoint, Creaza, videooptaker etc.) når elevene dine skal produsere noe i engelsktimene?

- Ja
 Nei
 Usikker

14. Til hvilket formål oppfordrer du til forskjellige programmer

- Skrive oppgaver
- Lese oppgave
- Framføringer
- Innleveringer
- Annet

15. Hva legger du i begrepet "multimodal tekst"?

16. Føler du at du som lærer har fått god nok opplæring i PFDK (profesjonsfaglig digital kompetanse)?

- Ja
- Nei

17. Hvor har du fått opplæringen din av PFDK?

- På skolen, gjennom andre lærer og medarbeidere
- Gjennom kurs og faglige møter i regi av skolen
- Gjennom møter som ikke er i regi av skolen
- Fra utdanningen
- Fra eget initiativ
- Annet

18. Hvor stor del av denne opplæringen følte du var nyttig og kan ta i bruk i dine engelsktimer?



19. Gjennom denne opplæringen, fant du nye digitale hjelpemidler som du har tatt i bruk eller ønsker å ta i bruk i engeksltimene?

- Har lyst å ta i bruk
- Har planer om å ta i bruk
- Har ikke hatt tid
- Har ikke hatt anledning
- Trenger mer digital kunnskap/kompetanse til å ta i bruk
- Har ikke noe jeg har lyst å ta i bruk

20. Hvor lenge har du jobbet som lærer?

- 1-5 år
- 6-10 år
- 11-15 år
- 16 år eller lenger

21. Hvilket kjønn er du?

- Mann
- Kvinne
- Annet
- Vil ikke svare

Tusen takk for at du har tatt deg tid til å svare på min spørreundersøkelse! Dette setter jeg enormt pris på, da dette hjelper meg til å fullføre min masteroppgave.

Attachment 2 – Mail sent to gain participants.

Hei. Mitt navn er Torbjørn Aandahl. Jeg skriver en masteroppgave i engelsk og trenger hjelp fra de lærerne med Engelsk som et av sine fag sin hjelp til en liten spørreundersøkelse som tar mellom 5-10 min å svare på. Den er helt anonym og da trenger ingen informasjon om de som svarer. Jeg sender denne mailen til Lederene på skolene i Bergen kommune i håp om at dere kan sende denne videre til ungdomsskole lærerne sine som har Engelsk som fag. Undersøkelsen kan svares på enten pc eller på mobil. Alt man trenger å gjøre er å klikke inn på denne linken her.

<https://www.survey-xact.no/LinkCollector?key=GJUPXFVSS59J>

Undersøkelsen handler om hvordan lærere tar i bruk digitale hjelpemidler på skolen, og hvordan de lar elevene bruke digitale hjelpemidler når de skal skrive digitale tekster.

Håper dere kan sende denne videre til de lærerne som har Engelsk på ungdomstrinnet på deres skole. Tusen takk på forhånd!

Mvh Torbjørn Sundal Aandahl,