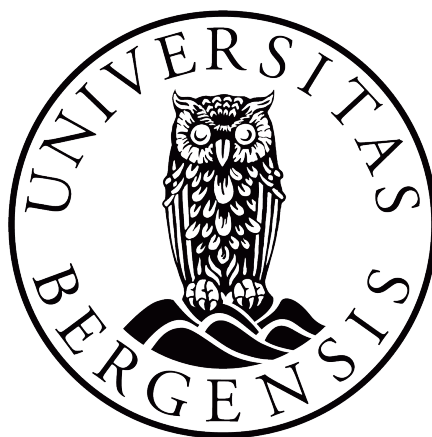


Promoting Strategic Readers in a Digital Age:
*Teachers' reported beliefs on the digitized L2 textbook's
potential for promoting reading strategies in the EFL
classroom*



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Acknowledgements

With these words, I mark the end of a rewarding and challenging chapter here at the University of Bergen. The process of writing an MA thesis has allowed me to challenge myself and reminded me of how important the "growing pains" are on my path to reaching my goals.

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Kaja Sandanger

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Abstract in Norwegian

Å lære å lære er en sentral del av engelskfaget ifølge *Kunnskapsløftet 2020* (LK20). Dette innebærer at elevene utvikler strategier for å tilegne seg og anvende kunnskap. I det 21. århundre har måten elever lærer og tilegnet seg blitt stadig mer påvirket av teknologi. De siste årene har blant annet digitale lærebøker blitt mer fremtonet i norske klasserom, som har i enda større grad digitalisert måten elever leser på. Digitaliseringen av lærebøker har skapt mye reaksjoner blant både lærere og elever og i flere tilfeller er det blitt ytret ønsker om å returnere til penn og papir for å verne om læringen til elevene.

Denne masteroppgaven har tatt for seg læreres holdninger til digitale lærebøker i engelskfaget. Med formål å nyansere debatten om digitaliseringen av lærebøkene, har de digitale lærebøkene blitt undersøkt for potensiale for å fremme lesestrategier i engelskfaget.

Ved hjelp av en spørreundersøkelse som kombinerte kvalitativ og kvantitativ data har studiet undersøkt læreres holdninger ved ulike videregående skoler i hele Norge. Med et utvalg av 39 lærere ved videregående skoler, bidrar studiet til et mer nyansert bilde av læreres holdninger til de digitale lærebøkene i engelskfaget.

Studien avdekker at lærere anerkjenner et potensial ved de digitaliserte engelsk lærebøkene. Når man skal fremme lesestrategier anses de integrerte funksjonene som lyd støtte, utvidet materiale, navigasjonsverktøy i tekst og noteringsverktøy som nyttige. Noen lærere understreket også at den økende tilgjengeligheten av digitale tekster øker relevansen for leseferdigheter og lesestrategier for lesing på skjerm. De digitale lærebøkene oppleves også som utfordrende på en rekke punkt. Praktiske utfordringer knytter til IKT og forstyrrelser tilgjengelig på digitale leseenheter er utfordringer majoriteten av deltakerne belyser. Hvilke innvirkning skjerm har på leseprosessen og generelle læringsprosessen til elevene er også en utfordring lærerne i dette studiet opplever med digitale lærebøker.

Datainnsamlingen viser at lærere ser både potensiale og utfordringer med digitale lærebøker i engelsk når man fasiliterer elevenes utvikling av lesestrategier. Det viser også at bruken av digitale lærebøker er et komplekst tema, som må belyses i enda større grad av forskning som tar høyde for de didaktiske implikasjonene hvert enkelt fag innebærer. Et interessant funn, er at til tross for høy selvrapportert digital kompetanse så er det en stor andel av studiets deltakere som oppgir at de har hatt liten til ingen eksplisitt opplæring i hvordan de skal gjøre god nytte av IKT i klasserommet. Dette foreslås som et trolig utviklingspotensial for både lærerutdanningsinstitusjonene og skolelederne for å sikre hensiktsmessig bruk av teknologi i klasserommet i framtiden.

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LIST OF ABBREVIATIONS

L1: First language

L2: Second language

EFL: English as a foreign language

DT(s): Digitized textbook(s)

PT(s): Printed textbook(s)

ICT: Information and communication technology

LLS: Language learning strategies.

NSD: The Norwegian Center for Research Data

R: Respondent - only used when providing direct quotes from respondents.

Promoting Strategic Readers in a Digital Age:

Teachers' reported beliefs on the digitized L2 textbook's potential for promoting reading strategies in the EFL classroom

1.0 INTRODUCTION

Teachers have for many years relied on textbooks to shape and inspire their teaching practices (Skjelbred & Aamotsbakken, 2008). Over the last decades, the idea of what a textbook is, as well as what teaching material is has been challenged. Information is continuously becoming outdated due to the Internet and technological advancements. In response, the producers of teaching material have made various attempts to keep up with developments and use the digitally-rich environment outside the classroom to do so.

In the EFL classroom, the strive toward authentic meetings with the L2 has become more accessible through the means of technology (Ørevik, 2020a). News articles, literature, social media platforms, and popular culture can invite the students to engage with L2. To promote the students' engagement through authentic L2 texts, the material should keep up with current events (Ørevik, 2020a). Due to financial restrictions related to teaching material, the schools might find themselves using the same books for several years. Ultimately, this reuse of material may lead to texts, editorial perspectives, topics, statistics, and even a language that are no longer in sync with the present English-speaking world.

The use of digital resources to accompany printed textbooks has become a common practice (Ørevik, 2015). The digital resources are designed to complement the printed textbook, add multimodal aspects, or at times compensate for lacking material on current affairs (Gilje et al., 2016; Ørevik, 2015). In addition, teachers take it upon themselves to find relevant material online for their students, bridging the textbook and the information sources accessible through a screen. Publishers have made efforts to renew the textbook to offer both the textbook, the supplementary material, and supporting tools in one place. The result is various digitized versions of the textbook, accessible through a computer screen or a reading device such as an iPad or a Kindle. Thus, how students read is changing. Additionally, the recent pandemic of covid-19 has highlighted the importance of digital technology in schools.

The abrupt change from physical classrooms to school lockdowns forced many of us to teach partially or fully online. Perhaps the recent immersion in digital teaching has changed how teachers perceive digitized material such as textbooks.

1.1 Rationale for the Present Thesis

During my teacher training practice, I was at a school that had started using digitized textbooks. The change was relatively recent, but they had still implemented it over some time. I observed teaching practices where the textbook had a prominent role in the classroom. However, I found it interesting that while all students used digitized textbooks, several teachers used the printed version themselves. Initially, I thought it was merely a matter of personal preference. However, as I started using the digitized textbooks, I realized that there were several integrated functions that I would not have been able to assist the students in using if I did not have experience with them. Without having experience with the DTs, I would likely find it challenging to use them in my teaching at the same level of quality. I was curious to what extent we teachers are trained to make good use of digitized textbooks in our classrooms. Another aspect I was left wondering about was the extent to which teachers are interested in this digitization of the renowned textbook. How do teachers perceive the shift towards digitized textbooks? Do they experience that this affects the development of strategic readers in the EFL classroom?

As publishers are offering digitized formats of the L2 textbooks, both the teachers and students are introduced to a different, interactive format of the didactic material. Several concerns regarding the digitization of the didactic materials have been voiced by students and teachers. On a Facebook forum for teachers in Norway, this topic has repeatedly engaged many of its members to express their thoughts. In the fall of 2021, a recently retired teacher commented on his concern about the lack of textbooks in the Norwegian classroom (Nilsen, 2021). The teacher referred to this change towards digitization as a collective cerebral hemorrhage. The post fostered engagement from several perspectives on the debate regarding "printed books versus digitized books".

A similar concern was voiced as recently as April 2022 by a teacher and leader of *fagutvalg for norsk* in the organization *Lektorlaget*, Cathrine Krogh. Although emphasizing the Norwegian subject, she advocates giving the students their books back, allowing them to read without the disruption that digitized books represent (Krogh, 2022). The digitization of teaching material is associated with concentration being "in free fall" (Krogh, 2022, my

translation). Alongside several other teachers, parents, and students, these perspectives suggest that the digitization of textbooks should be further researched (Brekke, 2021; Brochmann, 2020; Ditleifsen & Hamre, 2020; Krogh, 2022; Nilsen, 2021; Rørvik, 2022). I wished to investigate this "debate" through the scope of language learning. It is not necessarily a question of for or against digitized textbooks but what potential advantages and challenges these present for EFL teaching. To fully evaluate teaching materials, it is necessary to consider the didactic implications of the subject.

The renewed curriculum for English states that language learning “takes place in the encounter with texts in English” (The Norwegian Directorate for Education and Training, 2019b, p.1). The curriculum's understanding of texts is in the widest sense of the word, which means texts can be “spoken and written, printed and digital, graphic and artistic, formal and informal, fictional and factual, contemporary and historical” (The Norwegian Directorate for Education and Training, 2019b, p.1). The textbook is a source for a variety of these texts for many teachers and students. Regardless of the format, the textbook contains numerous texts that invite the learners to read in their L2.

The English curriculum values reading as one of the basic skills of the L2 (The Norwegian Directorate for Education and Training, 2019a). The skill of reading is attributed to the ability to understand and reflect upon various content, both on paper and on-screen. Another aspect of the curriculum that connects to reading and language learning, is the ability to make use of language learning strategies (The Norwegian Directorate for Education and Training, 2019a; The Norwegian Directorate for Education and Training, 2019b). This notion of language learning strategies is further specified in the following competency aim: “use appropriate strategies for language learning, text creation and communication” (The Norwegian Directorate for Education and Training, 2019c). Specifically for reading, this refers to the use of reading strategies to understand information, both explicit and implicit (The Norwegian Directorate for Education and Training, 2019a).

As already mentioned, the way students read is changing as a consequence of digitization. This is a change that might affect both the context of reading and the readers significantly. The English curriculum also advocates students' ability to use appropriate digital resources and other aids to help their development in the L2 (The Norwegian Directorate for Education and Training, 2019c). A digitized textbook may offer the students an encounter with digital resources, but this does not guarantee that these are the appropriate resources to aid the students in developing reading strategies.

The use of digital textbooks has been met with skepticism by both teachers and students who call for a return of printed textbooks (Brekke, 2021; Ditleifsen & Hamre, 2020; Krogh, 2022; Nilsen, 2021; Rørvik, 2022). All despite the fact that today's students all represent a generation that has grown up with technology. The familiarity with ICT both in school and at home should arguably indicate a sufficient competence in using digital didactic material, as they are *digital natives*. This has, however, proven to be a debatable term. As early as 2001, Prensky coined the term *digital natives*, which referred to the first generation that had grown up with digital technology. The students born between 1980 and 1994 were argued to possess a parallel or multi-tasking nature, processing information fast and are used to instant gratification (Prensky, 2001). Prensky (2001) referred to the contrasting older generation as *digital immigrants* who did not possess the competence level to skillfully navigate digital technologies in the same way as the claimed *digital natives*. The idea of digital natives has been contested as an inaccurate generalization of a whole generation (Bennett et al., 2008). Bennett et al. (2008) argue that the relationship between young learners and digital technology is far more complex than the idea of digital natives includes. There is no automatic ICT competence reliant on generational shifts, underlining that also the present-day youth may not be as technologically savvy as their technology-rich environments may imply.

The use of digitized material in the classroom has been found to be highly dependent on teachers' attitudes and motivation (Bildtvedt & Bergheim, 2018). Therefore, an interesting scope of investigation may be whether or not the teachers experience that a digitized textbook offers any advantages or challenges in the L2 classroom. More specifically, towards the promotion of language learning strategies. The present thesis will not aim to discuss the didactic qualities of digitized textbooks in general. The aim will, however, be focused on if teachers perceive these textbooks as a digital tool that may promote reading strategies in the L2, and in this process what potential challenges they envision.

1.2 Aim and Scope

The purpose of the present thesis is to identify upper secondary teachers' reported beliefs about digitized L2 textbooks' potential and challenges for promoting the students' reading strategies. The thesis aims to answer the following research questions:

What are the teachers' reported beliefs on the digitized L2 textbook's potential for promoting reading strategies in the 21st-century EFL Classroom?

Sub research questions:

1. To what extent do teachers believe that the digitized L2 textbook has the potential for promoting reading strategies?
2. To what extent do teachers experience that they have adequate experience to teach reading strategies, on screen and on paper, with the same level of quality?
3. What are some advantages and challenges that teachers associate with the digitized L2 textbook when promoting reading strategies?

1.3 Previous Research

This thesis aims to investigate the potential for promoting strategic readers in the digital age by means of digitized L2 textbooks. What it means to promote strategic readers has previously been investigated through the topics of reading comprehension and reading strategies (Afflerbach et al., 2017; Brevik, 2019a; Brevik et al., 2016; Brevik et al., 2020; Duke et al., 2011; Okasha, 2020). Studies have also been conducted on the use of digitized textbooks and digital material in education (Anderson, 2003; Bikowski & Casal, 2018; Bruner-Mercer, 2019; Coiro, 2003; Gilje et al., 2016; Gudmundsdottir & Hatlevik, 2018; Røkenes & Krumsvik, 2016). However, to the author's best knowledge, there has not been any research on the use of digitized textbooks to promote reading strategies in the Norwegian EFL classroom. As this thesis positions itself in the intersection of several research fields within English didactics, a literature review of previous research is offered. The fields of research to be elaborated on are (1) strategic readers in the 21st century, (2) teacher cognition and ICT, and (3) digitized textbooks in learning environments.

1.3.1 Strategic readers in the 21st century

The topic of reading comprehension and reading strategies has been extensively researched (Brevik, 2019a; Brevik et al., 2016; Brevik et al., 2020; Afflerbach et al., 2017; Duke et al., 2011; Okasha, 2020). The implications that the 21st-century skills perspective has on L2 readers have also been investigated by several scholars (Alexander, 2012; Cho & Afflerbach, 2017). These studies have one factor in common, they underline the role of the teacher as a facilitator and guide in the development of reading competence.

In 2015, Haugestad found that blended teaching of literature through both traditional and digital resources could promote the students' engagement. However, the master's thesis showed negative student reports about digital reading and the experience of art through a screen (Haugestad, 2015). These negative reports were linked to disruption of deep reading and a weakened ability to relate to characters in fictional texts. Such findings make it evident that a shift toward fully digitized textbooks should not be done without sufficient research and consideration.

While Haugestad (2015) primarily focused on literature, the MA thesis by Gulbrandsen (2018) looked at the characteristics of the relationship between different types of text media in English lower secondary school classes. The study was a follow-up investigation to Brevik (2019b), also looking at the teaching and use of reading comprehension strategies. Gulbrandsen (2018) discovered that printed text was the most prominent media type in the L2 classroom. When mixing printed and digital text media, the classes seemed to participate in multimodal reading activities. In comparison to other text mediums, hypertext was underrepresented. The reading strategies employed for digital text medium were identical to those employed for printed text (Gulbrandsen, 2018).

Because the author noticed that teachers commonly instigated reading strategies, he proposed that teachers explore using more diverse text media in the EFL classroom (Gulbrandsen, 2018). Using various text media in the EFL classroom would help learners "develop proficiency with reading comprehension strategies across text media" (Gulbrandsen, 2018, p. V). Since the survey has been completed, there has undoubtedly been an increase in the digitization of text media. Despite Gulbrandsen's (2018) results, the reading strategies that will best complement digital media reading may differ from printed text reading. Several scholars argue a more complex reading context with on-screen reading than on paper (Anderson, 2003; Auer, 2016; Bruner-Mercer, 2019; Coiro, 2003). Accordingly, the difference between the formats should be acknowledged when choosing reading strategies. The complexities of reading strategies will be further expanded on in this thesis' theoretical framework (Chapter 2).

1.2.2 Teacher cognition and ICT

Research on *teacher cognition* has long been an important focus of educational research. This term refers to "the unobservable cognitive dimension of teaching – what teachers know, believe, and think" (Borg, 2003, p. 81). A great deal of research has been conducted to understand what impacts teachers and how these impacts manifest themselves in

their teaching practices (Borg, 2003). Teacher cognition is a complex concept that collectively refers to the psychological constructs related to a teacher's profession (Borg, 2003). Borg (2003; 2015) categorizes these constructs in detail, which will be elaborated on in the second chapter of the present thesis. To map the previous research on teacher cognition relevant to the presented research question, I will focus on research on teacher cognition related to ICT.

The research of Gudmundsdottir & Hatlevik (2018) and that of Røkenes & Krumsvik (2016) found that teachers and student teachers' ability to make good use of ICT in the EFL classroom is dependent on several factors. Gudmundsdottir & Hatlevik (2018) surveyed 356 newly qualified teachers and found that nearly half of the new teachers experienced having inadequate ICT competence. The findings of Røkenes & Krumsvik (2016) targeted the foundation, the teacher education. They discovered that student teachers' education both enabled and inhibited the development of ICT competence. The digitization of the EFL may hold challenges for teachers, despite teacher educators' efforts to prepare their students for teaching in the 21st century. The more recent study by Kongsgården & Krumsvik (2019) demonstrated that the teachers' ability to develop a practice where didactic choices justify the ICT use is critical for promoting positive learning outcomes among upper secondary students. If the technology dictates the didactic choices, the learning can be compromised.

There have also been several master's theses that look at teacher cognition related to ICT use in the classroom (Fredriksen, 2016; Klungland, 2017; Mo-Bjørkelund, 2020). While Fredriksen (2016) explored teachers' digital competence and use of digital tools in general, Klungland's (2017) thesis explored teachers' perception of literature and multimodal texts in a digitized society. Klungland revealed that multimodal texts (e.g., digitized books) were mainly chosen to provide variation or meet individual students' learning needs. The teachers did not seem to utilize multimodal text's learning potential to its total capacity (Klungland, 2017). These findings suggest a risk that the digitized L2 textbook might be perceived and used in the same limited capacity.

Mo-Bjørkelund (2020) employed a mixed-method approach when investigating teachers' perception of digital competence and skills in the digitized 21st century EFL reading context. The research project also included the adaptive learning platform *readtheory.org*. He presented findings that indicated some correlation between digital competence and frequent use of digital resources in the classroom (Mo-Bjørkelund, 2020). As the use of digitized textbooks may not be optional at the same level as other digital resources, an investigation of teachers' perspectives on this may hold a different relationship to ICT competence.

An investment in digitized textbooks may be a decision that is influenced by both the school leaders and the pedagogical staff (Biltvedt & Bergheim, 2018). The textbook has had and continues to have a strong guiding position in teachers' practices. In both individual lessons and classroom activities, the printed textbook has a significant structural function (Gilje et al., 2016; Skjelbred & Aamotsbakken, 2008). Due to its prominent role in teaching practices, it may consequently be the teacher who decides which textbooks to include in their subject.

Together with other Scandinavian countries, Norway has a long tradition of allowing the teachers to decide on didactic material within each subject (Gilje et al., 2016). Recent research has demonstrated that teachers to a large extent are the ones who decide on which didactic material the school buys, confirming this very tradition (Gilje et al., 2016). To what extent may vary depending on the school level. In this regard, the role of teachers in primary school has been argued to be reduced in favor of school administrators (Krogh, 2022). It is also important to note that school owners may grant financial support for teaching material, without necessarily a sufficient budget for both 1-1 coverage on digital devices and 1-1 coverage of hard copied textbooks. Nevertheless, within the financial restrictions, teachers tend to influence which didactic material will be bought. As a result, it is an intriguing topic of investigation is the teachers' perspectives regarding textbook digitization in the EFL classroom.

1.2.3 Digitized textbooks in learning environments

In 2018, Qin et al. investigated the perceived value of an interactive digital textbook (LearnSmart) and its impact on student learning and adaptive learning. The digital textbook was characterized by interactive¹ and adaptive learning². The study was conducted on college students but bears some relevant findings to the EFL classroom. The participants perceived the interactive digital textbook as beneficial (Qin et al., 2018). The main reason for this perception was the DT's adaptive properties. One limitation of the study is that the students' grades were not included in the study. Thus, the digital textbook was not argued to increase learning, though the students themselves perceived it as valuable. Nevertheless, the students'

¹ Interactive learning refers to a learning environment where “what happens depends on the actions of the learner” (Mayer & Moreno, 2007, p 310). Responsiveness to the learner's actions is a defining feature of interactive learning. An interactive feature does not necessarily adapt to a learner's performance.

² Adaptive learning refers to the education material/software that uses technology to record and adapt to the users/learners' choices and performances. The software allows the students to receive individually adapted tasks based on what they have done previously (Gilje, 2022)

personal perception is linked to motivation, an aspect that is essential to facilitate learning (Qin et al., 2018).

Bikowski & Casal (2018) found through a mixed-method study on interactive digital textbooks, that the digitized textbooks did engage the students. The study looked at non-native speakers of English in higher education and their use of interactive textbooks on mobile devices (i.e., smartphones or tablets). Though focused on a sample of 13 students who were learning “Business English”, the main focus was not to develop any specific language skills (e.g., reading, speaking, listening, or writing). Bikowski & Casal (2018) did, however, argue that customization is essential for disciplinary writing and language learning within a specific context such as Business English.

The ability of customization was a factor that led to engagement when interacting with the digital textbooks (Bikowski & Casal, 2018). The authors underlined the importance of a variety of tools and strategies to help the students utilize the digital textbooks effectively in their learning. To foster a learning relationship between students and their digital textbooks and devices, teachers may need to make deliberate efforts (Bikowski & Casal, 2018).

Despite promises of engagement among students, there is research that suggests challenges as well. In 2019, Verkijika presented findings on the adoption and continued use of digital textbooks. The study included two samples from a South African University that demonstrated that digital textbooks were found to be useful (Verkijika, 2019). The perceived usefulness of the books was, however, limited by what the researcher refers to as *technostress* (Verkijika, 2019). The term *technostress* refers to the “stress an individual experiences due to their use of information systems (IS)”, establishing the use of IS as a stress-creator (Tarafdar, 2019, p. 7).

Based on a meta-analysis of research between 2000-2017, Delgado et al. (2018) claimed that reading digital texts included more challenges when compared to reading on paper. According to the research, one of the factors that makes digital text reading challenging is a limited timeframe (Delgado et al., 2018). When comparing time-constrained reading to self-paced reading, reading on paper was found to be more beneficial for reading comprehension over time.

To the author’s best knowledge, there have been two master's theses closely related to the topic of the present thesis. Ødegård (2017) explored the use of digitized textbooks in the English subject, whereas Biltvedt & Bergheim (2018) investigated teachers’ perception of digitized textbooks across subjects. The study by Ødegård (2017) focused on the use of the

digitized textbook series *Skills*³ from Gyldendal's platform *Smart bok*⁴. The author compared the publisher's intention of use and the teachers' reported use. The study does not take into account any specific learning theories but accounts for the teachers' general perception of promoting basic skills in English and use of digitized textbooks. The teachers' reports on available training with the textbooks were varied (Ødegård, 2017). Some relied on colleagues whereas others wanted the school and publisher to offer more training (Ødegård, 2017). Ødegård (2017) described an interesting case of a teacher who did not report any difficulties with using the digitized textbook but still chose to rely primarily on printed books. The competence level did not indicate an automatic preference for the digitized version but a critical perspective on the current quality and user-friendliness.

The master's thesis of Biltvedt & Bergheim (2018) on teachers' perception of digitized textbooks across subjects revealed that Norwegian teachers acknowledge advantages and disadvantages with both the digital and the printed format. Though limited to a case study of four teachers⁵, the authors found that the teachers' teaching approaches did not differ significantly depending on the format (Biltvedt & Bergheim, 2018). This finding was linked to the practice of digitized textbooks largely being utilized to replace printed textbooks. The study found a possible link between the teachers' perceived digital competence and their use of ICT in the classroom. Biltvedt & Bergheim (2018) suggest that for the teacher to improve the students' digital skills and facilitate learning through technology, the teacher must have a clear goal for the use of technology in the classroom (Biltvedt & Bergheim, 2018). This also includes the use of digital didactic material such as digitized textbooks. A small-scale⁶ quantitative study from Sweden also underlined that the teachers experience not having sufficient time to review digitized textbooks and select the best-suited option for their students (Lindqvist, 2019). A time-pressed teacher may not have the prerequisites necessary to make use of digitized textbooks' potential for EFL learning.

While digitized textbooks have been researched in education previously, it appears that research has not yet been done on digitized L2 textbooks for promoting reading strategies. The research on digitized textbooks in learning environments has primarily focused on the students' perception. With the exception of Ødegård (2017) and Biltvedt & Bergheim (2018)

³ The *Skills* series is a series of English textbooks for upper secondary vocational studies in Norway (Ødegård, 2017)

⁴ See sub chapter 1.4 Digitized textbooks for further details on the digital platform *Smart bok*.

⁵ The case study used interviews as the method and the sample consisted of four teachers. Two teachers in upper secondary and two teachers in lower secondary (Biltvedt & Bergheim, 2018).

⁶ The study of Lindqvist (2019) used interviews as the method, applied to a sample of two teachers.

which were limited to qualitative methods and small samples of teachers. The digitized textbooks have been researched mainly independent of the didactic implications of the subjects where they are used. As a result, a limited perspective on second language learning through digital textbooks has been presented.

As Borg (2003) makes clear, teachers' perceptions impact their teaching. The presented research on digitized textbooks and teacher cognition related to ICT emphasizes the teacher's central role. Therefore, it is clear that teachers' perception of digitized L2 textbooks when promoting reading strategies may provide valuable insights. The master's theses of Ødegård (2017) and Biltvedt & Bergheim (2018) demonstrate valuable qualitative data on digitized textbooks that may benefit from further investigating through a more quantitative approach. Another important aspect to consider is that these studies predate the pandemic, covid-19. There may be a shift in teachers' perceptions after several years affected by school lockdowns and more digital teaching. As a result, the EFL classroom is arguably more affected by digitization than ever.

The previous research on digitized textbooks indicates great variation in what defines these textbooks. Therefore, it is essential that what is meant by digitized textbooks for the present thesis is established. The following sub-chapter will define what characterizes digitized textbooks for the purpose of further research.

1.4 Digitized Textbooks

Today, most publishers offer some degree of digitized versions of their didactic material for Norwegian students (Pukstad & Bråtveit, 2016). Digitized textbooks refer to textbooks that are portable and accessible through digital formats on devices such as computers, hand-held reading devices, and smartphones. A common denominator of digitized textbooks is the co-existence of text and integrated functions to interact with the text. Functions such as audio support while reading a text, the possibility of underlining, making highlighting, dictating comments, and making smaller notes. These functions allow the students to interact with the text. The functions may also be referred to as tools, indicating an intention of support while studying (Ødegård, 2017).

Many students may benefit from the functions that a digitized textbook offers (StatPed, 2020). The digitized textbook allows each student to make personalized adjustments to suit their individual needs. Students with learning disabilities or physical disabilities such as visual impairment are groups that have been argued to benefit from digitized textbooks (Jing

& Chen, 2017; Pukstad & Bråtveit, 2016). Despite the digitized textbook's claimed benefits for the special education segment, digitized textbooks are making an appearance in classrooms all over Norway.

Publishers present their renewed textbook alternatives as a format of material that caters to the majority of students and offer a step toward the future of textbooks. Digitized textbooks have undergone substantial developments since it was first introduced. Some schools have chosen to replace their entire physical textbook inventory in favor of a fully digitized bookshelf. Other schools have chosen a co-existence of both traditional printed textbooks and digitized textbooks. In some cases, a digitized alternative is offered to each printed textbook. In contrast, others only offer digitized textbooks in courses where the need to renew didactic material continuously is more prominent or with smaller student groups.

To demonstrate which digitized textbooks are available to Norwegian upper secondary schools, digital book platforms from the currently biggest providers will be presented: (1) *Smart bok*, (2) *Unibok*, and (3) *Brettboka*. *Smart bok* is the digital reading platform by the publisher Gyldendal. The books are accessible through an internet browser, and the e-book platform has recently been incorporated into Gyldendal's digital learning environment *Skolestudio*⁷. The digital book platform by the two publishers, Cappelen Damm and Aschehoug, is named *Unibok* and offers a digital library of their publications. *Unibok* is also accessible through an internet browser. Lastly, *Brettboka* is an independent digital textbook platform. The platform offers publications from several publishers, and the books are available as pdf files. *Brettboka* is available both online and through their app under the same name.

All three platforms offer textbooks for upper secondary English following the renewed curricula. The textbooks are purchased through licenses on all three platforms. The licenses are attached to individual textbooks and usually last for one year, before being renewed. All options offer in-text navigation, search functions, and text processing tools such as underlining/highlighting. Both *Smart bok* and *Unibok* offer recorded audio as well as synthesized speech for all their publications. Whereas *Brettboka* only offers this to a selection of the textbooks available on their platform. To demonstrate the interfaces of the presented reading formats are included in the figures below (Figure 1, Figure 2, and Figure 3).

⁷ *Skolestudio* is a fully digital learning platform provided by Gyldendahl. The platform gathers all digital resources by the publisher in a user-friendly format, accessible through an internet browser.

Figure 1

Example⁸ of the interface of Smart bok (1)

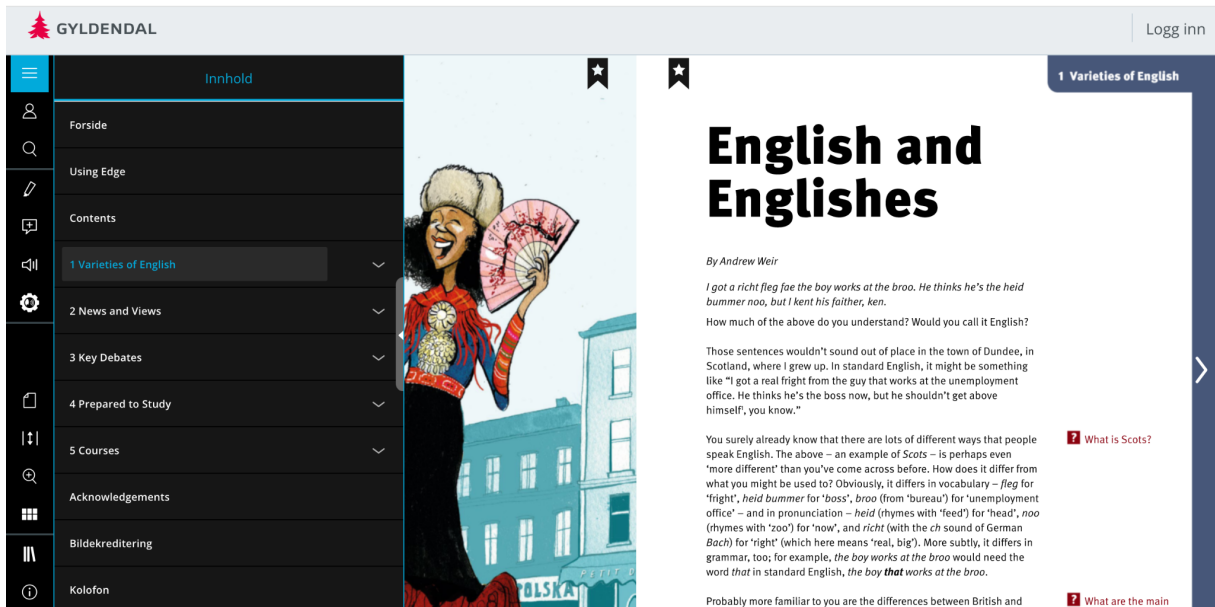
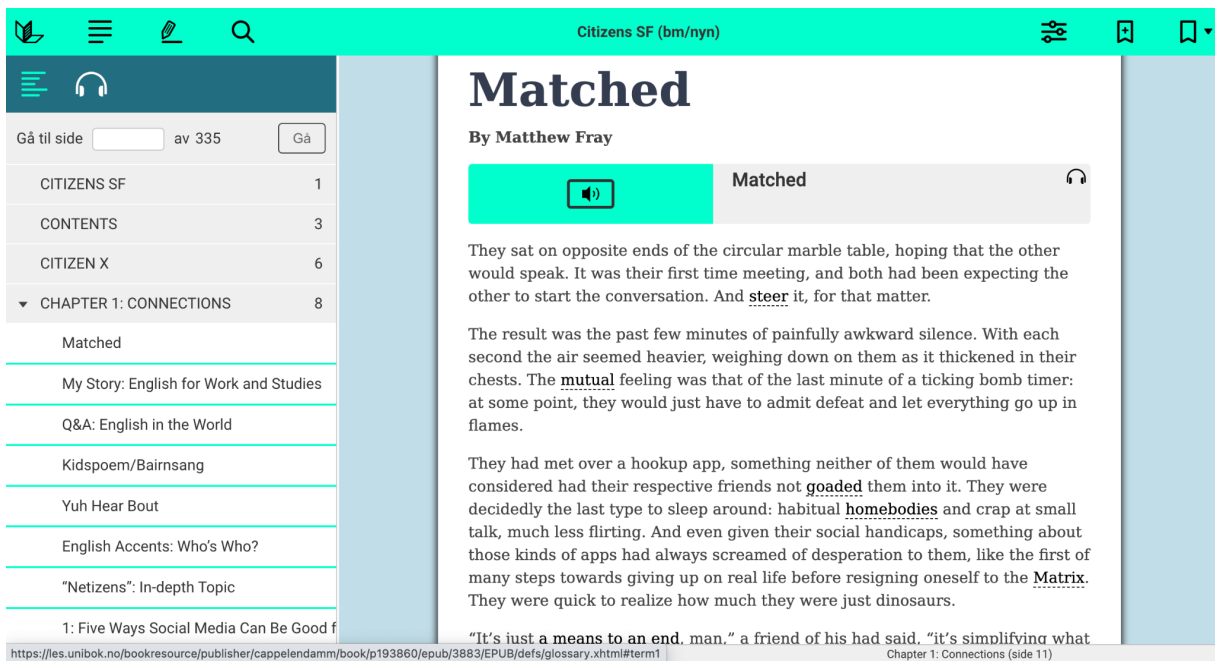


Figure 2

Example⁹ of the interface of Unibok (2)

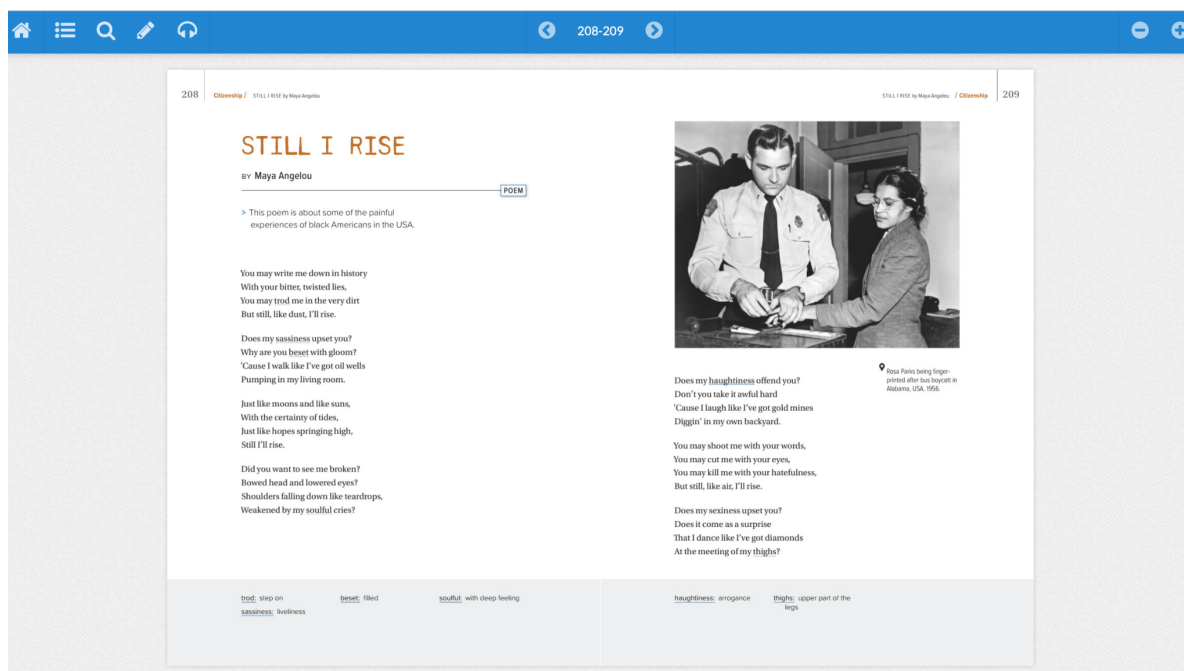


⁸ The example is retrieved from *Edge* (Pettersen et al., 2021).

⁹ The example is retrieved from *Citizens SF* (Andersen et al., 2020).

Figure 3

Example¹⁰ of the interface of Brettboka (3)



The interface of the different digital platforms shares a resemblance and offer most of the same tools. However, some of the tools vary in quality depending on how advanced the individual functions are. The function of hyperlinks to in-text glossaries on predicted words is only available in *Unibok*. The function of pre-recorded audio-support of the text is available on all three platforms but to a greater extent on *Smart bok* and *Unibok*. These two offer readings in a variety of English that is paired with textual content. E.g., A text about Northern Ireland is accompanied by a Northern Irish English variety.

The presented examples of digitized textbooks make up a general notion of digitized textbooks in the Norwegian EFL context. The present thesis will not aim to investigate teachers' perception of the specific variants of digitized textbooks, but of the general notion of “digitized L2 textbooks for the English subject in upper secondary schools”.

Although research literature refers to the textbooks as “digital textbooks”, it was made a choice to use “digitized textbooks” for the present study. The reason for this distinction is that all included examples of textbooks exist as a parallel version to its printed “original”, that is, a digitized version of an already printed textbook. None of the textbooks were designed to be only digital, despite some schools choosing to use only the digitized version. It is, however, important to note that the digitized textbook offers a compound of text, pictures, sounds,

¹⁰ The example is retrieved from Echo 8-10 (Burner et al. 2020).

interactive features, and extended material in one digital space. Thus, it offers more than its printed version in its physical form which is left dependent on a variety of different components to deliver the same compound (i.e., notebooks or digital note-taking software/writing software, pencils, separate audio files (traditionally on CDs), the internet, physical/digital dictionary). For the purpose of this thesis, digitized textbooks will be referred to as digitized textbooks and the abbreviation “DTs” interchangeably.

1.5 Outline of Thesis

To investigate the research question, this thesis is structured in the following manner: firstly, the theoretical framework of the present thesis will be presented. The theoretical chapter will support the development of the research design and discussion of the presented findings. Secondly, an elaboration on the methodology will be presented. Thirdly, the findings of the conducted research design will be presented. Lastly, a conclusion will be offered and some implications for further research.

2.0 THEORETICAL FRAMEWORK

The aim of this study is to investigate how Norwegian L2 teachers experience digitized L2 textbooks' potential for promoting and developing the students' reading strategies. A theoretical framework defining the fundamental themes of this thesis will be offered for the purposes of the subsequent investigation. As a result, the definitions offered will establish what these notions signify throughout the study.

In the first section, I will discuss the digitized L2 textbook from a learning perspective, using the sociocultural theory of Vygotsky (1978) and Wood, Bruner & Ross (1976). The second section will present theory on language learning strategies and reading strategies in specific, relying on Oxford (1990; 2017), Brevik (2016; 2019a), and Brevik et al. (2020). With this as a background, the section will further explore how the digital format affects reading through the research of Anderson (2003), Buckingham (2015), Bruner-Mercer (2019), Coiro (2003; 2015), E-READ (2019), and OECD (2021). Based on Borg's (2003) model of teacher cognition, the last section of the theoretical framework will offer relevant research on the development of ICT competence among teachers and its implications for teaching (Gudmundsdottir & Hatlevik, 2018; Lund, 2017; Røkenes & Krumsvik, 2016; Ørevik, 2020b).

2.1 The Digitized L2 Textbook from a Socio-cultural Perspective

The sociocultural perspective on learning describes learning as a social process where individuals learn through interaction with others (Säljö, 2016). The Russian psychologist Lev Vygotsky has had a prominent role in the development of this understanding. Scholars within the fields of pedagogy and didactics continue to acknowledge his contribution to the field (Bøhn, 2018; Newman & Latifi, 2021; Säljö, 2016). Vygotsky's central ideas include the following: *the theory of the zone of proximal development*, *scaffolding*, and *appropriation* (Vygotsky, 1978).

Within the field of language learning, Vygotsky's theory of *the zone of proximal development* (ZPD) has been linked to increased learning effect (Bøhn, 2018; Vygotsky, 1978). The theory of *the zone of proximal development* refers to "working in the room for maneuver between the level where you are now and the level you are moving towards" (Bøhn, 2018, p. 206). Support is emphasized as a key factor in achieving an increased learning effect (Vygotsky, 1978). The source of support is traditionally linked to a competent partner. In a school context, such a partner can be found in fellow students or a teacher. A competent partner is not necessarily required to possess an overall higher competence than the learner. A

fellow student who has reached a higher level of competence in a particular topic or subject may be a competent partner in a particular learning context.

Wood et al. (1976) coined the term *scaffolding* to describe the socio-cultural learning relationship between a competent partner and the learner. They argued that the support from a competent partner acts as scaffolding around the learner with the aim of reaching a point where the learner can put their competence to use independently, and one can "remove" the scaffolding. Through scaffolding, the learner may reach an understanding or competence that would not be possible without the help of a competent partner. Students' learning effects can be enhanced through interaction and exploration with peers as well as teachers. The presented perspective on learning can be understood as an emphasis on the teacher's role in the students' development of competence.

The present thesis focuses on one central aspect of the teacher's role, which is to assist the learner in integrating strategies into their learning process. To assist the student towards independent strategy usage in language learning, the teacher is dependent on sufficient competence in the didactic and pedagogic topics such as language learning, reading strategies, and digital skills. The teacher can then scaffold the student in the zone of proximal development. Strategies for reading and language acquisition, in general, may serve as tools for developing the students' competencies.

Tools play a central role in the learning process (Vygotsky, 1978). The socio-cultural theory refers to this aspect as *appropriation*, which can be understood as the development and usage of mediating tools (also called artifacts) when interacting with the world (Säljö, 2006). Mediating tools may be both physical and linguistic tools used to help in the learning process. Physical artifacts are made by people who have designed them for a special purpose. A digital textbook can be categorized as a mediating artifact in the socio-cultural learning process (Bikowski & Casal, 2018; Biltvedt & Bergheim, 2018). A digitized L2 textbook is developed to promote the students' competence in the L2 and contains both physical and linguistic tools.

Thorne (2003; 2016) asserts that tools and how culture influences their use are crucial to learning: "The design of the tool as well as the habitual patterns of its use influence the purposes to which it is put and methods by which it is used" (Lantolf et al., 2015, p. 209). A culture of use is shaped by how a tool (or artifact) is utilized. Bikowski & Casal (2018) argue that a digitized book offers an example of this, as it can fit into a personal or academic culture of use. Thorne (2003) discovered that a learner's prior artifact-mediated activity could help or hinder their future learning activity. These cultural artifacts gain power in specific contexts.

As a result, critical academic engagement with a mediating learning artifact, such as digitized L2 textbooks, may result in increased feelings of engagement and positive educational outcomes. However, the increased engagement and positive outcomes cannot be expected to occur naturally and can benefit from teacher guidance and peer discussions (Bikowski & Casal, 2018).

2.1.1 Language as a mediating artifact

Language as a tool is elementary in the socio-cultural perspective because it is an important contributing factor in order to learn in a social context (Säljö, 2006). Learning involves developing a *professional language* within the subject (Gilje et al., 2016). A learner's *professional language* refers to the development of specific words and a general language to express the content and thought processes of a subject (Gilje et al., 2016). A learner's professional language may vary depending on the curricular topic and will likely differ from their everyday language. For example, exploring science-related topics may require a different vocabulary than exploring English literature topics. A professional language is like any language, rather a continuous process of development than a fixed proficiency level.

A professional language will generally be acquired in a learning environment of a particular subject, e.g., in a classroom. The participants, the teaching materials, and the learning resources accessible all contribute to the learning environment (Biltvedt & Bergheim, 2018; Gilje et al., 2016). For this thesis, such a learning environment would be the English classroom. The development of language plays a crucial role in the subject of English. Learning material such as the L2 textbook is therefore likely to influence the students' learning environment. Language, as a mediating artifact, plays an important role in the mediating functionality of an L2 textbook. As a result, it may be necessary to provide teacher guidance also when attempting to get students to identify with this linguistic artifact. From a socio-cultural perspective, learners must identify with the tools they use to make them create meaning and promote learning (Säljö, 2006). This is the case for both the printed L2 textbook and the digitized version.

2.1.2 The teacher's role from a socio-cultural perspective

The teacher's role in the *zone of proximal development* is prominent in relation to both language learning and digital skills. Therefore, it is highly relevant to research what may influence the teachers' role in scaffolding and the ZPD. The socio-cultural perspective outlines the importance of identifying with the mediating artifact to create meaning and promote

learning. It is possible that identifying with the artifacts is as important for the teacher as it is for the students. How the teacher perceives a digitized textbook could possibly influence their role as a competent partner in the scaffolding process with the students.

Research on the use of digital teaching material across subjects indicates that teachers have a high degree of autonomy when selecting didactic material (Gilje et al., 2016). Autonomy is essential to allow each individual teacher to adapt their teaching practices to the learners' needs. With such a wide range of possibilities, it is yet to see what influences the teachers' decisions regarding digitized textbooks. As mentioned in Chapter 1, the digitized textbook has been investigated in a Norwegian context but without a clear emphasis on didactical matters (Biltvedt & Bergheim, 2018; Ødegård, 2017). The purpose of the learning process, that is, what the learner is moving toward, is a key aspect of the zone of proximal development. Consequently, the socio-cultural perspective on a digitized textbook suggests that a mediating artifact is best understood in relation to its specific aim and its socio-cultural context. Using a digitized textbook in an EFL classroom has a different purpose and socio-cultural context than when studying any other subject.

To fully understand the advantages and challenges of digitized material, it is crucial to define its purpose. The purpose of the EFL textbook is to scaffold the students in developing their English proficiency. This purpose is not altered by the digitized format of the textbook. The DTs does, however, present a different approach to scaffolding the students.

2.2 Language Learning Strategies

The Norwegian core curriculum presents *learning to learn* as one of the core principles for education and the overall development (The Norwegian Directorate for Education and Training, 2019d). Consequently, *learning to learn* is an essential part of all subjects. The core principle is also in line with the central learning perspective of the renewed curriculum, *deep learning*. The term *deep learning* is a complex term that numerous scholars have attempted to define, both before and after it was introduced to the renewed curriculum in 2018. For the purpose of this thesis, the Norwegian Ministry of Education and Research definition of deep learning has been selected. This definition was included in the guidelines for developing the renewed national curriculum. The included definition is the following:

The gradual development of knowledge and lasting understanding of concepts, methods and contexts in subjects and between subject areas. This means that we reflect

on our own learning and use what we have learned in different ways in known and unknown situations, alone or with others.

(The Norwegian Ministry of Education and Research, 2018, p.9, my translation)

The Norwegian Ministry of Education and Research's definition values continuous learning that allows the students to experience that their knowledge is versatile, both within a subject and on interdisciplinary topics. To achieve this, the learners need to reflect upon their individual learning, and they should be given various opportunities to use their knowledge.

2.2.1 Defining language learning strategies

The development of knowledge and lasting understanding that can transfer both across subjects and outside the classroom, can in the L2 classroom be related to language learning strategies. *Language learning strategies* (LLS) are strategies specifically aimed at the learning a language (Ranjan & Philominraj, 2020). Not only can the strategies be applied to languages and subjects other than English, but the ability to understand one's subjective learning may transcend a single aim of the course. The Norwegian curriculum of English includes explicit competence aims of strategy use in the language learning process already after the 7th grade. The students' knowledge about strategies and use of such, is expected to progress throughout the lower secondary and upper secondary.

The concept of language learning strategies has been found to be notoriously challenging to define (Oxford, 2017). The degree of complexity and detail included in definitions of language learning strategies has varied (Gregersen & MacIntyre, 2014; Oxford, 2017; Rubin, 1975). In 2011, Rebecca Oxford published her contribution to defining LLS in an attempt to bring order out of what she argued was a "chaos regarding learning strategy definitions and learning strategies as a whole" (Oxford, 2017, p. 8). Oxford (2017) presented the following definition:

Complex, dynamic thoughts and actions, selected and used by learners with some degree of consciousness in specific contexts in order to regulate multiple aspects of themselves (such as cognitive, emotional, and social) for the purpose of (a) accomplishing language tasks; (b) improving language performance or use; and/or (c) enhancing long-term proficiency. Strategies are mentally guided but may also have physical and therefore observable manifestations. Learners often use strategies flexibly

and creatively; combine them in various ways, such as strategy clusters or strategy chains; and orchestrate them to meet learning needs. (p. 48)

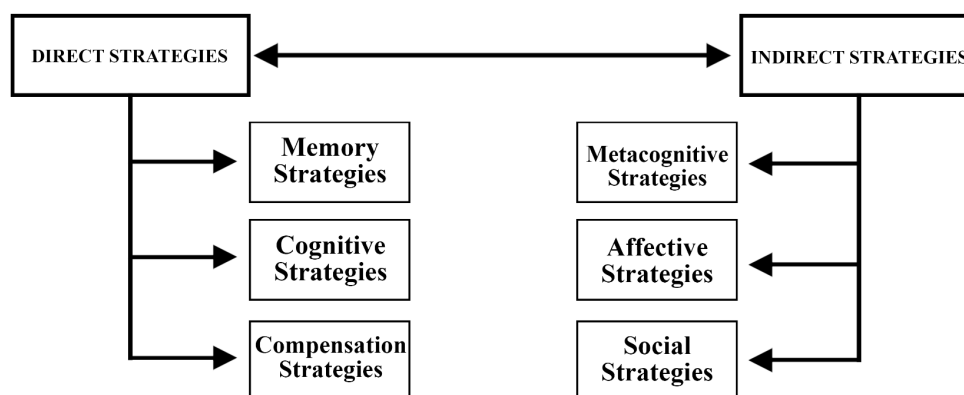
Though not unchallenged, the definition offered by Oxford is widely used within research on LLS (Amerstrofer, 2018; Rajan & Philominraj, 2020). The definition acknowledges the complexity of LLS and that they may serve different purposes. It is also evident that the strategies may have both mental and physical manifestations. As LLS have physical, and therefore observable manifestations, it is possible that a teacher can to some extent observe when strategies are advantageous or challenging. A digitized textbook can, to some degree, have integrated tools that may assist strategy use in the L2 classroom. Due to the level of detail and complexity of Oxford's (2017) definition is particularly suited for this thesis. Within the definition offered by Oxford, the language learning strategies rely on further differentiation. The following subsection will elaborate on the distinction of LLS offered by Rajan & Philominraj (2020). This refines what language learning strategies are understood to be throughout this study.

2.2.2 Categories of language learning strategies

Language learning strategies can be categorized into two main groups: *direct* and *indirect strategies* (Oxford, 1990; Rajan & Philominraj, 2020). *Direct strategies* are divided into three categories: memory strategies, cognitive strategies, and compensation strategies (Rajan & Philominraj, 2020). The *direct strategies* represent strategies that directly involve the target language being used (Oxford, 1990). Whereas the *indirect strategies* represent strategies that are necessary or helpful for learning the target language, despite not involving the language (Oxford, 1990). The indirect strategies fall into the following three categories: metacognitive strategies, affective strategies, and social strategies (Rajan & Philominraj, 2020). The categorization of direct and indirect language learning strategies does not offer extensive detail on each category of LLS but provides a sufficient overview of the topic. There are LLS classification models available that further elaborate on each category (Rajan & Philominraj, 2020). However, for the purpose of this thesis, a simplified model based on Rajan & Philominraj's (2020)'s classification, is selected:

Figure 4

Classification of language learning strategies



All the presented language learning strategies may apply to the basic skills that the curriculum of English includes. Both the productive skills such as speaking and writing, and the receptive skills such as listening and reading. Considering the scope of this thesis, a natural limitation of the LLS would be strategies concerning reading. The study will therefore focus on digitized textbooks' potential to foster students' reading skills. The language learning strategies provide a conceptual starting point for understanding reading strategies. The following sub-chapter will present relevant theory on *reading strategies* in detail.

2.3 Reading Strategies

Brevik et al. (2020a) argue that the understanding of *learning to learn* in the curriculum enhances “the strategies students can use for acquiring, sharing, and evaluating their knowledge as it grows in response to what they learn from reading texts” (p. 137). The strategies used for reading texts are referred to as *reading strategies* and can be defined as specific methods that assist a reader in overcoming difficulties in comprehension while reading, both with and without assistance (Brevik, 2015). The specific interaction and involvement with written language of reading strategies are what differentiates them from language learning strategies in general. Because the aim is to improve reading comprehension, it's critical to understand what constitutes reading comprehension.

Reading comprehension has long been considered a key part of developing language proficiency when interacting with authentic texts (Brevik et al., 2020). The scholarly understanding of reading comprehension has, however, changed and developed over time. In

the years leading up to 1975, the text-centered approach was the prominent perspective within research on reading. It relied on the “bottom-up” (i.e., word-recognition) and a “top-down” - perspective on reading (i.e., language comprehension) (Brevik et al., 2020a). During the 1990s, there was a shift towards a more dominant focus on readers, acknowledging the influence context may have on reading (Brevik et al., 2020a).

More recent research has provided a more nuanced understanding of reading comprehension (Brevik et al., 2020a; Snow, 2002). The RAND Reading Study Group model described reading comprehension as: “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (Snow, 2002, p. 11). The use of the words “extracting” and “constructing” are specifically chosen to highlight “both the importance and the insufficiency of the text as a determinant of reading comprehension” (Snow, 2002, p. 11). In contrast to the definitions presented up to 1975, the RAND Reading Study Group model represents a more elaborate understanding of reading comprehension (Snow, 2002). The model recognizes the complexities of influencing elements such as the text, the reader, the context, and the activities applied (Snow, 2002).

A key aspect of the presented reading comprehension model is that the different elements do not work individually, but as co-dependent parts of an interactive process. While the RAND Reading Study Group was primarily focused on L1 reading, Brevik et al. (2020) argue that the reading of L1 and L2 share several similarities. They underline that the reading of L2 naturally is more complicated. The added complexity is mainly due to the co-existence of L1 and L2 in the learning process of an L2. Reading in a second language is an interactive process in which the reader compensates for a lack of understanding in one area by drawing on abilities in other areas (Bernhardt, 2011).

Previous research has suggested that the reading proficiency in the L1 may influence the proficiency in the L2 (Hellekjær, 2005; Ibsen, 2004). Hellekjær (2005) points out that “poor L1 [reading] proficiency could hinder the transfer of skills and strategies to the L2” (p. 185). According to Hellekjær's (2005) findings, the students that had tested as “good readers” in the L1, could be amongst the poorest in the L2. There appeared to be no guarantee that a proficient reader of their L1 will be able to transfer their skills and strategies to the L2.

In contrast, recent research has found a positive relationship between reading proficiency in L1 and L2 among upper secondary Norwegian students (Brevik et al., 2016). These findings do, however, not eliminate the complex nature of L2 reading. To elaborate on this notion, it is also important to draw a distinction between reading skills and reading strategies. Reading skills are automatic actions, allowing the reader to decode text, usually

without much awareness (Afflerbach et al. 2017). Reading strategies have been established as strategies that are consciously employed to improve comprehension and reading skills. Reading proficiency in a second language can benefit from explicit teaching of reading strategies and sufficient practice (Brevik, 2020a; Hellekjær, 2005; Ørevik, 2020b). Through explicit instructions and tasks about reading strategies, the teacher can scaffold students' development as strategic readers (Brevik et al, 2020a; Wood et al., 1976).

A competent reader has been found to be an active reader, with a clear goal for their reading, making conscious choices related to strategies and types of text, as well as using their prior knowledge (Duke et al., 2011). Ultimately, the essential competence of a strategic reader is to understand not just how to use reading strategies but also when and why to use them. To promote strategic readers, Brevik et al. (2020a) argue that reading strategies should be practiced through a gradual release of responsibility. The gradual release of the responsibility model was first introduced in 1983 by Pearson & Gallagher, and they relied on a sociocultural perspective for developing strategic readers. The learner will first be scaffolded by the teacher through modeling and guidance and gradually be challenged to use the strategies more independently. In this process of developing strategic readers, the teachers and students share responsibility for the students' use and engagement with reading strategies (Brevik et al., 2020a). Although the responsibility is shared, the development process starts with a great responsibility on the teacher.

2.3.1 Teaching reading strategies

According to Brevik et al. (2020a), teachers have been found to successfully teach students about strategies and how to use them, consequently transmitting declarative knowledge and procedural knowledge (Brevik et al., 2020a). Nevertheless, teachers have been found to struggle with "how to talk about when, where, and why to utilize particular strategies; this is especially true as L2 readers move from one to another stage of language acquisition" (Brevik et al., 2020, p. 155). Considering Brevik et al.'s (2020) conclusion, it is apparent that more research on teachers and teacher cognition may be beneficial in evaluating the potential of various didactic materials. It may also help enhance the understanding of the strategies that may be used with them. The use of digital texts in the classroom, either on the internet or in a textbook, adds a new layer to the "when, where, and why" of reading strategies. How teachers understand the differences and similarities between printed text and digital texts will most likely be reflected in their teaching of reading strategies.

2.3.2 Some prerequisites of teaching reading strategies

There are several criteria that must be met before teaching reading strategies can contribute to developing students into strategic readers. Brevik et.al (2019) highlight specifically four criteria: sufficiently challenging texts, adequate time, reading motivation, and access to a variety of reading strategies (p. 65). The present thesis focuses on access to various reading strategies, but the effects of reading motivation and time consumption are also aspects to consider when looking at digitized L2 textbooks. The criterion of sufficiently challenging text will not be discussed in terms of textual content. Nonetheless, the digitized text format can be argued to bring a challenging aspect to reading. As teachers have been found to struggle with how to talk about when to use certain reading strategies and to communicate their specific purpose, this is something that warrants further exploration.

Reading strategies are generally not good or bad in and of themselves; the utility value is first defined when the strategy is applied to solve a specific task, e.g., to understand a specific text (Brevik et.al, 2019b). On-screen reading and online reading are some of the purposes for strategy use that the students may find helpful. The reading strategies used could again be further tailored to suit different text genres. As a result of creating an awareness of the differences between reading on paper versus digital screens, and how prior knowledge about reading strategies can also be applied to this format, students may reflect upon knowledge they can transfer from one subject to another. This type of reflection relates to the overall learning perspective of deep learning.

Another important attributing factor is how the reading strategy is combined with other reading strategies. Every reader possesses a different set of prior knowledge and experience with text genres, which generates individual needs. The use of reading strategies has proven to be beneficial for improving reading comprehension (Brevik, 2019a). However, the teaching of reading strategies does not promote a strategic reader alone. It is crucial that the students deliberately choose to adopt a reading strategy in order to correct a comprehension difficulty, and they must experience how using the approach helps them understand components of a text that they would not have understood otherwise (Brevik, 2019a).

Making the students identify with the tool is essential to create meaning and learning when teaching reading strategies through a gradual release of responsibility (Säljö, 2006; Brevik et al, 2019b). A "good" reader was not found to use a lot of different reading strategies but tends to make a deliberate choice to use a few strategies that work for them (Brevik, 2019a). The context in which the reader encounters a text may, however, challenge their

knowledge of reading strategies. Within the next sub chapter, I will examine what existing research indicates both the digital reading context and the printed reading context.

2.4 Reading on Screen versus Paper

In both practical and theoretical terms, the digitization of the EFL classroom has resulted in changes (Ørevik, 2020a). Reading is no exception to the influence of digital technology on the EFL classroom. Internet browsing and general on-screen reading have become a significant part of curricular work (Ørevik, 2020a). Reading digital media has arguably become an unavoidable part of the English subject as the development of digital skills has become an established curriculum aim.

From a didactical point of view, debating whether the digitization of the world that eventually reaches the EFL class is positive or negative, could be considered essentially pointless. ICT is a respected and undeniable component of both society and school, according to the revised curriculum that guides overall development in the subject of English and the Norwegian school system (The Norwegian Directorate for Education and Training, 2019a). As a result, it is more useful to examine individual digital tools, their advantages, and limitations, and when they are appropriate instruments for achieving a specific goal. Digital tools, like reading strategies, are most effective when one knows when to use them. Digitized L2 textbooks present a digital tool for the reading and reading strategies in the EFL classroom.

The attention DTs have received in the media argues that there is a substantial difference between reading on paper and on a screen (Brekke, 2021; Brochmann, 2020; Ditleifsen & Hamre, 2020; Krogh, 2022; Nilsen, 2021; Rørvik, 2022). In the following subsection, I will explore what the research indicates about a possible distinction between reading on paper and reading on screen. In addition, I will examine the research's implications for students' reading.

2.4.1 The future of reading

In 2019, the findings of the four year-long European research project COST E-READ Stavanger Declaration about the future of reading were published (E-READ, 2019). The research project was led by Professor Anne Mangen, one of the foremost Norwegian researchers on reading. The scope of the project was to investigate the differences between reading on paper versus screen. The study was not subject-specific but offers some overarching findings on the reading formats. A child's individual learning prerequisites were emphasized as a key affecting factor in a child's ability to use and learn through digital or

printed formats. Digital texts were found to offer opportunities for a customized text presentation that caters to individual preferences and needs. This customization may offer a positive influence on both understanding and motivation. This potential for promoting motivation due to customization has previously been linked to DTs and language learning (Bikowski & Casal, 2018). However, the digital formats entail challenges as well.

According to the declaration, readers are more likely to overestimate their own understanding when reading on a digital platform versus printed, especially under time-pressure. Several researchers have argued that reading on screen entails a bigger cognitive load (Anderson, 2003; Coiro, 2003; 2015). The demanding nature of reading on screen can lead to more skim-reading and a lower concentration on the content (E-READ, 2019). The overestimation may cause students to move forward in their learning process on fragmented understanding that ultimately can cause them to encounter difficulties later. Such encounters may consequently have a negative effect on their motivation. The reading of shorter texts showed no significant difference between the two formats (E-READ, 2019). Whereas in terms of reading longer texts, both informative and narrative, the comprehension was found to be better on paper as opposed to screen. The research group also found that despite the expectations of *digital natives*, the negative effects in relation to reading on screen versus paper have increased with time. The increase has occurred independently from factors such as age and experience with ICT.

These findings suggest that the usage of both digitized and printed material involve different advantages and challenges for different purposes. Thus, what didactic approach should be applied would depend on the reading format. The individual teachers, as well as the pedagogical team, should be aware of the implications of the formats. The selection of reading format should be based upon curricular aims as well as their didactic competence.

2.4.2 Recommendation for digital formats

One of the recommendations offered by Mangen and her colleagues was that students should learn strategies they can use to master deep-reading and other complex reading processes on digital formats (E-READ, 2019). Brevik's (2019a) criteria of access to a variety of reading strategies to develop strategic readers are consistent with this recommendation. It is also recommended that students are encouraged to read printed books and that teachers are aware of the significance the format may have on their students' reading. These recommendations indicate that inclusion of a digitized L2 textbook in the classroom requires an enlightened practice of reading strategies that caters to the digital format beyond the

conventional reading strategies. It also underlines that schools that only use digital L2 textbooks, should consider the value of additional printed text reading for the students.

Research suggests that the digital format is less beneficial for the reading of longer texts, both fictional and factual texts. Especially complex reading processes, such as deep reading, are more challenging to achieve while reading on screen (E-READ, 2019). As a result, it may be intuitive to favor the printed format for such reading in the EFL classroom. The importance of deep reading of literature in the English subject has been established as essential for developing both intercultural competence and complying with the overall goal of *Bildung* (Hoff, 2013; Hoff, 2014). The students' reading processes are essential to facilitating curricular aims beyond the basic skill aim of reading. As reading on paper has been argued as more suitable for such learning, teachers might be inclined to choose only printed formats when facilitating reading of longer text and/or deep reading. However, by avoiding more challenging texts in digital formats they run the risk of leaving students lacking essential skills when encountering such reading later.

The EFL classroom should prepare students for reading both formats, even though it may be more challenging than exclusively choosing the format that research has found to best suited for the task. Digital texts are essential information sources in the 21st century and can therefore not be opted out (Strømsø & Bråten, 2008). For the students to make good use of digital texts such as digitized textbooks, there are specific digital literacies required (Auer, 2016). In the following sub section, I will offer details on the status quo of 21st century readers, what digital literacy is and how this connects to reading strategies.

2.4.3 Strategic readers in the digital age

To bring readers into the digital age, it is necessary to understand the current state of the developing readers. In 2021, PISA published their findings on 21st century readers when assessing 15-year-old students' development of reading skills to navigate what they refer to as "the technology-rich 21st century (OECD, 2021, p. 5). One of the research's background findings was that 15-year-olds appeared to be spending an increasing amount of time on the Internet. Between PISA 2012 and PISA 2018, the average time spent on the Internet in the OECD countries had increased from 21 to 35 hours per week. As the students spend more time on the Internet, both at home and at school, they are continually exposed to an information flow and a complex environment to maneuver. The text encounters are diverse and may offer challenges for students. The PISA report presents a reality where the

development of *digital literacy* is in demand. The following subsection will expand upon what defines the term *digital literacy*.

2.4.4 Digital literacy

To become strategic readers in the digital age, the learners must develop skills to face the increased information flow of the internet. In the PISA report, *digital literacy* is defined as the skill set necessary in the technology-rich 21st century. Since the 1980s, attempts have been made to define and operationalize the concept of digital literacy (Buckingham, 2015). Buckingham (2015) draws upon *media literacy* when defining *digital literacy* as he argues that digital literacy goes beyond simply possessing the bare minimum of skills required to work efficiently with software tools or in performing basic information retrieval tasks. *Media literacy* considers the following four components: 1) representation, 2) language, 3) production and 4) audience.

According to Buckingham (2015) this approach to literacy allows for the inclusion of bias and reliability concerns but does so within the context of a broader concern with representation. Other areas of examination include visual and verbal dimensions, and an analysis of the commercial and institutional interests at stake. Ultimately, developing such literacy requires a reflexive understanding of how “these factors impact on the user – how users are targeted and invited to participate, what they do with the medium, and what they find meaningful and pleasurable (Buckingham, 2015, p. 27). The current understanding of digital literacy necessitates a broad set of skills from the reader, confirming that a strategic reader in the 21st century may need more extensive strategies than if print were the only media.

The PISA report establishes that Norwegian students had above average access to computers and the Internet both at school and at home compared to the other OECD countries (OECD, 2021). However, the Norwegian students scored below average on 1) being able to distinguish facts from opinions and 2) being able to detect whether the information is subjective or biased (OECD, 2021). Both aspects have become increasingly challenging in what the PISA report refers to as a “post-truth” climate we find ourselves in today where algorithms that “sort us into groups of like-minded individuals create social media echo chambers that amplify our views and leave us insulated from opposing arguments that may alter our beliefs” (OECD, 2021, p. 3). This leaves the students to process information and establish “truths” in a digital environment that may manipulate the process.

It is important to note that these findings are based on younger students than the students whom the respondents of this thesis teach. The age difference may include a

difference in training of critical thinking and assessing sources. Hence, it is not directly relevant to the target population of this thesis: teachers of English in upper secondary schools in Norway. Nevertheless, it might offer some indication of the students' digital literacy as they enter the upper secondary school.

When teaching reading strategies for digital forms, teachers must address the increasing complexity of reading that has resulted from digitization. The research has suggested a differentiation between reading on screen and on paper. Teachers are thus left to consider how this difference manifests itself in reading strategies. A strategic reader in the 21st century needs to develop an independent usage of reading strategies that go beyond the curricula and L2 textbook, and across formats. One of the desired outcomes of all education is an implementation of the individual learner's competencies and skills in society. Therefore, it is of interest to explore reading strategies for the "real" digital world: the Internet.

2.4.5 Online reading and reading strategies

Online reading typically consists of three types of texts: (1) non-linear hypertexts, (2) multiple media texts, and (3) interactive texts (Coiro, 2003). These three text types all represent the aspect of *multimodality*. Studies on language learning are increasingly considering *multimodality* as a key aspect of didactic material and EFL learning (Diamantopoulou & Ørevik, 2022; Skulstad, 2020; Weninger, 2020). The term refers to "simultaneous use of several modes¹¹ of communication" (Skulstad, 2020, p. 257). Multimodality is not exclusive for the complex online text formats but a characteristic that most texts share (Alexander, 2012; Skulstad, 2020). Both the printed version and the digitized version of an L2 textbook can be classified as multimodal. However, the digitized textbook represents an increasing number of modes, when the integrated functions are being used.

The added modes of DTs may hold affordances¹² for language learning such as audio support or in-text glossaries. The feature of audio support may be beneficial in other subjects but is particularly useful in EFL classrooms. Through the additional mode of audio, it provides an encounter with the L2 beyond written text. Thus, making use of both reading and listening skills to engage with language. Instant glossaries may provide the learner with more

¹¹ Modes of communication means "a socially shaped and culturally given semiotic resource for meaning making" (Kress, 2010, p. 79). E.g., written text, photos, video, gestures, music or sounds, speech, objects (Skulstad, 2020).

¹² Affordance refers to the potential uses of a given object (Gibson, 1979). Their affordances result directly from their observable properties. The affordances noticed by different observers could, in fact, differ, depending on their needs and interests, as well as the specific circumstances of the situation at hand.

opportunities to draw upon L1 knowledge to understand a text. These functions require the user to both be aware of them and have the adequate competence to make use of them. This is true for both students, and teachers. To make good use of the integrated functions, the students are not only dependent on a certain level of digital competence but also a repertoire of reading strategies.

Although text accessible via the Internet lacks the same integrated functions as DT, external digital tools are available. Perhaps through sufficient practice with supporting tools in DTs, the students will become more inclined to support their online-reading with similar tools. All three text types of online reading all may benefit from additional strategies, for example knowing when to use hyperlinks and when to ignore them or revisit them later.

According to Brun-Mercer (2019), online reading requires the same bottom-up skills and top-down processes print reading but include three major differences: (1) the vast volume of information, (2) a great deal of information online is not fact-checked or is published by a source that may not be reliable, and (3) online reading is not linear (p. 3). These differences represent challenges for the learners that cannot be understood isolated but in connection with the individual learner's prerequisites.

Brun-Mercer (2019) argues that strategy training and practice helps learners overcome the challenges of reading online and become digitally literate. Such training begins with instructor modeling (Brun-Mercer, 2019). Instructor modeling can ensure that the students gain an understanding of the implementation as well as why it is useful. It is crucial that the students are offered sufficient practice reading digital texts. Reading print text does not guarantee any improvements with reading digital texts (Brun-Mercer, 2019). Brun-Mercer (2019), like E-READ (2019), suggests that students read both digital and printed texts.

The digitized L2 textbook has been argued to hold potential as a gateway between the linear and reliable printed L2 textbook and the vast information flow of the Internet (Bikowski & Casal, 2018). Perhaps the digitized textbook can offer an arena for instructional modeling that can gradually move towards offering the students more autonomy when selecting and using reading strategies. This scaffolding will also benefit from being complemented by reading activities beyond the textbook. The students need training in the non-linear reading experience of online reading as well. Reading online introduces new challenges (Anderson, 2003; Coiro, 2003).

The most common online reading strategy among L2 learners has previously been found to be problem-solving strategies (Anderson, 2003). Strategies such as re-reading challenging content, slowing down the reading pace, and allowing oneself to think about what

one is reading (Anderson, 2003). This type of reading strategy is not exclusive to online reading, but perhaps a strategy more commonly needed when encountering texts with the added complexity of digital formats. Bruner-Mercer (2019) argues that online readers are found to multitask and have difficulties concentrating. The challenges may disrupt learning, which could affect some students more than others. A central reading strategy type that can aid such challenges, is *meta-cognitive strategies* (Anderson, 2003). The *meta-cognitive strategies* are the strategies related to “the ability to reflect on what you know and do and what you do not know and do not do” (Anderson, 2003, p. 10).

Anderson (2003) proposes that if the teacher creates a learning environment where the students can reflect upon what happens during an online reading, their ability to learn might benefit. The awareness of the cognitive effects the reading format may have, may offer an opportunity to work with the overarching curricular goal of *learning to learn* (The Norwegian Directorate for Education and Training, 2019d). The awareness of different reading formats is relevant for both the reading of DTs and the reading online. Such an awareness should include advantages and challenges. However, only awareness may not be enough for the students to tackle the multifaceted challenge of on-screen reading (Anderson, 2003; Coiro, 2015; Brun-Mercer, 2019). Online reading requires the students to read purposefully and knowing how to avoid digital distractions (e.g., hyperlinks and advertisements) (Coiro, 2015). Although free for advertisements, several DTs are available through internet browsers and the books include various hyperlinks. As a result, the students can therefore still have access to social media and the distractions of the internet, as well as interruptions of reading due to extended material from DTs. Therefore, strategies may be a necessary element for both on-screen reading and online reading.

Brun-Mercer (2019) offers three concrete examples of strategies for the students to overcome the challenges associated with digitized reading. While the strategies focus on online reading, it has been argued that the reading of DTs has several characteristics in common with online reading. Firstly, *focus on the purpose*. The strategy includes the following:

- (1) clearly identifying the reading purpose (topic and search terms);
- (2) keeping that purpose in mind when evaluating the usefulness of a site or text; and
- (3) remaining focused on reading one text at a time, avoiding the distractions of unrelated texts, links, and advertisements on the same page. (pp. 5-6)

Secondly, *determine credibility*. The author argues that this strategy can be modeled through e.g.: website credibility lists or an organizer for credibility encouraging the students to evaluate aspects such as if the text presents an opinion or fact and if it is possible to verify the information presented. Thirdly, *consolidate information and keep track of the sources* which includes a recommendation of using a form for synthesizing information.

The suggested online reading strategies of Brun-Mercer (2019) share an overall resemblance to reading strategies applicable to printed text reading. However, there are some aspects that vary in how to perform them. The determination of credibility and consolidation of information may not be strategies used to the same extent when reading the course textbook. This is not to say that one should not encourage the students to critically assess the information presented in the L2 textbook. Distractions may also be more accessible in an on-screen context, making the use of reading strategies more challenging. Thus, how teachers are to instruct and model these strategies needs to reflect the complex reading context.

Alexander (2012) presents an interesting perspective on reading competence in the face of new literacies. The concept of reading may not require a revision to align with the current context (Alexander, 2012). The current context of reading will only represent something “new” temporarily, a trait of reading that is in fact not “new”. The author argues that the very nature of reading already recognizes “its multidimensional, developmental, and goal-directed nature, and that acknowledges the authored character of texts and the intentions of their originators” (Alexander, 2012, pp. 273-274). A competent reader needs to “quickly and effectively grasp the similarities, contradictions, and conflicts within the ideas and voices that informational deluge contains” (Alexander, 2012, p. 274). According to Alexander (2012), the reading competence that we teach our students should not have an expiration date but should be continuously relevant.

A competent reader will have the capacity to adapt to textual and contextual situations, regardless of the time. Hence, the reading of digitized textbooks and printed textbooks may not define two completely different landscapes but the complexity of reading competence. The strategies for the two formats do share similarities but also demonstrate differences. An awareness of the cognitive restraints that on-screen reading may impose on the learner can also increase the teacher's ability to support students when they encounter digital texts. Recognition of the influence of reading purpose, textual genre, and individual prerequisites is important to fully understand the reading context in which the students develop reading skills. The presented perspectives on DTs and reading strategies assign great responsibility to the

teacher. The teacher's inherently influential role in the promotion of reading strategies underlines the importance of considering teacher cognition and the teacher's ICT competence.

2.5 Teacher Cognition and Professional Development of ICT Competence

When working as a teacher, there are many factors to consider. To facilitate learning, the role requires the teacher to consider the individual learners as well as the learning group as a whole. This should be done in the light of their didactic and pedagogical competence. However, there are certainly many nuances to their didactic or pedagogical competence that shape their teaching practice choices. To fully understand what influences a teacher, it is valuable to consider what the teacher knows, believes, and thinks (Borg, 2008). The act of teaching is only partially observable, as the phase leading up to the visible teaching in the classroom involves cognitive processes that are not equally observable.

While making didactic decisions, the teacher must acknowledge curricular reforms, changes in educational traditions, and technologies (Lee, 2019). Through his model on teacher cognition, Borg (2008) suggests that contextual factors, practice in the classroom, education, and professional coursework may all influence a language teacher's cognition. The four categories of influence are grouped into pre-active, interactive, and post-active teacher cognitions (Borg, 2008). These four categories refer to the dimensions of becoming, being, and developing as a teacher. The different factors that influence teacher cognition cannot be seen in isolation but as part of a cluster of factors.

When attempting to understand aspects of language learning, it is crucial to invite the perspectives of teachers. From an observable perspective, a teacher may not include digitized textbooks in their EFL classroom, but when recognizing the teacher's beliefs, thoughts, and knowledge, their choice might be insightful and justified. This may also be true in areas other than didactic material. With the presented understanding of teacher cognition and its importance in language teaching, the teachers' role will be investigated in the light of ICT and professional ICT competence.

2.5.1 The teacher in the meeting with ICT

From the socio-cultural perspective, the teacher can be viewed as a learned partner. Andreas Lund (2019) links the teacher to the sociocultural perspective as he investigates how teachers perceive the impact of ICT on their EFL subject as well as their practice in technology-rich environments. Lund (2019) highlights the teacher's important function in

relation to the student and their endeavors in the zone of proximal development. This central role as a facilitator in the learning process is critical for all aspects of a student's education.

The curriculum serves as a guide to prepare students for a future where digitalization will continuously affect and transform the way we live and work. The curriculum aims to convey this through its inclusion of digital skills as one of the basic skills, as well as subject-specific aims such as "use appropriate digital resources and other aids in language learning, text creation and interaction (The Norwegian Directorate for Education and Training, 2019a). Teachers play a vital role as facilitators in assisting the students' development to keep up with the digital world.

As a consequence of a renewed curriculum, what teachers need to teach their students in terms of ICT may drift further and further away from what they have themselves been educated to do. A dissonance that can be linked to one of Lund's (2019) findings: "Teachers needed to teach in ways they were not taught to" (p. 150). Lund's doctoral study was first published in 2003, which could cause the findings to be less accurate portrayal of today's practicing teachers. Nevertheless, this research points out an important aspect of how rapidly the digital competence a teacher possesses might expire. Since 2003, technology has developed at an accelerating pace. As a result, teachers are increasingly needed to keep up with technology. To develop digital competence to reflect the current technologies is a challenging task. Especially as the teacher role may change faster than the attitudes of teachers (Lee, 2019).

2.5.2 The complexity of developing digital competence

According to the research, students born in the digital age may not necessarily master technology to the extent previously anticipated (Bennett; 2008; E-READ, 2019; Lund, 2019; Prensky, 2001). The digital competence of both students and teachers is influenced by a range of factors (Brevik et al., 2020b). As the digital natives appear to be a simplified assumption rather than an accurate term for the current student population, the teacher's guiding role in a technology-rich environment is evident.

Almost all Norwegian students have access to ICT, without necessarily possessing a broad set of digital skills (Brevik et al., 2020b; OECD, 2021). Brevik et al. (2020b) argue that the most important aspect of ICT in the English classroom to consider is that "it should add to the students' learning and development" (p. 44). An emphasis on this aspect offers a clear aim for teachers' inclusion of ICT in their practice. However, it does also create a demand for

teachers to have a level of competence beyond using digital tools themselves. They must be able to make choices anchored in didactical perspectives and research.

Røkenes & Krumsvik (2016) defined *digital competence* within the teacher's perspective as "the teacher/TE's [teacher educator's] proficiency in using ICT in a professional context with good pedagogic-didactic judgment and his or her awareness of its implications for learning strategies and the digital Bildung of pupils and students" (p. 2). Røkenes & Krumsvik (2016) offer a definition that explicitly links digital competence to pedagogic-didactic judgment and awareness regarding ICT's implications for learning strategies. The connection clarifies that the teacher needs to assess how learning strategies, such as reading strategies, interact with different digital tools. As discussed previously, the development of reading strategies in the classroom should be some version of a gradual release of responsibility (Brevik et al., 2020a). Gradual release of responsibility is a process that may benefit from a teacher's guidance and modeling, also when developing strategies for ICT environments. Biltvedt & Bergheim (2018) presented findings indicating that the teachers' perceived digital competence influenced how they used digitized textbooks in their teaching. These findings underline that the teacher's digital competence may influence their ability to offer guidance and modeling on reading strategies for on-screen reading.

2.5.3 The requirements for the teacher's ICT development

The teacher's digital competence and its role in students' learning and development is further confirmed through the findings of the British Educational Communications and Technology Agency (BECTA): "When teachers disengage from the use of technology and leave pupils to use it and teach each other how to use it, the potential for enhancing learning drops away steeply" (Dawes, 2001, pp. 64–65). Røkenes & Krumsvik (2016) found that teacher students that perceived themselves as "good with ICT" still experienced being unprepared to make good use of ICT in their teaching. Gudmundsdottir & Hatlevik (2018, p. 214) presented their findings on newly qualified teachers' professional digital competence, who reported "fairly poor quality and contribution of ICT training during their teacher education".

As recently as 2017, The Norwegian Center for ICT in Education aimed to address this gap between teachers and digital competence by developing a framework for *professional digital competence* (The Norwegian Directorate for Education and Training, 2017). The framework was created to highlight teachers' crucial role in implementing digitalization in schools and fostering digitally proficient students. *The Professional Digital Competence*

Framework for Teachers (PfDC) is a guide that includes seven different competence areas. All areas of competence are equally weighted. Thus, the sum of the competence areas makes up a professional, digitally competent teacher.

The competence area *subject and basic skill* is especially relevant to this thesis. It outlines that the teacher understands “how digital developments are changing and expanding the content of subjects” (The Norwegian Directorate of Education and Training, 2017, p. 5). The digitally competent teacher also understands “how the integration of digital resources into learning processes can help to achieve competence aims in a subject, and to address the five basic skills” (The Norwegian Directorate of Education and Training, 2017, p. 5). As reading is one of the five basic skills, an awareness of the digitized textbook’s potential regarding reading strategies could contribute to professional digital competence. A teacher’s digital competence should include sufficient skills that allow them to critically assess digitized textbooks and their affordances when developing students’ reading skills.

According to Ørevik (2020b), teachers in a digitized EFL classroom have a key role to play in guiding students toward selecting and evaluating texts. The teacher should offer the students criteria by which students can make informed choices for learning purposes. Reading strategies can contribute to such selection in encounters with texts in digital spaces. The PfDC argues that to achieve the mentioned digital competence area *subject and skills*, “the teacher needs to develop their own digital skills” (The Norwegian Directorate of Education and Training, 2017, p. 5). In addition, the teacher should understand what students’ digital skills entail as well as how to promote them within the subject curriculum. The research argues that the teacher is essential to the learning process of 21st-century students. The teacher, therefore, provides an intriguing delimitation to this thesis.

2.6 Summary

The presented theoretical framework has placed the digitized textbook from a socio-cultural perspective. The concept of language learning strategies has been elaborated and has demonstrated the role reading and reading strategies play in the EFL classroom. Further, there has been presented research arguing the difference and similarities between reading on paper and reading on-screen. Consequently, the teaching of reading strategies has been nuanced based on these findings. Ultimately, the role of teachers and their digital competence has been examined in relation to developing the students’ reading skills and digital skills. The presented theory makes it evident that teachers play a significant role in the development of strategic

readers, regardless of the format. The offered theory and previous research will be used to examine the present research question. The next chapter will establish the methodology for the present research project.

3.0 METHODOLOGY

This study aims to investigate how the EFL teachers perceive the digitized L2 textbook - and its potential for promoting reading strategies in the 21st-century classroom. The following research questions frame the research project:

RQ1: *What are the teachers' reported beliefs on the digitized L2 textbook's potential for promoting reading strategies in the 21st-century EFL Classroom?*

Sub research questions:

1. To what extent do teachers believe that the digitized L2 textbook has the potential for promoting reading strategies?
2. To what extent do teachers experience that they have adequate experience to teach reading strategies, on screen and on paper, with the same level of quality?
3. What are some advantages and challenges that teachers associate with the digitized L2 textbook when promoting reading strategies?

This chapter will present the applied research design and justification for the selected research material. Firstly, quantitative, and qualitative research methods will be defined. The presented theory on research methods will offer a rationale for the choices made for this specific thesis. Further, the research design will be presented in detail. Lastly, the methodological framework will be assessed for reliability, validity, ethical considerations, and possible limitations.

3.1 Research Methods

The present research project is carried out within the research tradition of *educational research*. Cohen et al. (2018) explain that educational research planning and implementation do not allow for a simple "read-off" to realize a study: "educational research, far from being a mechanistic exercise, is a deliberative, complex, subtle, challenging, thoughtful activity and often a messier process than researchers would like it to be" (Cohen et al., 2018, p. 3).

Educational research aims to address the problems and concerns within the education system and to look for potential solutions (Creswell, 2014). Research allows educators to gain a deeper understanding of their challenges and contribute to continuous improvement

(Creswell, 2014). The educational research tradition offers a variety of research methods. The different methods answer different questions (Cohen et al., 2018).

The present scope includes subjective aspects such as the beliefs and experiences of teachers. The research project aims to provide further insight into the debate about digitized textbooks. Such insight should go beyond singular opinions and experiences as such presented in newspapers or forums (Brekke, 2021; Brochmann, 2020; Ditleifsen & Hamre, 2020; Krogh, 2022; Nilsen, 2021; Rørvik, 2022). To collect such data, it was necessary to assess which method would be best suited.

3.1.1 Quantitative and qualitative research

Within the field of research, there is a general consensus that there are two distinct paradigms: *qualitative* and *quantitative research* (Brannen, 1992; Creswell, 2014; Morgan, 2014). The main distinction between the two paradigms is how they gather and process data.

Qualitative research is typically inductive, subjective, and contextual (Morgan, 2014). The research method is characterized by “exploring a problem and developing a detailed understanding of a central phenomenon” (Creswell, 2014, p. 30). The data collection of qualitative data is based on a small number of participants, offering a more detailed representation of the participants' views. Examples of qualitative research instruments are interviews and case studies (Creswell, 2014).

Quantitative research is typically deductive, objective, and general (Morgan, 2014). In contrast to the qualitative research method, quantitative research is characterized by a description of “a research problem through a description of trends or a need for an explanation of the relationship among variables” (Creswell, 2014, p. 27). Examples of quantitative research instruments are surveys and experiments (Creswell, 2014).

Between the two presented paradigms, there are research methods that make use of a combination of the presented methods. Combinations of quantitative and qualitative research typically either use the mixed-method approach or action-oriented research (Creswell, 2014). The mixed-method approach uses a combination of data to best understand and explain a research problem, whereas action research is when a combination of data is used for individuals to investigate education problems that they face in their setting (Creswell, 2014). The action-oriented research often includes an intervention aiming at quality improvement (Creswell, 2014).

To answer the thesis's research question, both quantitative and qualitative data were of interest. The main objective was to collect data from a broad representation of teachers,

without compromising the exploration of participants' views. Consequently, both quantitative and qualitative data were collected simultaneously through the use of a questionnaire. The following subsection will offer an elaboration on the rationale for the selected method.

3.2 Research Design

The overarching aim of this research project is to offer insights into how teachers of English perceive the digitized L2 textbook's potential for promoting reading strategies in the 21st-century. A survey was selected as a method for this research project to obtain a broad data set on the teachers' viewpoints on the use of digitized textbooks.

The thesis' focus on teachers' perceptions and attitudes, calls for qualitative data. However, the thesis was aimed to collect a larger data collection than what qualitative research methods such as interviews or case studies would allow within the timeframe for this research project. Consequently, a *cross-sectional survey design* was implemented. *The cross-sectional survey design* is characterized by collecting data at one point in time (Creswell, 2014). It enables the assessment of current attitudes, beliefs, opinions, or practices. Therefore, it is a suited approach for an exploration of the research questions.

The survey design is beneficial because it provides information in a short period of time (Creswell, 2014). A master's thesis is a time-constrained research endeavor, which should be taken into account when designing the project. It is important to “match what you need to know with the amount of time you have to find out” (Fink, 2003, p. 15). The time required to administer the survey and collect data was deemed manageable within the timeframe of the research project. The survey design would still gather the required data to sufficiently investigate the research questions.

Another advantage of a cross-sectional survey design is that it allows for comparison between groups. In the present study, these groups were defined by age, work experience, ICT competence, or personal reading format preferences. As the research question calls for both quantitative and qualitative data, the design of the questionnaire had to consider both research methods. The following subchapters will present details on the survey design and the development of the questionnaire. For a full overview of the questionnaire, see appendix 1.

3.2.1 Rationale for the selected method

Survey research would make it possible to reach more potential respondents and gather both the quantitative and qualitative data the thesis required. The survey is a heavily represented method within educational research and often makes use of questionnaires as

research instruments (Creswell, 2014). Questionnaires can offer data beyond a smaller selection of subjective cases (Creswell, 2014). This could secure a more nuanced understanding of how English teachers regard digitized textbooks. Surveys are primarily a quantitative method used to "generalize, offer an explanation or prediction" based on the collected responses (Castellan, 2010, p. 7). While survey researchers often correlate variables, their primary goal is to understand a population rather than to relate variables or predict its outcome (Creswell, 2014).

The educational research tradition often makes use of a combination of different data to gain a better understanding. For this thesis, only including quantitative data might result in a simplification of the teachers' viewpoints. Thus, it was deemed necessary to incorporate some qualitative data to sufficiently understand what the teachers believe and why they believe it. The survey instrument was assessed and adapted to allow a collection of both quantitative and qualitative data.

A questionnaire may include both close-ended questions and open-ended questions. A close-ended question is "a question posed by the researcher in which the participant responds to preset response options, e.g.: multiple choice answers or rating questions" (Creswell, 2014, p. 2). Close-ended questions would allow the teachers to express their attitudes by taking a stance on several statements and by answering multiple choice questions.

Open-ended questions allow the respondent to express themselves freely about a subject. Such questions aim to offer further insight and provide qualitative data (Creswell, 2014). Qualitative data was essential to gain sufficient insight into what the teachers think of the digitized L2 textbook and its potential for promoting the students' reading strategies. Thus, the questionnaire for this study included a combination of closed-ended and open-ended questions.

The purpose of this study was to identify upper secondary teachers' reported beliefs about digitized L2 textbooks' potential and challenges for promoting the students' reading strategies. As stated in chapter 1, the previous research on the DTs has generally made use of qualitative data in the form of interviews. Some research has also relied on a mixed-method approach, combining small-scale questionnaires and follow-up interviews. Both approaches are warranted within research on the subjective topic of teacher cognition. As the previous research had already presented in-depth perspectives on DTs, this study aimed to elaborate on that.

It was determined in the project's early planning stages that gathering a large enough sample to generalize or discover any distinct trends within the target population would be

difficult. Therefore, it was established that the data collection of the research project would only aim for an examination of trends within the sample, without any further attempts at generalization for the target population. It was nonetheless considered to be relevant data to the research question. The target population and sampling process will be further elaborated in the following subsection: 3.2.1 Target population and sampling.

Accessibility of participants was also an important factor when selecting the method for this research project. An electronic questionnaire was chosen to make the distribution more convenient. The electronic questionnaire could be distributed online, via mail to heads of departments in upper secondary schools. The heads of departments would have access to a sample of the target population and would be able to distribute the questionnaire. The electronic distribution would enable the inclusion of relevant Facebook groups. This would allow a broader reach, directly to possible respondents. The method was also assessed to be a more suited instrument to retrieve sufficient amounts of data during the covid-19 pandemic. After selecting the research method and instrument, it was important to determine who would be the subjects of my research project.

3.2.2 Target population and sampling

The data collection of the present research project included a *target population*. A *target population* is a refinement of the general population to secure a “group of individuals or participants with the specific attributes of interest and relevance” (Asiamah et al., 2017). The groups of individuals share some common characteristics that align with the scope of the research. This thesis appoints teachers as the relevant target population. Furthermore, the target population is narrowed down to English teachers in Norwegian upper secondary schools. However, the present research project does not allow for an investigation of all individuals in the target population.

Sampling is a commonly used method to make the research process more feasible within practical limitations such as accessibility and time frame (Cohen et al., 2018). The aim is for the researcher to secure a representative sample of the population to serve the thesis’ purpose. However, there is not only one technique of sampling. There are several methods to achieve a sample suited for a research project.

EFL teachers are a target population with a professional viewpoint on the L2 textbook as teaching material. Therefore, it was deemed suited to select respondents within this group. The type of sampling that handpicks the sample based on apparent typicality or possession of particular characteristic(s) is known as *purposive sampling* (Cohen et al., 2018). The

researcher needs to make an informed selection of participants who match the requirements of the current research project.

When the desired sample was defined, there were still some practical refinements to be made. There was no guarantee that every participant who was approached would agree to participate in the study. Therefore, *convenience sampling* was applied - the selection was made based on mere convenience for the researcher (Cohen et al., 2018). The method involves the researcher making use of the participants easily available. In this study, the heads of departments of 60 upper secondary schools were contacted and asked to forward a project invitation. The respondents of the purposive sample who decided to participate and completed the questionnaire made up the convenience sample for the research project.

3.2.3 Designing the questionnaire

The present survey consisted of a questionnaire in two sections: section 1 (S1) aimed to retrieve background information about the respondents, whereas section 2 (S2) aimed to glean information about the respondents' beliefs and attitudes to provide answers to the research questions. Each questionnaire section was introduced with an instructional page. The questionnaire included a total of 16 questions. Through pilot testing, it was established that the questionnaire took approximately 10-12 minutes to complete. The following subsections will elaborate on the variables that have influenced the survey's development.

3.2.4 Establishing the context of the survey

To form appropriate questions, the researcher must have a clear overview of the survey's context (Fink, 2003). There are contextual variables that should be considered when developing a survey and its corresponding instruments such as a questionnaire. The present study solely relied on the data collection gathered through the questionnaire. The reliance on the quantitative method emphasizes the value of a thoroughly developed instrument.

To establish the context that would influence the thesis' survey development, Fink's (2003) model for contextual survey overview has been applied. The model considers the specific variables of the survey and aims to outline their effects on the questionnaire items of the questionnaire. For the contextual overview in full, see Appendix 2.

The starting point for establishing the context of one's survey is "to fully understand the survey's purpose" (Fink, 2003, p. 8). The survey had to offer data that would allow an exploration of the research question. Consequently, the purpose of the survey was to identify

upper secondary teachers' reported beliefs about digitized L2 textbooks' potential and challenges for promoting the students' reading strategies.

As the sample included respondents who were all teachers of English, the questions could be written in English without risking that the respondents would not have sufficient language skills to complete the questionnaire. Language could be considered a barrier if the survey's purpose had involved more challenging topics that required highly specialized language. However, this was considered to not be the case for the present study. The questionnaire would be distributed electronically. Because the surveyor/researcher would not be present during data collection, the questionnaire had to be comprehensible to the respondents. The questions had to be clear and easily understood without additional assistance.

The electronic distribution was done through the online service *SurveyXact*. *SurveyXact by Rambøll* is a survey tool that allows the researcher to create questionnaires, distribute the questionnaire, collection of data, and corresponding analysis. SurveyXact was chosen as it complies with the guidelines of the University of Bergen for privacy. Keeping participants' privacy and safety was an essential part of the research project and will be described in detail in subchapter 3.6 Ethical considerations.

Timing is another central variable to consider when conducting a survey. The length of the questionnaire was kept to a minimum. Previous research has demonstrated that the longer the questionnaire is, the less likely respondents are to start and complete the questionnaire (Galesic & Bosnjak, 2009). The nature of this research project was dependent on a fair number of respondents to sufficiently explore the research question. Therefore, an effort was made to reduce factors that could hamper the respondent rate, such as length and ambiguity (Fink, 2003; Galesic & Bosnjak, 2009). As the questionnaire would retrieve some qualitative data it would require more time during the analysis of these items. To secure sufficient time for analysis of the qualitative data, the questionnaire had to be finalized within a reasonable timeframe before the end of the research project.

To summarize, purpose, respondents, surveyor, privacy, and timing are all a part of the survey context which need to be accounted for when developing a survey. Another variable to consider is what type of answers the questions invite and how they will be further presented and analyzed. The procedures of analysis will be presented in subsection 3.4. The following subsections will provide an overview of which items have been included in the questionnaire. Subsequently, the aim and rationale of the different items will be discussed.

3.2.5 Questionnaire items

The questionnaire included a total of 18 items divided across the two sections. The two sections included two instructional items. One on the first page of S1, stating the purpose of the research and some clarifications on essential information for filling out the questionnaire (see Table 1). The second instructional item was on the first page of S2. Each section included a combination of closed-ended and open-ended questions. The aim of S1 was to gather background information about the respondents. The aim of S2 was to gather attitudinal information about the respondents. An overview of the informational item and categorical background questions section 1 of the questionnaire is presented in Table 1 below.

Table 1

Questionnaire section 1 - Background information on the respondents

Item	Types of question	Number of items	Content
1	-	1	Survey information and instructions.
2, 3, 4, 6, 7, 8	Closed-ended, categorical	6	Background information on the respondents
5	Open-ended	1	Background information: explicit training in ICT use in teaching
Total:		8	(7 of 8 were questions)

As presented in the table, there were in total 7 questions that provided background information about the respondents. Out of these, 6 retrieved categorical data. One question was an open-ended question that would retrieve data that would be further analyzed. The first section of the questionnaire would provide potential groups to compare in the analysis. The questionnaire's second section included a total of 10 survey items. An overview of the

informational item and attitudinal questions in section 2 of the questionnaire is presented in Table 2 below.

Table 2

Questionnaire section 2 - Attitudinal variables

Item	Types of question	Number of items	Content
9	-	1	Survey information and instructions.
10, 11, 12, 13, 14	Closed-ended 5-point Likert scale: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, (5) strongly agree.	5	Beliefs about (1) DTs (2) RS, (3) DTs in relation to reading strategies.
15, 17	Closed-ended:	2	Beliefs about the challenges (15) and potential (17) DTs
16, 18	Open-ended	2	Elaboration of beliefs expressed on previous items: (15) and (17)
Total		10	(9 of 10 were questions)

The second section of the questionnaire consisted of 10 items, where 9 of those were questions. The questions were a variety of closed-ended and open-ended questions. A series of 5 closed-ended questions were answered by the measure of a Likert scale. Further, the different question types will be discussed in detail.

3.2.6 Background information: Categorical questionnaire items

The first seven questions were categorical questions that would provide background information about the respondents. These variables were the following: age group, preferences on reading formats, work experience as a teacher, experienced ICT competence, and explicit training in ICT use in the classroom. These categorical variables were included based on the factors that have been shown by previous research to influence teachers' use of ICT in the classroom (Biltvedt & Bergheim, 2018; Gilje et al, 2016; Lund, 2018; Røkenes & Krumsvik, 2016). Therefore, it was of interest to look for corresponding or contradictory trends within the data set of this research project.

The ICT competence of teachers is one of the determining factors when it comes to ICT use in class (Biltvedt & Bergheim, 2018; Gilje et al, 2016; Lund, 2018; Røkenes & Krumsvik, 2016). However, research has underlined that the teachers might evaluate themselves as proficient in ICT in their spare time but feel inadequate when using it to benefit their teaching practice (Røkenes & Krumsvik, 2016). To provide insight into the respondents' experienced ICT competence, it was essential to map their ICT competence beyond their profession. Using this data, it would be possible to assess whether respondents' professional and personal ICT skills are in accordance. To achieve this, the proficiency levels of ICT were based on the European Commission's *Digital Competence Framework for Citizens (DigComp 2.1)* (Carretero et al., 2017). The framework includes examples of all eight presented levels of proficiency. Overall, the levels included are four main levels that have been divided into two more nuanced categories. For this study, the questionnaire included the four main levels of proficiency: foundation, intermediate, advanced, and highly specialized.

The aim was to map the respondents' experienced ICT proficiency. However, as the respondents would be aware that the questionnaire targets aspects of their professional opinions it might cause them to express ICT competence that aligns with their perception of themselves as teachers. In an attempt to avoid an insinuation that the degree of ICT competence determined how "good" a teacher is in their profession, the respondents were asked which tasks they felt capable of completing, e.g.: "intermediate tasks (well-defined and routine tasks and problems, independent and according to my needs)" instead of simply labeling their own skill level as "intermediate" or "advanced". The different proficiency levels were presented with examples from DigComp 2.1 (Carretero et al., 2017).

The level labeled as "foundation" has been changed to "basic", as the term "foundation tasks" was assessed to potentially be confusing and unfamiliar to the respondents. It is

essential to create a questionnaire that is clear and avoids additional confusion that might influence the respondents' ability to offer their opinions (Einola & Alvesson, 2020).

Explicit training in ICT use in the classroom has been outlined as a key factor that continues to hold unrealized potential in both teacher educators and school leaders' practice (Gilje et al, 2016; Gudmundsdottir & Hatlevik, 2018). Therefore, it was interesting to see which explicit ICT training the respondents had received that they had any current recollection of. This information was collected by using an open-answer question. The received explicit training in ICT could vary substantially from respondent to respondent and would be challenging to categorize adequately beforehand. An open-ended question would allow each respondent to account for their subjective experience. The respondents were also asked to disclose which degree of experience they had with digitized textbooks specifically. The closed-ended question would offer data on whether the respondents communicated primarily predictions of the digitized textbook or experiences.

3.2.7 Close-ended questionnaire items

The second part of the questionnaire included five statements asking the respondents to express the degree of agreement or disagreement. The included statements are derived from the scope and theoretical framework of the thesis. The aim of these questionnaire items was to gather attitudinal data from the respondents. A Likert scale, scaling from “Strongly agree, agree, neutral, disagree, strongly disagree” was used to collect this data. Likert scales are commonly used instruments in questionnaires that examine “attitudes or perceptions related to a series of individual statements or items” (Spencer, 2015, p. 838).

The Likert scale is a measurement instrument that belongs to the close-ended question category. The respondents are presented with predetermined answers on a scale. Close-ended questions are convenient as it is not as demanding of the respondents as open-answer questions where they are asked to write freely (Dörnyei & Taguchi, 2009). Another convenience of close-ended questions is comparison. When respondents have the same options to choose from, comparing answers is easier.

Lastly, the respondents were asked two separate close-ended questions about whether they perceived any challenges and/or advantages with the digitized textbook when promoting reading strategies. The close-ended questions are multiple-choice questions providing a predetermined answer set, ranging from “Yes-To some extent-Uncertain-No”. These questions are followed by open-ended questions.

3.2.6 Open-ended questionnaire items

Open-ended questions were incorporated as a measure to gather qualitative data. The respondents were asked to elaborate their given answer on the previous statement. This type of open-ended questions is known as *clarification questions* (Dörnyei & Taguchi, 2009). The purpose of the open-ended questions was to offer further insight through qualitative data on participants' expressed opinions in the preceding questions. Answering questionnaires challenge respondents to express their opinions, and some might find it restrictive and challenging as they might not have well-defined opinions or be able to categorize them into the categories offered by the instrument (Galasiński & Kozłowska, 2010). Open-ended questions would provide the respondents with freedom of expression.

3.2.8 Distribution process of the questionnaire

To distribute the questionnaire to the target population of this research project, contact with various heads of departments was deemed necessary. The aim was to get respondents from different parts of the country as a measure to avoid a limited geographical representation. Therefore, an effort was made to contact heads of departments at schools in all eleven counties, both in rural and urban areas. Contacting heads of departments as opposed to teachers directly, would also secure that the respondents remained anonymous. The target population was EFL teachers of upper secondary, therefore the questionnaire was primarily distributed to heads of departments of upper secondary schools.

The distribution process was divided into three different stages: 1) contacting heads of departments of 30 upper secondary schools, 2) contacting 30 additional heads of departments, and 3) distributing the project invitation and survey on Facebook groups for teachers. The three stages were executed approximately a week apart from each other.

The questionnaire was distributed to the upper secondary school where I work. This requires some ethical considerations, which will be discussed in full in subsection 3.6.2.

3.2.9 Addressing low respondent rate

The initial aim was 50 respondents. Within the timeframe of the research project, it was considered to be an optimistic but plausible respondent rate. This number was considered sufficient to answer the research question, since the aim of the project was not to obtain a fully representative sample of the target population. Therefore, a selection of 60 upper secondary schools in Norway were contacted.

The distribution process ultimately led to 49 respondents, where only 39 completed. As the consent for participation was given by completion of the questionnaire, the 8 partially completed responses were excluded. The respondent rate was therefore lower than the initial goal. However, 39 respondents were deemed a satisfactory respondent rate to investigate the research question of the project. The number of respondents would still offer insight into a significant variety of teachers' beliefs about the topic.

3.4 Analyzing the Data

According to Dörnyei & Taguchi (2009), the first step of data processing normally includes converting the respondents' answers to “numbers by the means of coding procedures” (p. 84). Coding procedures within quantitative instruments such as questionnaires, differ depending on the questions (Dörnyei & Taguchi, 2009). Therefore, the following subsections will cover each of the three data types included: categorical data, attitudinal data, and qualitative data from the open-ended questions.

3.4.1 Analysis of categorical data

The categorical data retrieved from the questionnaire was initially analyzed by the data analysis software provided by SurveyXact. The data included variables such as age groups, work experience as a teacher/L2 teacher, personal preference of reading formats. All the variables were summarized in percentage and in exact numbers. The two first categorical questions were translated to vector grams. The purpose of this was to visually display the distribution of age group and work experience. These two variables were central to demonstrate any underrepresentation in the sample. The remaining categorical data was translated into bar charts. The use of bar charts was chosen as it displayed the variables and data in a nuanced manner. The different categorical variables were further assessed in the light of previous research findings in the discussion chapter. The respondents were asked to what extent they had experience with the digitized textbook. The multiple-answers available were ordinal variables, indicating some degree of frequency. The data would be translated into a bar chart as well.

3.4.2 Analysis of attitudinal data - Likert scale

The attitudinal questions where the respondents expressed degree of agreement or disagreement on a Likert scale provided ordinal categorical data. The data was processed through the software SurveyXact. The responses to these questions were translated into a bar

chart to be presented in Chapter 4. Analysis of data from a Likert scale question is normally a more straight-forward analysis process (Dörnyei and Taguchi, 2009). As it traditionally makes use of the 5-point division, the answers are easily numbered and therefore coded. The coding ranges from (1) strongly disagree, (2) disagree, (3) neutral, (4) agree and (5) strongly agree. The five codes served as categorization of the responses. Categorization of data is generally done to increase the ease of further analysis and discussion (Dörnyei and Taguchi, 2009).

3.4.3 Content analysis of open-ended questionnaire items

The open-ended questionnaire items were a central source of data in the investigation of the present research question. These questionnaire items represented qualitative data. A challenge of qualitative data analysis is the need for data reduction (Cohen et al., 2018). The researcher must start the analysis process by turning large data material into manageable and comprehensible sizes. The content gathered from the open-ended questions could potentially contain a great variation between answers. Some respondents might feel short answers suffice whereas some respondents might feel a longer response is appropriate. The open-ended instrument allowed both types of answers, and which variables this would include was difficult to predict. Therefore, the analysis procedure had to provide the researcher with a structure for interpreting the data. I aimed to keep the data analysis procedure as simple as possible. It was important that the data could be presented in a clear manner.

Creswell (2014) refers to this qualitative research process as a coding *process*. The researcher processes the text data by dividing them into segments, labeling the segments, checking for overlap and redundancy, and grouping segments according to themes (Creswell, 2014). There is not a specific tradition for coding qualitative data within education research (Cohen, 2018). The researcher is free to choose the coding that they consider to be best suited for the research. A data analysis software solution was selected for ease of analyzing qualitative data and for clear presentation. The qualitative analysis software *MAXQDA*¹³ was used. The data retrieved from SurveyXact was exported as three text files containing only qualitative data, one file per questionnaire item. The text files were then processed individually in the analysis software MAXQDA.

Firstly, the open-ended question regarding the respondents' explicit training on how to make use of ICT in their teaching was analyzed. The data retrieved from this question was

¹³ MAXQDA is a qualitative and mixed-method software that allows analysis of in academic, scientific, and business institutions. The software is considered to be reliable and provides the researcher with a variety of tools to process qualitative data.

coded with three possible codes: “Yes”, “Some” and “No”. For the purpose of further discussion, it was of interest to map an outline of how many of the respondents reported that they had received such training and how many reported they had not. A considerable number of teachers felt that it was necessary to emphasize the limited level of their training in ICT. Therefore, it was considered necessary to demonstrate this nuance in the affirmative responses. See Appendix 6A for a full overview of the code system. The occurrence of the three codes is presented in a bar chart in Chapter 4. The responses that included information about the explicit ICT training beyond “yes-some-no” were included as quotes as well. All quotes included in the results and discussion are referenced to the respondents' assigned number in the data set (See Appendix E for full numbered list of responses).

The questionnaire items regarding the challenges and advantages of teaching reading strategies and the use of digitized textbooks were color-coded and processed. Both items were analyzed for an explicit focus on students or teachers. The aim of this categorization was to gain insight into whether the respondents considered that the DTs only provided challenges and advantages for the students or for the teachers themselves as well. The two questionnaire items (1) challenges, (2) advantages were analyzed by individual code systems. See Appendix F2 and Appendix F3 for a full overview of the applied coding. The qualitative data from both the open-ended-questions is presented as direct quotes in Chapter 4.

The analysis software provided an overview of the frequency of the applied codes. The frequency offers some insight into which advantages and challenges were more prominent to the sample. The frequency rate does, however, only provide additional insight to the qualitative data presented.

3.5 Validity and Reliability

Within all fields of research, *validity* is a necessity for achieving effective research (Cohen et al, 2018). According to Cohen et al. (2018), a research item that is invalid is ultimately worthless. *Validity* refers to “the development of sound evidence to demonstrate that the intended test interpretation (of the concept or construct that the test is assumed to measure) matches the proposed purpose of the test” (Creswell, 2014, p.14). For the research to be valid, the applied instrument must provide information about what the research project sets out to investigate. For the present study, it was made a conscious decision to meet the research question’s demand for both quantitative and qualitative data within the confinement of a questionnaire. The choice to not include a different instrument to collect qualitative data could

affect the research's validity. Thus, potential effects should be mapped out in the early stages of the project.

3.5.1 Possible threats to validity

Questionnaires as a survey instrument include some disadvantages when it comes to validity. The source of information is ultimately people. Each respondent is therefore influenced by a large number of variables that it is impossible to predict with absolute certainty (Alvesson & Einola, 2020). Nonetheless, there are certain factors that a researcher can assume may threaten validity. *The Social Desirability Bias* refers to respondents' tendency to answer questionnaires in accordance with what they perceive is socially favored (Dörnyei & Taguchi, 2009). The teachers may attempt to provide the answers that they perceive as correct or desired by the researcher. A measure made to reduce this bias was to present the aim of investigating both potential and challenges. To avoid the questionnaire appearing as some answers were sought by the researcher, the questions and statements were also spread evenly across the advantages and challenges of DTs.

The present study asks the sample about their professional beliefs. Respondents' professional self-perception may drive them to give incorrect responses because they believe them to be true (Dörnyei & Taguchi, 2009). The inaccurate information is a consequence of *self-deception* (Dörnyei & Taguchi, 2009). Examples of this could be a teacher answering that they have a different level of ICT competence or competence in teaching reading strategies for digital formats than they actually have. One measure to address the risk of self-deception was to ask the respondents which tasks they felt capable of doing to reflect ICT competence. In terms of teaching reading strategies, the statement compared printed and digital formats. As a result, a respondent who strongly disagreed did not claim that they were incapable of teaching reading strategies. The respondent would rather attest to their inability to teach reading methods in both formats at the same level of quality. The item was designed to acknowledge that the respondents could still have sufficient competence to teach reading strategies in traditional printed formats without equal competence for digital formats, and vice-versa.

Respondents' tendency to overestimate or underestimate topics in accordance with their personal preference is another variable to consider. The phenomenon is known as *the Halo effect* (Dörnyei & Taguchi, 2009). The risk of such an effect was a concern in the present study. Teachers might have personal preferences for reading formats that can influence their perception of formats in the classroom. As a measure to detect if there were

any visible trends within the sample, the respondents were asked about their reading preferences, both for work and leisure reading.

Lastly, the researcher should acknowledge *the acquiescence bias* which is a two-sided bias. *Acquiescence bias* includes both the tendency of respondents to agree on questions and statements that they are uncertain of, as well as the tendency to avoid giving strongly negative responses (Dörnyei & Taguchi, 2009). To prevent such tendencies, a well-constructed questionnaire is important (Dörnyei & Taguchi, 2009). To minimize additional doubt, it was crucial to formulate precise questions and statements. The questionnaire items were carefully constructed. Afterwards, my supervisor, Sigrid Ørevik and I evaluated and revised the items together to reduce possible ambiguous or loaded phrasing or wording. The possible effects of ambiguous or unclear items may also apply to the *reliability* of the questionnaire. The subsection that follows will outline reliability, potential threats, and how these were addressed in the present research project.

3.5.2 Possible threats to reliability

The *reliability* of the research method should also be addressed throughout the study. *Reliability* relates to the applied instrument of the research method. An instrument should provide scores that are “stable and consistent” (Creswell, 2014, p. 177). The questionnaire had to be written such that respondents answered related questions consistently and consecutively. The reliability of a questionnaire may be compromised by ambiguous and unclear questions. If the respondents must interpret the ambiguous questions independently before offering their response, the question may be read in as many different ways as there are respondents. Therefore, the process of developing the questionnaire items was a highly prioritized stage of the research project.

The respondents' general state of mind may also influence their answers. If a respondent is tired or nervous it may cause them to answer the questionnaire differently. The researcher cannot control what state the respondents are in when they answer, but some steps can be taken. As the questionnaire was distributed electronically, and available at all times during the data collection procedure, the respondents could fill in the questionnaire at the time best suited for them. Another step was to keep the questionnaire short, with a clear visual layout and clear questions (Bosnjak & Galesic, 2009; Dörnyei & Taguchi, 2009). If the questionnaire seems feasible, the respondents are less likely to get fatigued from the questionnaire itself.

Taking measures to protect validity and reliability does not eliminate all compromising risks of a research project. Cohen et al. (2018) state that “threats to validity and reliability can never be erased completely; rather the effects of these threats can be attenuated by attention to validity and reliability throughout the research” (p. 245). Nevertheless, to reduce the effects of potential threats to the study’s validity and reliability, it was beneficial to be conscious of what these threats were. In addition to the research project's validity and reliability, other ethical considerations were required. The following sub-chapter will demonstrate the ethical considerations made for the present study.

3.6 Ethical Considerations

Throughout the entire research process, there are several ethical considerations that the researcher must be aware of. These should be "a primary consideration rather than an afterthought" (Creswell, 2014, p. 37). This section will discuss which ethical considerations have been made at the different stages of the research process.

3.6.1 The initial stages

To ensure that the correct measures had been made to preserve the interests of the respondents, an assessment of the research project from an independent authority/party was done. The *Norwegian Center for Research Data (NSD)* is a government-owned company that works to ensure open and easy access to research data and improve the opportunities for empirical research through a wide range of data and support services. NSD reviewed the present research design and presented their assessment. The study was approved by the NSD, and the conduction of the survey and distribution of the questionnaire were authorized (see appendix 1 for NSD approval in full).

As mentioned in subsection 3.2.3, the respondents' privacy and anonymity were essential for the conduction of the survey. One way of addressing privacy while conducting research is through anonymity (Cohen et al., 2018). Therefore, all responses were anonymous. By securing the respondents' anonymity, they might feel safer expressing their attitudes regarding the topics included in the questionnaire (Dörnyei and Taguchi, 2009). Nevertheless, maintaining the respondents' privacy requires more than anonymous responses (Cohen et al. 2018). All means of identification must be removed, including electronic tracing such as IP-address. SurveyXact offers several measures for securing the respondents' privacy. One implemented measure for the survey was encrypted data traffic, meaning that the data traffic

between respondents and the server was encrypted. This would secure non-traceability. The data collection was password protected and the entire data handling was logged.

Another measure to secure the respondents' privacy is through carefully constructed questions. The questionnaire design did not include any sensitive questions or questions whose answers may be traced back to the respondents. Regarding the open-ended questions, respondents were explicitly requested not to include direct or indirect descriptions that may identify their students, teachers, or other colleagues at their school. The request was included both in the form of consent and the introductory text in the questionnaire.

3.6.2 Conducting the survey

I distributed the questionnaire to colleagues at the upper secondary school where I work. This required me to be a more visible researcher than the chosen research design generally entails. However, it was deemed necessary to make use of personal contacts to secure a sufficient respondent rate. The distribution among my personal colleagues could influence the data. To reduce such influence, I attempted to keep a as neutral role as possible in the distribution process. Therefore, the project invitation was sent to the head of department who forwarded to the relevant staff. The aim was to avoid any respondents feeling forced to participate or to provide what they believed to be desired responses. The questionnaire was also anonymous and would not offer me any insight in which respondents had given which answers. By providing anonymity, the respondents might feel more comfortable expressing their beliefs and opinions.

3.6.3 The analysis procedure of the data

The procedure of analysis presented in subchapter 3.4, was a measure to reduce the researcher's influence on the data. However, the open-ended questionnaire items required an analysis where the researcher is more involved. Complete data transparency was supplied throughout the analysis procedure. By displaying the concrete data material during the analysis, it would be evident which material was being analyzed at all times. This would reveal if unwarranted conclusions or interpretations were made.

The coding of qualitative data was a process that required the researcher's interpretation of the responses. I aimed to provide descriptive codes for the data analysis to secure a clear representation of the data before further discussion. Some responses proved to be challenging to code as the responses appeared ambiguous. For the few cases where I concluded that the response could belong to several codes, the segment was coded with both

possible codes. The choice to do so was an effort to avoid excluding important data. As mentioned, all responses are also available without coding.

Timing of distribution could be an affecting factor on the respondent rate. The distribution process started in the first week of February. If the questionnaire had been distributed earlier, the distribution process could have been prolonged. Expansion of the time frame could have increased the opportunity to reach more respondents.

Lastly, it is important to recognize that it is challenging to achieve complete balance and neutrality of the questionnaire. Although the questionnaire was constructed with the aim of collecting data without drawing the respondents in one direction, one should always be aware of the possible shortcomings of a questionnaire during the analysis.

4.0 RESULTS AND DISCUSSION

In this chapter, I will present the results¹⁴ of the conducted survey. First, the results from the first section of the questionnaire will be presented. These constitute background information on the participants in the study. Second, the results from the second section of the questionnaire will be presented in mean and mode scores. Subsequently, these results will be further elaborated on. The closed-ended questions with the Likert scale will be presented separately from the closed-ended questions without the Likert scale. The open-ended questions that generated qualitative data will also be presented in a separate subsection to provide a clear overview of the different data. All results from the survey will be discussed consecutively after being presented. Lastly, the results will be further discussed, emphasizing the most prominent findings from the data collection. The discussion will be done in light of the presented theory.

4.1 Background Information

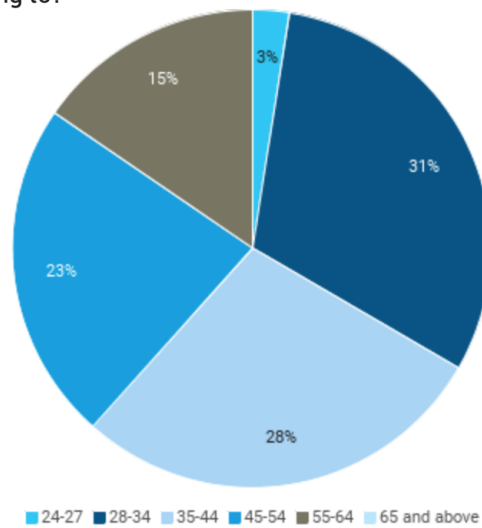
The present subchapter will present the background information from the conducted survey. Firstly, the information that was retrieved through closed-ended questions will be presented. Subsequently, the background information that was retrieved through an open-ended question about the respondents' explicit ICT training will be presented. Figure 5 below illustrates which age groups the respondents represented:

¹⁴ Due to the respondent rate of 39 participants, when presenting data in percentage, the full percentage of respondents varies from 99-101%. The software does not display percentages with decimals and presents the closest whole number. The exact numbers of respondents for each possible answer will be presented alongside the presented percentages.

Figure 5

The age group of the respondents

Which age group do you belong to?



Note. $N = 39$

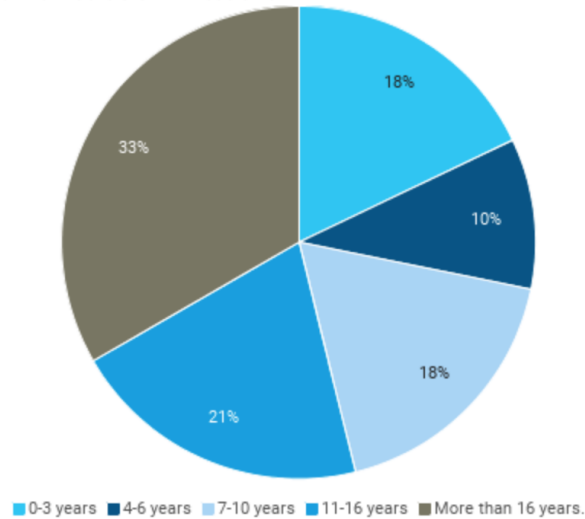
Out of the 39 respondents, all age groups were represented, with the exception of “65 and above”. The majority of the respondents were between 28-34 and 35-44. The youngest age group was limited to only one respondent. The low representation of the youngest group indicated that data did not hold sufficient evidence to present any trends based on age for this age group. The present study did not aim to reach complete representativeness within the sample, but it should be noted, nevertheless.

Teaching experience is an established influence on teacher cognition (Borg, 2008). As a result, it was of interest to provide an overview of the work experience as an L2 teacher that the respondents had (See Figure 6 below). The inquiry of work experience presented a mode of “More than 16 years” (33%/ $n = 13$), whereas the majority represented work experience of 16 years or less (67%/ $n = 26$). All identified categories for length of work experience were represented in the sample.

Figure 6

The work experience of the respondents

How many years have you worked as an L2 teacher?



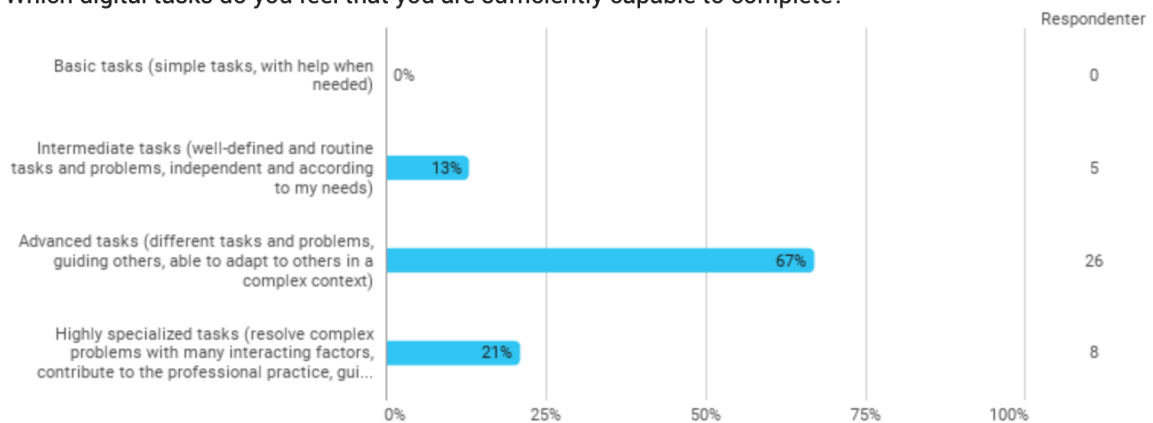
Note. $N = 39$

As all the categories for length of work experience were represented, the data would allow for insights into if there are any visible trends of how experienced the teachers are and their attitudes. Further the respondents were asked about their digital competence (see Figure 7 below).

Figure 7

The respondents reported digital competence

Which digital tasks do you feel that you are sufficiently capable to complete?

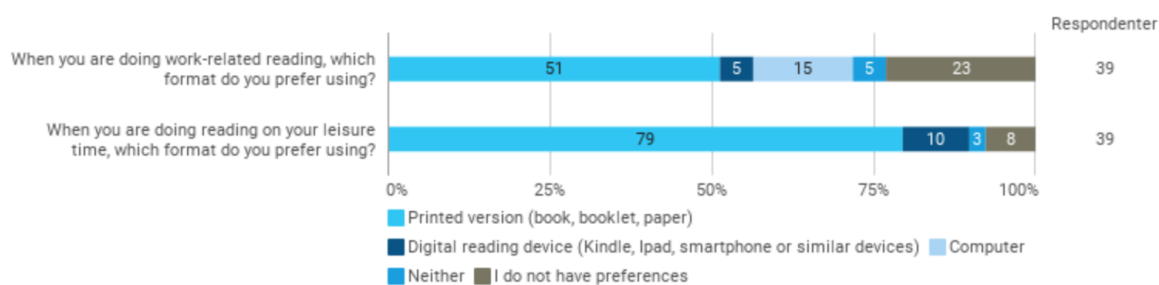


Note. $N = 39$

The respondents who participated in the survey primarily reported high levels of digital competence. There were no respondents who answered level 1: “basic tasks”. One probable explanation for this is the respondents' profession, which requires them to have a certain level of ICT competence (Røkenes & Krumsvik, 2016). The data on reported ICT competence establish that 88 % ($n = 34$) of the participants should be capable of assisting students with using DTs. Further, the teachers' personal preferences for reading formats were subjects of investigation. The two questionnaire items displayed below were aimed to establish preferences for reading formats for both work-related reading and leisurely reading (see Figure 8 below).

Figure 8

Personal preferences for reading formats - distinguishing work and leisure



Note. $N = 39$

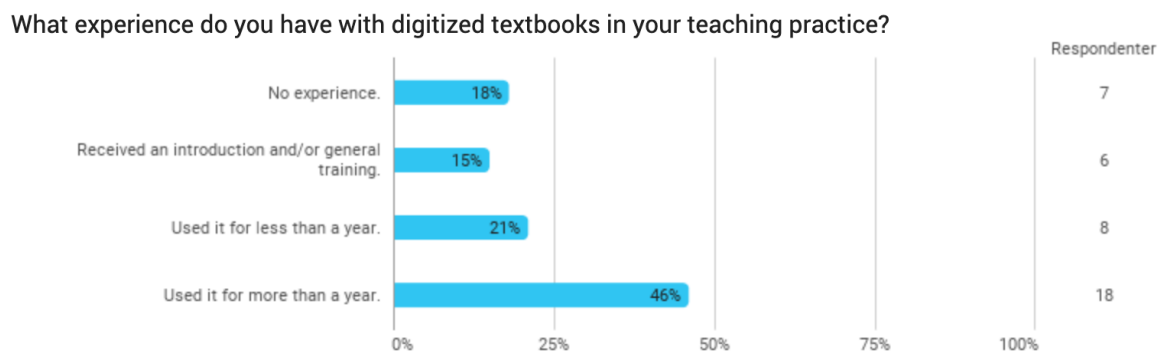
Some respondents appeared to distinguish between work-related reading and reading in their leisure time. Work-related reading received a slightly higher degree of digital devices such as “digital reading devices” and “computer” than leisure-related reading. The preference for “Computer” varied the most between work and leisure. Work-related reading also included a higher respondent rate that did not have preferences compared to leisure reading. The printed version was the most preferred reading format, regardless of reading purpose. These results could potentially reveal any prominent effects of *the Halo effect* among respondents later in the questionnaire, indicating an overestimation or underestimation of DTs based on personal preferences (Dörnyei & Taguchi, 2009). It was essential to assess if the teachers’ personal reading preferences affected their ability to recognize potential or challenges with the DTs. As the majority favored the printed reading, it was possible that this would be reflected in which reading format they favored in their teaching practice.

The respondents were not required to have experience with DTs to participate in the study. Regardless, it was valuable to map out how many of the respondents had experience with DTs. The differences regarding experience with the textbooks would demonstrate how many within the sample represented presumptions versus personal experience.

Figure 9 presented below, demonstrates that all four categories of experience with digitized textbooks were represented. This background information made it possible to detect if there were any trends amongst the respondents who had experience with digitized textbooks versus the less/not experienced. The group that had used the textbook for more than a year was highly represented, 46 % ($n = 18$). The majority of the respondents had experience with digitized textbooks beyond only having “received an introduction and/or general training”. These made up 67% ($n = 26$) of the respondents. Thus, 67 % of the respondents were likely to have beliefs based on their personal experiences. The remaining 33% ($n = 13$) of the respondent represented beliefs based on limited to no experience with the DTs.

Figure 9

Experience with digitized textbooks



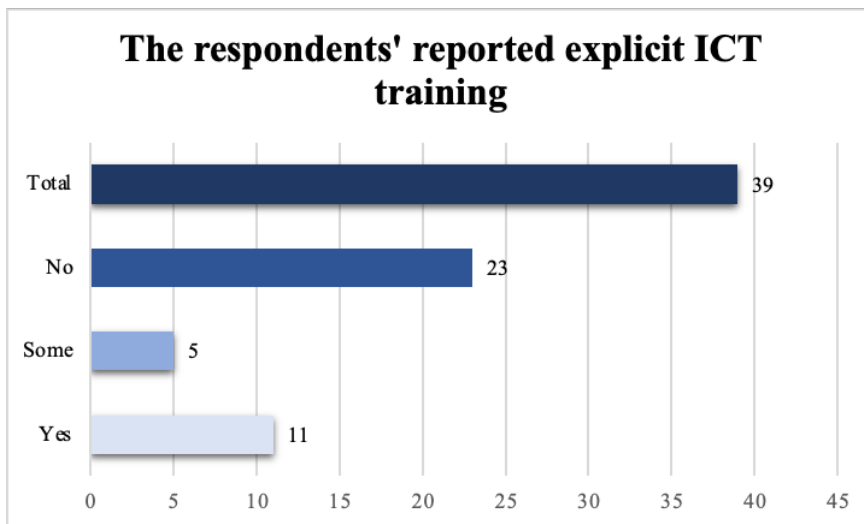
Note. N = 39

The respondents were further asked through an open-ended question if they had received any explicit training on how to make use of ICT in their teaching. The aim of the open-ended question on explicit ICT training was to provide an overview of to what extent the respondents reported that they had received such training (see subsection 3.2.6 for more details). For further discussion, it was of interest to map the number of respondents who had and had not received training. Therefore, the qualitative data were coded and established how many respondents reported having had explicit ICT training and how many reported they had

not experienced such training. The data result from this analysis is presented in Figure 10 below:

Figure 10

The respondents' reported explicit ICT training



As Figure 10 shows, 11 respondents reported having received explicit ICT training. In comparison, five respondents reported that they had received a limited quantity or quality of explicit ICT training. Consequently, 16 out of the 39 total respondents reported having received some form of explicit ICT training. The remaining 23 respondents reported that they had not received any explicit ICT training. Most of the respondents answered the questionnaire item with “yes”, “no” or “some”. As a result, the coding analysis was fairly straightforward. However, some respondents offered some additional information in their responses. One respondent (R21) reported having “30 study points” and another had “MOOCs¹⁵ on ICT inceducation and work shops at my school”, offering further insight into what explicit ICT training they had received (R19). Given their concrete examples, these responses were categorized as “yes”. In contrast, some of the respondents reported that they had not received explicit ICT training and outlined that they were self-taught:

¹⁵ MOOC refers to *Massive Open Online Courses* which are free online courses available for anyone to enroll. MOOC provides courses on various topics and at different levels. The courses usually have an enrollment fee but may offer free access to a limited selection of the course material.

“ Not really I’m mostly self taught. I’m quite competent with computers as I like to game in my spare time” (R16)

“No. Am self-taught.”.(R29)

The data retrieved from the open-ended questions established that several respondents had received some degree of explicit ICT training. Nevertheless, a slight majority of 59% ($n = 23$) reported the contrary. Compared with the self-reported ICT competence, the respondents appeared to feel competent in ICT regardless of limited or non-existent ICT training. The dissonance between ICT competence and explicit ICT training offered interesting background information to discuss in the light of the questionnaire result. The next subchapter will present the questionnaire results in detail.

4.2 Questionnaire Results

The results from the questionnaire items in section 2 will be presented in four subsections. Firstly, the mean and mode results will be presented in Table 3. Secondly, the attitudinal data from Likert scale questions will be analyzed and discussed. Thirdly, the results from the two close-ended questions about the challenges and advantages of teaching reading strategies with DTs will be presented. Finally, the qualitative data from the open-ended questions will elaborate on the preceding results.

4.2.1 Mean and mode results

Table 3 presented below, displays the mean scores of the data collection. The mean score represents the average responses to the quantitative questions in questionnaire section 2, conducted using the Likert scale. The table also shows the mode score, which is the value that appears the most frequently in the replies of the informants. These results will be the subject of discussion, offering further nuance to the data, in addition to the bar charts.

Here, 1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly agree. For questions with “yes - to some extent - uncertain – no” as possible answers, the numbering was: Yes = 1, To some extent = 2, Uncertain = 3, No = 4.

Table 3*Mean and Mode Results of Questionnaire Items - Section*

Questionnaire item number:	Statement:	Mean	Mode
10	The reading strategies that can be used for reading on screen are different from the reading strategies that can be used for reading printed texts.	3,69	4
11	The integrated functions in digitized textbooks can promote reading strategies for reading English.	3,69	4
12	Students' reading of a digitized L2 textbook includes more challenges in regard to promoting the use of reading strategies than a printed L2 textbook does.	3,41	4
13	Digitized L2 textbooks may hamper the students' focus/concentration more than it can improve reading strategies in the L2.	3,59	4
14	I experience that I have adequate experience and education to teach reading strategies on screen and on paper with the same level of quality.	3,05	2
15	Do you believe that using digitized textbooks when teaching reading strategies may include some challenges?	1,77	1
17	Do you believe that using digitized textbooks when teaching reading strategies may include some advantages?	2,08	2

Note. $N = 39$

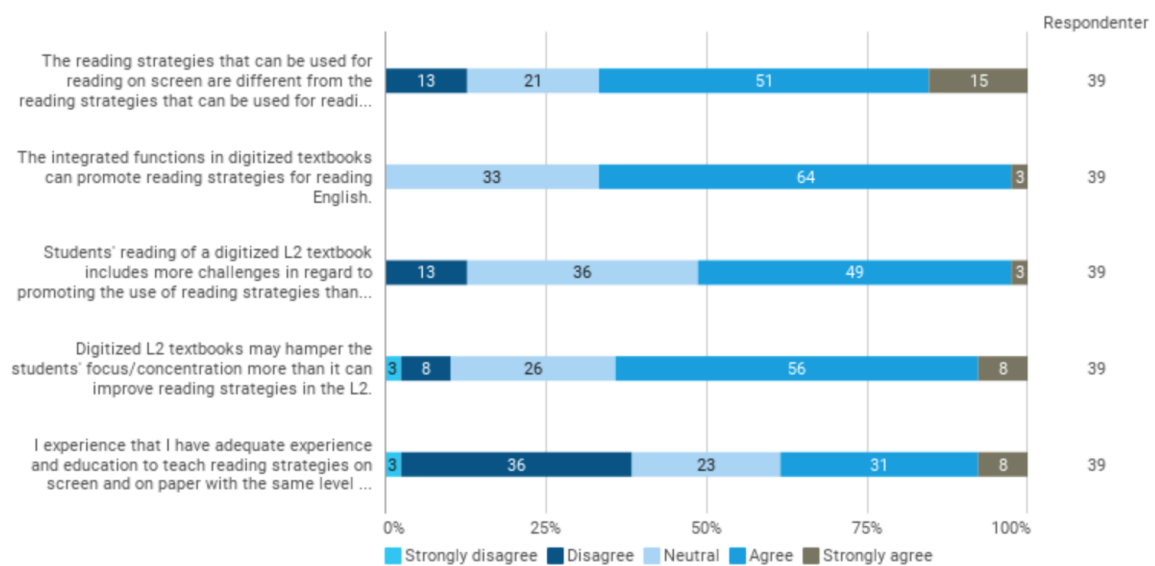
The mean and mode scores indicated that the majority of the respondents replied “agree” to items 10-13. On item 14, the majority replied “disagree”, but the mean score indicated that there were a considerable number of respondents who answered “neutral” or “agree” as well. On item 15, the majority replied “yes”, with a mean score of 1. The item received a mode score of 1,77, implying “to some extent” was also highly represented. Lastly, on item 17, the majority of the respondents replied: “to some extent”. I will present and discuss the results in detail in the following subsections in the following subsections.

4.2.2 Attitudinal data from Likert scale

The attitudinal data was expressed using a 5-point Likert scale on five statements. The findings from these five statements will now be presented chronologically in the current subsection. See Figure 11 below for the complete bar chart. To see the complete result of the questionnaire, see Appendix E.

Figure 11

The attitudinal data from Likert scale



The first statement invited the respondents' opinions on whether the reading strategies on screen are different from the reading strategies that can be used for reading on paper. The majority of the respondents reported that they agreed with this statement (66% / $n = 26$). Out of these, 13% ($n = 5$) strongly agreed. Thus, the mode score for the statement was 4 (agree), while the mean was 3,69. There were 8 of the respondents who replied neutral and 5 respondents who disagreed. None of the respondents expressed that they strongly disagreed. The degree of experienced difference between reading strategies for the formats may vary from respondent to respondent. The majority of the respondents replied "Agree", demonstrating that the teachers perceived the reading format as an influential factor in choosing reading strategies.

As presented in the theoretical framework, there are similarities and differences between reading on screen and on paper. While some scholars argue that reading comprehension and reading strategies are adaptable to formats by nature, a majority advocate the importance of recognizing the differences (Coiro, 2003; Alexander, 2012; Brun-Mercer,

2019; E-READ, 2019). The L2 learners may benefit from having guidance in distinguishing the reading strategies for the two formats and seeing a transfer value across formats. By scaffolding the students to see the relevance of what they already know in a new context (i.e., digitized reading formats), they may engage in the overall competency aim of deep learning (Brevik et al., 2019b; Brevik et al. 2020a).

Despite lacking any evidence of how the teachers explicitly draw this distinction in the classroom, the data showed that the majority were aware of a difference. Teachers who are aware of the differences between reading formats and strategies may be more likely to scaffold students' awareness in this regard. It is also important to acknowledge that the digital and printed reading formats may have both similarities and differences. As the mode score was 4 (agree), the majority of the respondents might have recognized that there are differences between the formats, but also being aware that the reading strategies are not completely different. As a result, they may have refrained from answering “strongly agree”.

To the second statement, a majority of the respondents reported that they “agree” that the integrated functions in digitized textbooks can promote reading strategies for English (64% / $n = 25$). Only one respondent replied, “strongly agree”. No respondents replied that they strongly disagreed with the statement. With a mean of 3,69 and a mode score of 4 (agree), a substantial result indicated that they agreed to a potential for promoting L2 reading strategies in DTs was connected to the integrated functions. To what extent the respondents believed the individual functions held such potential would become more evident in the open-ended questionnaire items. It is important to note that these respondents might have identified the potential of DTs in other aspects than the integrated functions as well. 33 % ($n = 13$) of the respondents were neutral to the statement. As 13 respondents reported either no experience or only received an introduction to DTs, it is likely that these respondents replied neutral to the statement. Specific functions may be harder to foresee advantages of if one does not have personal experience with them.

The third statement sets the printed and digitized textbook up against each other and highlights the use of reading strategies. The respondents were asked to consider the statement: “Students’ reading of a digitized textbook includes more challenges concerning promoting the use of reading strategies than a printed L2 textbook does”. The statement received a mean score of 3,41 and a mode score of 4 (agree). Thus, a slight majority of the respondents replied that they strongly agreed or agreed with this statement (52% / $n = 20$). These respondents believed that a digitized textbook may include more challenges than a printed version. The belief that DTs include more challenges may be a consequence of several factors. It may be

due to the added complexity of digital reading, as argued in the second chapter of this thesis (Coiro, 2003; Anderson, 2003; Brun-Mercer, 2019; E-READ, 2019). Moreover, it may be a consequence of the teachers' lack of experience or training in using DTs in the classroom, as the results from questionnaire item 5 indicated (See Figure 10 for full bar chart).

The background information indicated a generally high level of ICT competence among the respondents. According to their reports, they are generally competent with ICT, but several respondents experience not having explicit training in making good use of it in their teaching. Previous research has demonstrated a similar dissonance between experienced ICT competence and ICT use in teaching practices (Røkenes & Krumsvik, 2016; Lund, 2017). It is also worth considering that the respondents who agree with the statement might have been influenced by a combination of the digital format and limited explicit ICT training. In the remaining group of respondents, 36 % ($n = 14$) replied "neutral" and 13% ($n = 5$) replied "disagree". Thus, some teachers felt that DTs do not include more challenges than printed textbooks.

To the fourth statement, the majority of the respondents "agreed" or "strongly agreed" that the digitized L2 textbooks may hamper the students' focus/concentration more than it can improve reading strategies in the L2. These made up 64 % ($n = 25$), where 8 % ($n = 3$) of these respondents strongly agreed. Consequently, the mode score was 4 and the mean was 3,59. There were 11% ($n = 4$) who replied either "strongly disagree" or "disagree", leaving 26% ($n = 10$) of the respondents who replied "neutral". Despite the majority of the respondents identifying focus as a challenge with the DTs, the digital age requires the students to overcome these distractions. Even though the EFL teacher could choose to reduce distractions to the minimum, the students will still face a considerable number of digital distractions outside the classroom. As English is a major language in the digital world, students will likely encounter their L2 on digital platforms. To better prepare them, the classroom practices should include sufficient time and strategies to experience these digital encounters with the L2.

The last statement targeted the respondents' experience of their competence in teaching reading strategies on screen and paper. The respondents' answers indicated a variation within the sample, with a mean of 3,05 and a mode score of 2 (disagree). The respondents who replied "strongly disagreed" or "disagreed" with the statement made up 39 % ($n = 15$). The respondents who replied "neutral" made up a considerable 23 % ($n = 9$) of the sample. Further, 39 % ($n = 15$) replied either "strongly agree" or "agree. The number of teachers who felt, to some degree, confident about teaching reading strategies for both formats was the same

amount as the ones who did not. The results indicate a bigger variation within the sample than what their reported ICT competence or explicit ICT training can explain. The respondents' ability to teach reading strategies on both digital and analog formats does not appear to be limited by ICT-related challenges specifically. Although the majority recognized a difference between the reading strategies, there may still be uncertainties related to what exactly these differences are. Furthermore, there might be uncertainties about how these “different” strategies can be taught. The presented results will be further discussed in sub-chapter 4.3. First, the data from the closed-ended questions and the open-ended questions will be presented.

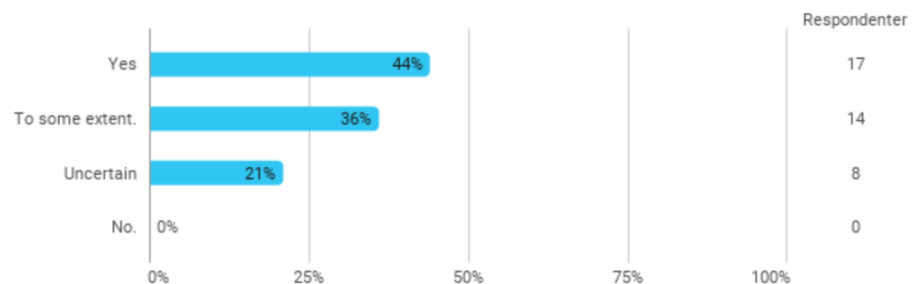
4.2.3 Attitudinal data from closed-ended questions

The respondents were asked to what extent they believe using digitized textbooks when teaching reading strategies may include some challenges. The possible answers provided were “yes-to some extent-uncertain-no”. See Figure 12 below for the complete bar chart of the data.

Figure 12

Attitudinal data from closed-ended questions: challenges

Do you believe that using digitized textbooks when teaching reading strategies may include some challenges?



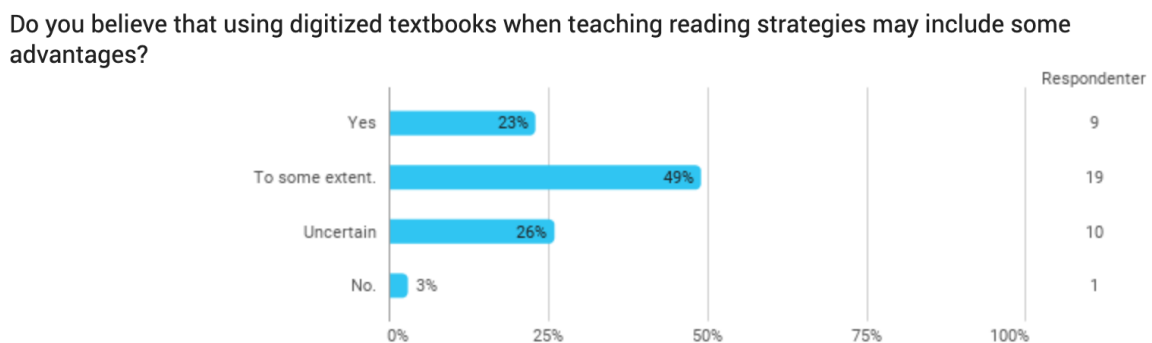
Note. $N = 39$

The majority of the respondents replied that they believed using digitized textbooks when teaching reading strategies may include some challenges (80 % / $n = 31$). The remaining respondents replied “uncertain” (21% / $n = 8$). Thus, no respondents believed the use of digitized textbooks when teaching reading strategies is without challenges. These results show that although only a slight majority expressed that DTs include more challenges when

compared to the PTs, a considerably higher number recognized that DTs might present some challenges. This result would also include several respondents who did not experience the DTs as particularly challenging compared to PTs. The respondents were asked in the same manner to what extent they believe that using digitized textbooks when teaching reading strategies may include some advantages:

Figure 13

Attitudinal data from closed-ended questions: advantages



Note. $N = 39$

A majority of the respondents reported that they either believed or believed to some extent that using digitized textbooks when teaching reading strategies may include some advantages (72% / $n = 28$). The remaining respondents reported “uncertain” (26 % / $n = 10$) and “no” (3% / $n = 1$). Compared to the previous item, there were more respondents who perceived challenges than advantages (81 % versus 72%). There was also a slightly higher rate of uncertainty regarding advantages than challenges with the DTs (26 % versus 21 %).

4.2.4 The reported challenges of digitized L2 textbooks

The following section will present and discuss the qualitative data from the open-ended questions. Firstly, the challenges that the teachers associated with the DTs will be discussed. Secondly, the advantages associated with the DTs will be elaborated on. Each section will include examples from the respondents. The discussion, however, considers some responses in part by omitting the parts that do not add to the current topic. In some cases, the remaining parts of the quotes are included under a different topic of discussion. All full responses will be available in Appendix E without coding and in Appendix G for coded responses.

The teachers were asked to elaborate on which challenges they associated with digitized L2 textbooks when teaching reading strategies. For a full coded analysis of questionnaire item 16: challenges, see Appendix G2. The challenging aspects of digitized L2 textbooks that occurred most often were: (1) practical aspects (ICT), (2) concentration, and (3) cognitive processes (see Appendix H for the full table of frequency rate for the relevant codes). Other challenges that the respondents report related to DTs and the promotion of reading strategies were: (4) students' competence - both in L2 and digital competence, (5) text form, and (6) students' preferences.

One respondent reported that they experienced that there was not sufficient research on digital textbooks: "I don't believe there has been enough research into the use of digital textbooks (...)" (R10). As this thesis presents in Chapter 1 and the following theoretical framework, there have been studies on digital textbooks and smaller-scale research on how teachers use them in their practice. However, these have primarily focused on digital textbooks in general. The research done on students has largely focused on students in higher education. As the respondent makes clear, the topic is still in demand for further research. The previous research on digital teaching resources and DTs has demonstrated that there are several perspectives and variables to consider for an adequate understanding. The following data will present some of the aspects that color the role of DTs when teaching reading strategies in the EFL classroom.

The most prominent type of challenges reported by the teachers was the practical aspects of ICT. Although several of the respondents agreed that the integrated functions of the digital textbooks could help promote reading strategies in the L2, some expressed some challenges with them as well: "(...) The functions implemented into different digital textbooks take time to learn, and are often not worth the effort" (R2). The experience of time consumption appears to outweigh the advantages for this respondent.

Another respondent appeared to question the note-taking function of the digitized textbook:

Not being able to take notes with a pencil is my main concern. Although there is an increasing number of digital solutions for writing, they are still inferior to the pencil when it comes to reliability, flexibility and ease of use.

Underlining, writing and drawing still work best with physical writing tools, and the notes never fail, lag or get deleted.

I am also aware of the increased learning benefits of using handwriting as part of the learning process. (R38)

The practical aspect of integrated note-taking software is perceived as compromising the students' learning process for this respondent. Taking notes by hand is perceived as more reliable, flexible, and user-friendly than the digital writing tools available. It is an interesting perspective that appears to indicate that both reading and writing are either digital or analog.

The emphasis on notetaking by pen may underline that reading on a screen could benefit from non-digital notetaking. As writing by hand has been found to promote learning, one could consider that the reading of digital texts does not need to be a fully digital reading process (Mangen & Velay, 2010; Balci, 2021). Taking notes by hand can be a reading strategy to work more in-depth with on-screen reading.

Other respondents underlined the technical limitations of using digitized textbooks: “Having to work out how the system works, waiting for things to load might be demotivating, app not always optimized for screen size, additional cruft/chrome” (R32). There was also a strong perceived link between the students’ focus and the availability of distractions through on-screen surroundings:

Two main challenges with digitized textbooks:

- 1) lack of concentration due to disturbance from SoMe
 - 2) formats often require too much scrolling or are imprecise as to getting directly to a certain and only to that page. I.e. Too much disturbance in on-screen surroundings.
- (R19)

Both the disturbance from social media and other distractions from staying on task are seen as too readily available. The formats are also reported to be challenging in terms of navigation which again leads to distractions and/or increased susceptibility to distraction. One respondent highlighted that the level of distraction varies between analog and digital reading: “Distractions are more easily available on the computer than in the book” (R20). This perspective is in line with the perception of DTs involving more challenges than the PTs. The practical differences between the formats were also linked to the text form when considering challenges of concentration:

The challenge of reading longer texts on screen: may be harder to focus, for example due to the fact that we are mostly used to reading shorter text chunks on screen”.

It may also be harder to focus, reading something on a screen where you also can find all sorts of other things to look at that may distract you. Reading a textbook, provided that other devices are put away, I believe makes it easier to stay focused. (R12)

The respondent outlined the length of text as an influential factor in reading on screen, indicating that the screen format is traditionally used for shorter texts. The respondent suggested that on-screen reading is often paired with shorter text, which corresponds with the text length recommended by the research on on-screen reading (E-READ, 2019). The literature suggests, however, a need for practicing reading longer texts on screen as well (E-READ, 2019). The respondent also connected the challenges of concentration to the practical aspects of digital textbooks being on a computer. Like the previous quote, this respondent also mentioned the availability of other “things” as a characteristic that the respondent experiences as more prominent on a computer than when reading a textbook. The digital noise that several respondents perceived as an impairing factor to the students' concentration is also believed to affect cognitive learning processes:

It's easier for students to "get lost" when reading. By clicking on hyperlinks they may get explanations and prompts but deep reading and deep learning may be hampered simply because there may be too many distractions. It's vital that students are trained to distinguish between the strategies that are most suitable for the purpose of their reading and that they learn to choose the right reading strategy and the right medium (print or digital). (R9)

The challenge of deep reading in digital environments has been acknowledged (E-READ, 2019; Haugestad, 2015). Regardless, it is also encouraged to give the students sufficient training in reading on screen, also for longer texts. The respondent above argued the need for students to know how to adapt their strategy-use to the reading purpose as well as the reading medium. This observation is in line with Alexander's (2012) understanding of reading strategies as adaptive by nature, always dependent on the context. Teaching reading strategies adapted for the reading purpose may be as important as recognizing the differences between DTs and PTs. Reading strategies are not necessarily something completely different

depending on the reading format, and this respondent demonstrates such beliefs in the current sample. As a result, the sample demonstrates beliefs of both differences and similarities between reading strategies for digital and printed formats.

The understanding of reading and writing as two activities that happen with the same format, either screen or paper was experienced by several respondents. One respondent indicated challenges with note-taking as a key aspect of the cognitive process of reading:

The students miss out on the connections activated in the brain by writing by hand. Excessive time spent looking at a computer screen is demanding for the eyes, and the computer is often needed for many other activities than reading and consequently using texts on paper is an important opportunity for variation (...). (R2)

The respondent also underlined the high demand for computers on tasks other than reading, leaving reading on paper as an opportunity to provide variation. Because one student's preferred language learning and reading strategies may differ from another's, it may be valuable to approach the second language in different ways.

Most of the challenges were in general terms, with no explicit link to either students or teachers. Fourteen respondents explicitly reported challenges directed toward the students. An interesting aspect to consider was if any of the challenges of DTs when teaching reading strategies were directed at the teachers themselves. Out of the sample, eight respondents reported challenges directed toward the teacher. The challenges directed towards the teacher varied. Four respondents expressed uncertainty as a consequence of their experience with DTs or “digital reading strategies”. One of these respondents reported feeling unsure of how to teach reading strategies on digital formats and what to place emphasis on:

I know to little about both the tool and its possibilities (too little training?) and about reading digitally. I therefore feel uncertain on how to teach it and feel unsure about what I need to focus on. (R8)

The respondent also questioned if their feeling of uncertainty could be linked to insufficient training. This response offered an interesting perspective on how vital sufficient training can be when school leaders and pedagogical staff decide to use digitized textbooks. The teachers might not only need training in the technological aspect of DTs, but also how to adjust their didactic approaches to skills such as reading and reading strategies. As previous

research on teacher cognition and ICT has demonstrated, teachers might feel they have sufficient ICT competence but still have challenges making good use of ICT in the classroom (Røkenes & Krumsvik, 2016; Lund, 2017). While students may benefit from instructional guidance on using conventional reading strategies in a technologically rich EFL classroom, teachers may feel the same way about explicit training in both using and teaching reading strategies in technology-rich environments.

Further, two respondents reported that they did not know enough about the cognitive differences to fully understand the possible challenges. One of these two respondents reported that they perceived a difference in information processing between screen and paper: “(...) I think there is a difference to how we take in information from screens than from physical texts and I don't know enough about those cognitive differences to really know the full range of challenges” (R4). Although referring to a collective “we” when talking about cognitive processes and the difference between reading formats, the respondent admitted how their limited knowledge affected their understanding of the challenges.

There were three respondents who reported challenges directed at the teacher that were not explicitly linked to uncertainty. The first respondent expressed the challenging task of monitoring the students' work and their focus on the given task: “(...) -Difficult to monitor what they are doing because you only see the back of the laptop.” (R31). Another respondent argued that the ICT competence of the students plays a crucial role in the successful use of DTs and suited reading strategies:

(...) In other words, if high school students lack basic ICT competence, that is, if they lack a decent starting point in terms of digital skills, working with digitalised textbooks and digital reading strategies, may result in frustration on both the teacher's and student's part, as well as possibly a poorer result in terms of the students working their way towards the curriculum's competence aims. (R35)

An insufficient ICT level among students might result in challenges for not just the students themselves but also the teachers. The respondent linked this use of DTs and insufficient ICT competence to a possible decrease in learning outcomes. It appeared here that the teacher did not perceive reading strategies as a sufficient means to overcome the challenges of reading on screen. The reading strategies and digitized L2 textbooks are perceived as linked and equally affected by lacking ICT competence. This may have been

because the respondent perceived the reading strategies for DTs as mainly related to technologically dependent strategies (e.g., the interactive functions).

Lastly, the already mentioned respondent (R10) underlined the lacking research on the topic. The respondent problematized how the lack of research may result in an inaccurate portrayal of the digitized textbooks. The digital version of textbooks has been investigated both from the student's and the teacher's perspectives. Nonetheless, research on how these books improve the teaching of reading methods is still limited. The sample made clear that they perceived several challenges with DTs when teaching reading strategies.

4.2.5 The reported advantages of digitized L2 textbooks

The teachers were further asked to elaborate on the advantages they perceived with the digitized L2 textbook. The reported advantages mainly referred to various aspects of the integrated functions of DTs. The most recurring advantages that the respondents reported were: (1) "accessibility and/or convenience", (2) "extended material", (3) audio support, and (4) interactive text tools (see Appendix G3 to see full table of frequency rate for the relevant codes).

The aspect of "accessibility and/or convenience" was the most prominent advantage among the reports. Several reported that actions and/or processes become easier with the DTs, e.g.: "It's easier for students to look up word, terms, topics, etc. (...)". Thus, the textbooks' enriching content was perceived as an advantage when teaching reading strategies. This material is in many DTs available through hyperlinks. The disrupting nature of hyperlinks was also reported as a challenge with DTs, as it may hamper the reading process. It appeared that the same extended material may be an advantage and a challenge. Another respondent referred to the accessibility of screens and its effects on students' use and engagement:

Screens are simply more accessible, which means that students and people in general are more likely to read and engage with a screen than a piece of paper. However, what this means for retention and comprehension is still an unknown area to me. (R4)

The teacher emphasized limited knowledge about the possible challenges connected to on-screen reading. Furthermore, the high accessibility of screens was argued to increase the likelihood of students reading and engaging. The increasing engagement and motivation have been attributed to reading digitized texts and textbooks (Bikowski & Casal, 2018). The respondent demonstrated a clear emphasis on becoming familiar and proficient with a tool as a

determining factor for it to be beneficial. The ability to identify with the mediating artifacts, such as a DTs, or a computer in general, is key to the tool's effectiveness (Säljö, 2006).

The convenience of digitized textbooks has also been linked to task length, students' competence, and multimodal aspects: "Often shorter tasks, pupils are used to it, easier to add visual elements" (R3). Thus, when students are given shorter tasks related to reading, the DTs may be beneficial in promoting reading strategies. The teacher also argued that the multimodal aspect of visuals is more convenient in DTs. This remark may not directly compare with a PT, as these usually offer similar or identical visuals. However, compared to reading articles online, there may be a more prominent visual aspect found in DTs. This may be an advantage for some learners when developing and using reading strategies in a digital environment. Another respondent suggested that if students had the required competence, they would be able to experience the material as more convenient:

(...) Given that students do have the competence needed to operate a computer and access digitalised textbooks on their own, being able to keep all the material needed in one place and having it available at all times will be very convenient. (R35)

The respondent specified that the students should be able to use both the computer and the DT without additional guidance for the DTs to be convenient. The appropriation of the digitized textbook as a mediating artifact and its culture-of-use affects the learning process (Säljö, 2006; Thorne, 2013). However, a culture-of-use should not be assumed to occur naturally. The process may benefit greatly from the scaffolding of a teacher or peer discussion. Therefore, it is once again a prerequisite for the DT that relies on the teacher's ability to support the students. Students must first reach a certain level of ICT proficiency before they can take advantage of the convenience and support that DTs can provide to reading processes. In an upper secondary English class, it may not be a very demanding task to secure the required ICT level. Regardless, the disputed term *digital natives* has demonstrated that the younger generation cannot be assumed to be proficient users of all the technology imposed on them (Bennett, 2008). The teacher's role is an important variable to consider when adapting a digital tool to promote learning.

Several respondents highlighted the interactive aspect of digitized L2 textbooks as advantageous. One respondent remarked that the DTs offered more opportunities for interaction: "More opportunity to interact with the text (mark, make notes, add links, etc.)" (R15). Whereas others argued that the extended material could be beneficial: "There is the

possibility of easily looking up explanations, definitions, hyperlinks that can elaborate on the theme (if these are provided)” (R12). Although the extended material was connected to challenges such as distractions, some respondents also viewed it as a possible advantage: “Easy access to dictionary and encyclopedia to enhance understanding.” (R19). The accessibility of extended material was perceived to enhance learning. The possibility of turning to dictionaries or encyclopedias can scaffold the students' reading process of the L2. Another respondent also linked the extended material to a richer media experience: “Quick access to dictionary definitions, have parts read out loud, richer media experience.” (R32). In recognition of the diverse multimodal benefits a DT might offer, this respondent believed the digital format to present some advantages.

The mode of audio files was especially remarked as an affordance of digitized L2 textbooks. One respondent reported that this was benefitting the reading process of many learners: “(...)Many profit from listening to a text while reading” (R1). The possibility to both read and hear the L2 may be a strategy that enriches the encounter with a text. Some respondents reported that the support of pre-recorded readings of the text may be especially helpful for some students: “The biggest advantage is without question the ability for students to listen to the text. This is especially helpful for students with dyslexia.” (R23). The respondent argued that the digitized textbook is learning disability-friendly because of its audio-support. Various scholars as well as the National Support System for Special Education have argued that digitized textbooks are beneficial to students of the special education segment (Jing & Chen, 2017; Pukstad & Bråtveit, 2016; StatPed, 2020). Thus, the qualitative data from the present research confirmed that teachers share this perception.

One respondent also argued a relevance for students with lower proficiency in the L2: “The audio files/readings of the text especially help those with less English knowledge or dyslexia” (R39). There were also a couple of remarks that drew a distinction between the pre-recorded readings by an authentic voice and the synthesized voice: “(...) Audio files are also very useful, but not if read by a digital voice” (R27). The learners may not have the same outcome if the audio-support does not represent authentic language.

Another important aspect to consider is that some of the DTs offer both audio-options. The student may choose a synthesized reading or pre-recorded audio file for the same text. Hence, it is crucial to discuss the differences and assist the students in making choices that can best help their learning of the L2. If a student favors the audio-support as a reading strategy, it should not be up to them alone to discover which effects the two options have on their learning. The development of strategic readers is a gradual release of responsibility (Brevik et

al, 2020a). The process of choosing and developing reading strategies should move towards the students becoming independent. However, the process is gradual, initially with support from the teacher.

The interactive tools of DTs were attributed more possibilities to interact with the text in comparison to PTs:

Yes, there are advantages as well, such as the ability to highlight paragraphs/sentences (which a paper copy does not permit you to do as students borrow it from the library for the entire school year), and learning new vocabulary. (R25)

The interactive tools allow the students to make their mark on the textbook, arguably adapting it better to their individual learning process. Perhaps for some readers, the ability to interact with the text may better enable them to be “active readers”, a characteristic of strategic readers (Duke et al., 2011). It is also worth noting that the customized interaction between the reader and the digital text may promote the learners’ culture-of-use and identification with the mediating artifact that the DT may be. Such advantages with the interactive tools are likely to require the scaffolding of a teacher or other students. Although the DTs invite the students to experience the texts individually, the sociocultural perspective suggests that a tool such as a digitized L2 textbook may better support learning when used in interaction with others.

The respondents presented other advantages as well, such as (5) navigation, (6) developing relevant digital competence, and (7) students' preferences. Several respondents acknowledged the navigation element as beneficial. One connected the navigation possibilities to the reading strategies such as skimming and getting an overview of the text: “Using them to skim texts/get a quick overview of texts and to look up specific information is undoubtedly useful. (...)” (R27). Students must have a clear picture of the text to make predictions. Predicting has been found to be a characteristic of strategic readers (Brevik et al., 2019). Another strategy that may depend on a clear overview of the text is activating previous knowledge. Particularly when students read independently, a clear overview may help them activate previous knowledge easier. Another respondent demonstrated that the integrated navigation also applied to note-taking:

I think it would be easier to keep track of your notes, if you could search for words that you wrote earlier. The classical method would typically involve having to turn back, page by page, while digital systems would allow for automated searches.

I'm not sure how much of a benefit that is, though. I also expect there might be several other benefits. (R38)

The teacher presented yet another aspect of the EFL classroom that might be more convenient due to the use of digitized L2 textbooks instead of printed versions. Note-taking may hold great potential as a reading strategy, e.g., using control strategies to assess what one has read and understood. The teacher also expressed the uncertainty of to what extent the convenience of note-taking might hold. The students' competence level was also a topic of discussion in the advantages of DTs. A few respondents argued the demand for reading digital texts and how the students may benefit from learning strategies to do so:

Seeing as the world, in general, is rapidly becoming more digital, students should learn how to encounter digital texts and should thus work with such texts and with applying suitable reading strategies to said texts.

Digitalised textbooks also open for a lot of new possibilities in terms of what reading strategies can be used, how they may be used, and accessibility to texts/information, including hyper links and pop-up notes, interactivensess. (...). (R35)

The respondent underlined that the evolving digital presence will only increase the encounters with digital texts. The DTs are argued to offer several affordances to approach reading strategies in the classroom. A different respondent shared the understanding of digital texts becoming increasingly prominent: "Most written text is digital these days. Everyone should therefore gain knowledge and experience on reading off a screen". Previous research has shown that for students to successfully implement reading strategies in their reading, they must have sufficient practice with reading texts (Brun-Mercer, 2019; Brevik et al., 2019). This prerequisite is also the case for digital formats.

The PISA report demonstrates that Norwegian students struggle to detect biased or subjective sources, and to distinguish personal opinions from facts. The report makes it is evident that online reading requires a set of skills. If students lack sufficient digital literacy, their ability to fully understand and process information online might suffer. The development

of reading strategies is not necessarily the answer to all the challenges of reading on screen. It does, however, give the students more tools to handle the vast information flow. As Brevik et al. (2019) argue, strategic readers do not necessarily use many strategies but have a satisfactory repertoire of strategies that they draw upon independently. To reach the independent use of strategy, the process starts with a close scaffolding with the teacher and moves towards the teacher retracting, and the students gradually receiving more responsibility for the reading process.

The aspect of students' preference or motivation was also connected to the advantages of the DTs. One respondent implied that the mere digital aspect of the texts had a motivating effect on some students: “Some pupils may be more motivated to read/work on a text barely due to the fact that reading is digitalized i.e. done with the help of computer” (R29). Although it may be an oversimplification of what motivates the students to read, there may be a connection between digital reading and motivation. Another teacher supported the preference for reading digital texts to some extent but portrayed a majority that prefers reading on paper:

(...) Some students simply prefer reading material online. But for the overall majority, I think they become tired of reading digitalized material and want a paper copy. I also think that being able to read material on paper is an asset and will better prepare the students for further studies at university, as there are (I imagine) more paper copies to read there. (R25)

There seemed to be a recognition of different preferences in the classrooms, but also a concern that the students' endurance may be challenged if they are to exclusively read digitally. The respondent associated the reading on paper with an appropriate way to prepare the students for higher education. However, recent research demonstrates that digital reading also gains a more prominent role in higher education (Bikowski & Casal, 2018; Qin et al., 2018; Verkijika, 2019). In higher education, syllabuses often include resources that are available both printed and digitally. In other words, the students may have to choose what will best accommodate their learning process. Thus, developing an awareness of differences between the reading formats and enough practice and reading strategies may be a strength in later education contexts. Variation may also be beneficial for the learners' motivation in the development of reading skills development. As previously mentioned, the reading process may benefit from a semi-digital approach. If students read digitally, strategies such as note-taking may offer more benefits if they are done by hand.

Although the majority of the advantages presented were aimed at students, there were several aimed at teachers. Monitoring the students' work was raised as a challenge of DTs, but one respondent indicated advantages in this aspect as well:

(...) Furthermore, digitized books with features that the teacher can use to monitor the students' work and progress are a great tool for formative assessment. The value of a digital book highly depends on how well developed it is as a tool. An underdeveloped digital book, that is merely a digital version of its printed counterpart, may not provide advantages other than perhaps the cost issue. (R21)

The respondent underlined the importance of what affordances the DTs must have before providing advantages for the students' learning. As Brevik et al. (2020b) argued, the main reason to include digital technology in the classroom should be to assist and enhance learning. Technology should not dictate the didactic choices in the EFL classroom, and underdeveloped technology may cause added challenges that take the focus away from the learning of the L2. If both the teacher and students must spend their time figuring out the technical aspects or compensating for possible shortcomings with a digital tool, its potential affordances for language learning may remain unexplored.

4.3 Further Discussion of the Results

The presented results demonstrate that the teachers believe that the digitized L2 textbook has the potential for promoting reading strategies in the 21st century. There are several aspects of the DTs believed to hold advantages. Among these, the various interactive functions are strongly represented. An interesting finding is that many of the very same “advantages” are linked to the challenges of using DTs when promoting reading strategies. The practical aspects of ICT and digital reading formats (i.e., convenience, accessibility, and integrated functions) appeared to be the most prominent challenge and advantage of the digitized L2 textbooks. Seemingly, the DTs represent a double-edged sword in promoting reading strategies. The digital format's potential is perceived to be challenging to make good use of. There may be several reasons for the teachers' two-sided experience of the DTs.

4.3.1 Comparing the reading formats

The majority of the responses indicated a perceived difference between reading strategies for digital and printed reading formats. The teachers also seemed to acknowledge a

difference in reading strategies. However, the teachers were more uncertain about teaching reading strategies in a nuanced way to accompany these differences. The results showed that when asked if they had adequate experience and education to teach reading strategies for both formats, the most common answer was “disagree”. While some teachers felt capable, there was a higher percentage of disagreeing teachers than what would be ideal for promoting strategic readers in the digital age. Despite not particularly emphasized as a challenge with DTs by the respondents, it should be noted that this may also represent a challenge when using digitized L2 textbooks.

As Anderson (2003) suggests, a good place to start is to invite learners to a conversation about what happens when we read digitally. If the students are aware of their subjective experience of the digital reading formats, they may be better prepared to adjust their strategy use accordingly. The goal of teaching reading strategies is that the students will become able to choose independently which strategies to use (Brevik et al., 2019). Reading digitized L2 texts may involve many of the similar reading strategies they use for reading printed texts (Alexander, 2016). Regardless, there may also be a need to offer instructions and modeling on how they can adapt these reading strategies to the digital format. The students may also benefit from modeling on reading strategies that are suited for the complex reading context that digital reading represents (Anderson, 2003; Auer, 2016; Brun-Mercer, 2019; Coiro, 2003).

4.3.2 Possible threats to the promotion of reading strategies

The results of the present research project showed that there may not be a direct relationship between the ICT competence of the teachers and the teachers' readiness for digitized textbooks. The teachers did perceive that the digitized L2 textbooks held potential for promoting reading strategies. Regardless, they associated numerous challenges with them as well. The respondents' age did not show any visible trends, as challenges and advantages with DTs were reported across the age groups. There was no apparent link between the respondents' personal preferences for reading format and their attitudes either (For more details, see subchapter 4.1; subsection 4.2.2; subsection 4.2.3). What did seem to influence how teachers perceive the DTs was their experience of using digitized textbooks in their teaching (Subchapter 4.1). It did not necessarily show a clear inclination of negative or positive attitudes but a stronger ability to foresee more concrete challenges and advantages. This link is to be expected, as respondents with little or no experience may tend to give more abstract or general reports (Dörnyei & Taguchi, 2009).

One challenge that was a concern of many of the respondents was the DTs' effects on the students' concentration. The majority of the teachers believed that the DTs hamper the students' focus more than improve the students' reading strategies in the L2. Although these respondents might have seen advantages with the digitized textbooks, the challenge of keeping the students' focus outweighed the pros. However, one respondent pointed out that the students' concentration is susceptible to distractions in general: "But regardless, students are easily distracted by other situations or personal digital devices, so I don't find the reading on screen as a particular issue" (R23). This respondent raises an important perspective on ICT entering the classroom. As the theory of digital natives implied, a higher presence of technology would create a generation that multitasks more and has a shorter attention span. However, research has shown that there is not enough evidence to support these claims (Bennett, 2008; Lodge & Harrison, 2019). The research appears to be inconclusive on the degree to which technology impacts our concentration (Lodge & Harrison, 2019).

Attention is an important factor in the learning process, but what influences it is a complex topic. A big challenge to humans' ability to concentrate is ourselves. The mind has a natural tendency to distract itself and drift between thoughts (Killingsworth & Gilbert, 2010). It might not be the DTs that are the main challenge to concentration in the EFL classroom. Nevertheless, one should consider that the availability of non-curricular material that enables the students to support their learning may also enable them to distract themselves.

The scaffolding that a teacher provides for students in developing their reading strategies should include strategies for coping with distractions. Digital devices offer the students a "whole world" outside the classroom. The affordances of technology may bring the students closer to the real world and assist their learning. However, students distracted by digital devices may miss out on important learning taking place in the physical classroom through social interaction. The scaffolding process between students or between the teacher and student(s) becomes more challenging to achieve if the students are not present to take part in the interaction (Wood et al, 1978). A slight majority of the respondents perceived the DTs generally included more challenges than PTs when promoting reading strategies. The data suggest that digitally distracted students in the classroom is one of the reasons for teachers to perceive DTs include more challenges than PTs when promoting reading strategies.

4.3.3 Prerequisites for promoting reading strategies through digitized textbooks

By having a clear picture of both advantages and challenges, it may become easier for teachers to successfully make use of DTs in their EFL classroom. When schools decide to

include or transition into digitized textbooks, it may be useful to prioritize experience exchange between colleagues. Through such an exchange, it is possible to better adapt to the "new" challenges a DT may hold and strengthen the teachers' development of professional digital competence. Some schools employ digitized textbooks in certain subjects before others, which may lead to some colleagues having significant knowledge for others to learn from. However, as this thesis has discussed, it is crucial to recognize the didactic differences between subjects. Therefore, the inclusion of DTs should also be discussed among teachers who teach the same subject.

According to the data, teachers are aware of the practical benefits of DTs but are unsure of their positive and negative effects on students' learning. As established in subchapter 2.1, DTs represent the mediating role of language. A learner's language develops in interaction with others, both with teachers and peers (Säljö, 2006). However, it is important to recognize that although essential in all subjects, the aim of developing various aspects of a language is more prominent in language courses such as English. Tools such as audio-support or extended material represent a different advantage when studying, e.g., history, as opposed to studying the L1, or a L2. When facilitating something as specific as reading comprehension and reading strategies in an L2, which format the students read matters. As the research has demonstrated, whether you read on paper, on screen or online, the reading strategies should be adapted accordingly (Anderson, 2003; Coiro; 2003; Auer, 2016; Brun-Mercer, 2019).

The on-screen reading may be more challenging with longer texts and when facilitating more cognitively demanding processes such as deep reading. However, the findings from the present study suggested that this is not reason enough to exclude on-screen reading but to be aware of the added challenges and value of variation. Previous research has demonstrated that the digitized reading format is increasingly used in higher education as well (Bikowski & Casal, 2018; Qin et al., 2018; Verkijika, 2019). Higher education is often characterized by its higher cognitive load on the students. Hence, it is crucial that the upper secondary level prepares learners to engage with educational resources beyond short readings and only scratching the surface of its content. This is a process where scaffolding by the teacher may be essential. The students are also likely to choose their reading format themselves in later education, emphasizing the importance of students being aware of the differences and similarities with the reading formats.

Another finding of the research project was the high rate of respondents who reported not having received any explicit ICT-related training. The majority of the respondents had not any recollection of explicit training, and several of the ones who reported they had, underlined

that it was quite limited. Perhaps this can be where the gap between teachers' reported ICT competence and experienced ability to use ICT in their teaching occurs. If teachers are not sufficiently educated on reading and reading strategies, it becomes challenging to scaffold their students in becoming strategic readers. This may be true for using DTs to promote particular curricular aims as well.

Many respondents made it clear that they were reluctant to say they could teach reading strategies at the same level of quality on screen as on paper. This was the statement that made most participants reply "neutral". Being unwilling to agree or disagree might indicate that one is aware of the complexity of the matter at hand. The respondents may feel unsure about what is required to teach reading strategies in both formats with the same level of quality. While they may understand that the different formats affect different reading strategies to some extent, they may not be fully aware of to what extent. It may be important for teacher educators and school administrators to provide a structure and guidance for the teachers to connect the current digital toolbox to good pedagogic-didactic judgment. If teachers are to promote students' reading comprehension in a digital age, the teachers themselves benefit from receiving modeling and guidance on how to adapt the teaching of reading strategies to the screens.

Today, digital texts are available in every classroom for students to interact with, regardless of whether they use DTs. Therefore, it is problematic that many respondents report that they do not know enough about reading on-screen or about reading strategies for digital texts. The sample generally reports good ICT competence, which enables them to scaffold the students in using the DTs. Regardless, it appears to be a bit ambiguous to the respondents how to scaffold the students' reading processes through DTs. The reading strategies for reading on screen are not opposite from the strategies for reading on paper. According to the presented theory, there are, however, some differences (Brun-Mercer, 2019; Coiro, 2003; E-READ, 2019).

Affordances of digital tools may also exist without being realized (Gibson, 1979). Advantageous functions may also be known to the teachers without the teachers being able to make use of them in the classroom. It should be noted that one respondent replied "none", when asked about the potential advantages of DTs. In contrast to the majority of the respondents who named one or more advantages, it is evident that regardless of which affordances the DTs may hold it bears no guarantee that the teachers perceive them that way.

One respondent suggests that perhaps the lack of training could be a reason for their uncertainty about the advantages and challenges and/or not having enough knowledge about

reading strategies for digital formats. Reading strategies for digital formats is an aspect of reading strategies that teachers may not have had training in during their education. The on-screen reading was perhaps not as widespread in the classroom context as today. Previously, the digital text represented a supplement to the printed “main” text, the textbook. With a digitized textbook, there is a possibility of a role switch. More teachers may also opt for a textbook-free subject, where they themselves select relevant material such as articles, literature, movies, and games. The changing use of learning material may require teachers to reassess the language learning strategies they teach their students.

Teacher cognition is influenced by various aspects, and education and training are some of the factors that may impact how useful digital technology might be perceived. All in all, the data of this study presented teachers who generally see both potential and challenges. There is no guarantee that explicit training on how to make use of ICT in their teaching practice will make the teachers exclusively more positive toward DTs. One respondent stated in line with Brevik et al. (2019), a skepticism toward including digital devices in the classroom without good enough reasons:

I am generally of the opinion that all digital devices and programs are tools that should be used out of need. There is no need to use a tool just because it exists, and updates and new versions of digital tools are not necessarily better than other tools for the job. (R2)

The inclusion of digital tools should not be assumed to be better simply for being the “latest version”. There should be a need for them to promote the students' learning. However, there were other respondents who pointed to a specific need: training in reading digital texts. Research suggests that the challenges of reading on screen may benefit from strategies and sufficient practice (Anderson, 2003). The DTs may offer such an arena. It is crucial to define the reading purpose and the desired learning outcome when deciding on digital formats (Brun-Mercer, 2019). The digitized format may not always be the best suited reading format, but the determining factor is for what purpose are the students reading. If the goal is deep reading, one should consider the added challenges to achieving this goal through on-screen reading. As previously mentioned, an awareness of both advantages and challenges of the reading formats may better prepare teachers and students for developing reading strategies.

Ideally, the teacher and students would always have the choice of reading the textbook on screen or on paper. This is unfortunately not always the case. In schools where the budget and other practical concerns have led to choosing digital textbooks exclusively, it

is important to be conscious of when a printed copy of a short story or article is more suited for the reading purpose. A common practice among publishers is to allow a small percentage of the textbook to be paper copied. Hence, the teachers should in these cases make insightful choices of when and which texts that promote the learners reading comprehension on paper, and which may hold potential for practicing perseverance and reading strategies on digital reading formats.

5.0 CONCLUSION AND FURTHER RESEARCH

The way students interact with English changes as a result of digital texts. The digitized textbooks have entered the Norwegian classroom facing different reactions. The DTs represent financial and practical advantages in comparison with their printed counterparts. The digital material offers continuously renewed material, at a competitive price range. Despite their convenience, there have been several concerns voiced by teachers, students, and parents (Brochmann, 2020; Ditlefsen & Hamre, 2020; Brekke, 2021; Nilsen, 2021; Krogh, 2022; Rørvik, 2022). These concerns include, among others, claims of the DTs including severe distractions and negative effects on learning. Although important concerns, the general notion of DTs appears to lack didactic considerations.

The digitized textbooks have been investigated previously, but the emphasis on specific aims of language learning in a Norwegian context was still unattended (Pukstad & Bråtveit, 2016; Jing & Chen, 2017; Ødegård, 2017; Biltvedt & Bergheim, 2018; Qin et al., 2018; Lindqvist, 2019; Verkijika, 2019). As the topic of DTs has continued to awaken strong opinions in Norwegian schools, it carved a relevant scope of investigation for my research project. I aimed to investigate what teachers believed about the digitized textbooks from the perspective of English. More specifically, with the aim of promoting strategic readers in the digital age. The present thesis set out to investigate the following research questions:

RQ1:

What are the teachers' reported beliefs on the digitized L2 textbook's potential for promoting reading strategies in the 21st century EFL Classroom?

Sub research questions:

1. To what extent do teachers believe that the digitized L2 textbook has the potential for promoting reading strategies?
2. To what extent do teachers experience that they have adequate experience to teach reading strategies, on screen and on paper, with the same level of quality?
3. What are some advantages and challenges that teachers associate with the digitized L2 textbook when promoting reading strategies?

In the concluding thoughts of this thesis, I will comment on each of the presented questions. Firstly, I will summarize how the research questions were approached, and subsequently what the main findings of this approach were.

5.1 Conclusions

Through a questionnaire, teachers' reported beliefs about digitized L2 textbooks have been investigated. The digitized L2 textbook has been discussed from a socio-cultural perspective, arguing the teachers' central role in the students' learning process. As the present curriculum promotes the competency aim of learning to learn, language learning strategies and reading strategies define the scope of this thesis. The theoretical perspective provides a rationale for exploring digitized textbooks as a mediating artifact for developing and identifying with the target language. In the light of the presented theory, the present research project targeted Norwegian upper secondary teachers of English, by asking about how they perceived the role of DTs when promoting the students' reading strategies in the L2. In contrast to the seemingly polarized debate on digitized textbooks, the results suggest that teachers' perception of the digital format is in fact rather complex (Brekke, 2021; Brochmann, 2020; Ditlefsen & Hamre, 2020; Krogh, 2022; Nilsen, 2021; Rørvik, 2022). The following paragraphs will present the findings of the research project.

Teachers do perceive potential with the digitized L2 textbooks in English. When promoting reading strategies, integrated functions such as audio-support, extended material, in-text navigation tools, note-taking, and highlighting, are considered useful or potentially useful. Some teachers also underlined the increasing availability of digital texts as a rationale for students reading on screens.

Although the teachers recognized a potential with digitized L2 textbooks, they perceived various challenges with them as well. The most recurring challenges were related to the practical aspects of digitized textbooks and ICT in general. The availability of potential disturbance or “digital noise” is a concern of several respondents. The DTs are believed to hamper concentration more than they promote reading strategies in the L2. This finding may be closely related to the respondents perceiving the DTs as more challenging than PTs when promoting reading strategies.

The effects of digitized textbooks and on-screen reading are a concern for several respondents. The concern is linked to lacking knowledge about the effects of the medium, and perceived exclusion tools the respondents believe are already promoting learning. Printed

textbooks represent an important medium to facilitate the learner's reading competence in the L2. It appears to be a concern for abandoning what we know “works” for something unknown without sufficient proof that the alternative is either better or equally as good.

The teachers are divided when it comes to feeling that they have adequate experience/education to teach reading strategies at the same level of quality, for both paper and screen. The experience of insufficient experience and education may relate to the low reported explicit ICT training. Several respondents had received no or little explicit training in how to make use of ICT in their teaching practices. Previous research suggests that teachers are successful in teaching students about reading strategies, but find the “when, where and why” of particular strategies more demanding (Brevik et al., 2020, p. 155). The findings of the present research question suggest that this is true for on-screen reading as well.

The teachers perceive a difference between the reading strategies for reading on screen and on paper. Although acknowledging the differences, the respondents communicate a gap between what they know about on-screen reading and their ability to support their students in developing the necessary competencies. The results suggest that there is still a gap to bridge between the theoretical knowledge and the ability to implement the theory in their teaching practice.

The practical aspects, as well as the effects on cognitive processes, appear to be a double-edged sword. The very same things that make the digitized L2 textbook advantageous also entail challenges. The results indicate that the lack of training may cause respondents to perceive more challenges than advantages with the DTs. This is not to say that the DTs are in fact more advantageous than challenging. However, the affordances of any object or tool may be undiscovered or only partially discovered (Gibson, 1979). As DTs represent a relatively new L2 textbook format, there is a high likeliness that there are benefits yet to be discovered. The same might be true for challenges, but limited training and/or experience may color the respondents' perception of the DTs' challenges. Challenges can be perceived as more dominant if the digital material is still fairly new to the users, both teachers and students.

The results do not offer any dominant pro- or counter-arguments for DTs' potential when promoting reading strategies. It is clear that the teachers see both sides, supporting the findings of Bildtvedt & Bergheim (2018). In the nuanced picture of digitized L2 textbooks, there are some didactic implications that become clear. The following subsection will summarize which didactic implications the present study suggests.

5.1.1 Didactic implications

The investigation of the present research question demonstrates that teachers know that reading on screen and on paper may be different but how to teach reading strategies for both formats is more challenging. The previous research suggests that students need reading skills that apply to both formats (Anderson, 2003; Auer, 2016; Brun-Mercer, 2019; Coiro; 2003; Strømsø & Bråten, 2008). In this respect, reading strategies may play a big role. Metacognitive strategies have been argued as especially important when reading on screen and online (Anderson, 2003). Such strategies may include working towards awareness among students of how the reading strategies can be different on digital formats. It is useful that the students know and reflect upon how the reading format may influence the way they read. Discussing the challenges and advantages of how we read may allow students to make more conscious choices in the future when they are given the choice between reading digitally and on paper.

There have been several studies on reading formats and students' preferences in higher education (Bikowski & Casal, 2018; Verkijika, 2019; Qin et al., 2018). These studies indicate that there is a relevant discussion to be had on how the students use both formats. As upper secondary is to prepare students for higher education, they should be prepared to make this choice as well. Digital texts cannot be excluded (Strømsø & Bråten, 2008). There is a need for reading strategies when encountering L2 text also digitally.

The theory suggests that the students may benefit from explicit modeling of using reading strategies with DTs (Brevik, 2019a; Wood et al., 1976). There are however respondents who outline the students' digital competence as a requirement for the digitized material to have the potential for promoting RS. The socio-cultural perspective also argues the importance of learners identifying with the mediating artifacts such as a digitized L2 textbook may be. Hence, the teacher may assist the learners through modeling in using the textbook in general. These suggestions place the teacher in an important role as facilitator, scaffolding partner, and instructor. Moreover, the development of the teachers' competence is also essential in the discussion of digitized L2 textbooks.

5.1.2 Implications for developing professional ICT competence

Within the given sample, the ICT competence is reported to be at a high level. However, the teacher's personal ICT competence is related to but not exclusively the same as professional digital competence. One aspect that separates PfDC from an individual's personal

ICT competence, is the ability to make use of ICT in the classroom (The Norwegian Directorate for Education and Training, 2017). The use of ICT goes beyond the practical aspects and is understood in relationship with its effects on learning and the pedagogical and didactic potential and challenges of the various technologies.

The teachers report having little explicit training in how to bridge their knowledge about ICT to their teaching practice in the EFL classroom. The present thesis argues that the development of teachers' competence may benefit from structural and educational support from the school leaders. Courses provided by external and internal contributors could be beneficial to teachers as they would allow them to build on what they already know about ICT. The courses should have a practical approach, demonstrating examples of how to include what they know about ICT in their teaching.

Another measurement to support teachers in developing their professional ICT competence is time. Research has shown that it is not necessarily the lack of motivation or desire to improve personal competence that hampers teachers, but the lack of time (Lindqvist, 2019). The role of a teacher includes various demanding and time-consuming tasks. When simply everything “mandatory” in the work description demands time, teachers may feel that they do not have time to work on developing their own competence. Therefore, school leaders should consider the importance of using allocated meeting time for such professional development. The allocated time should also invite the teachers to a dialogue with their superiors about what they need to secure them feeling equipped to handle the changing classroom context. It is important to recognize that each school and each individual teacher will have different needs regarding professional development.

As professional ICT competence takes time to develop, it should be considered that the development should start as early as possible. ICT is a key part of the Core curriculum and should therefore have a priority in teacher education programs (The Norwegian Directorate for Education and Training, 2019b). Digital technology cannot be fully explored as a separate book chapter or module in a course. As ICT has gained an integral role in society and is available across all the different basic skills, it should be discussed in the light of the other basic skills and competence aims. When developing reading skills, teacher students should engage in discussions about what role can ICT play for that purpose. Which advantages and challenges does this present? Does this also apply to developing oral skills or writing skills?

The process of deep learning involves seeing how what you already know may be applied to other situations, both known and unknown (The Norwegian Ministry of Education and Research, 2018). Through exploring the way we use ICT, in every area of teaching and

learning, teacher students may gain a deeper understanding of ICT's potential. This suggestion is not to glorify ICT as only beneficial, but by striving for awareness of all the various aspects ICT may have a role in, we can better understand its limitations as well. In this regard, teacher educators have a significant role to play. They can influence future teachers' competence and scaffold future teachers to better understand the possibilities and limitations of the EFL classroom in the digital age. Furthermore, they should assist the teacher students in developing strategies for dealing with the changing technology within the framework of English didactics.

To conclude, the present research project has demonstrated that the teachers believe that digitized L2 textbooks do hold potential for promoting reading strategies in the 21st century EFL classroom. On the other hand, they also believe the same material includes challenges. The most recurring challenges of DTs are related to practical aspects of ICT such as accessibility of distractions. Interestingly, the most recurring advantages were also related to practical aspects of ICT such as accessibility and convenience.

The digitized L2 textbook is believed to be a double-edged sword, both potentially promoting and hampering the students' development of reading strategies. For some respondents, the challenges outweigh the advantages. Regardless of their opinion of DTs' potential, several respondents report either a lack of adequate education and experience or having a neutral attitude toward their capacity to teach reading strategies for both paper and on-screen reading. The findings indicate that the lack of explicit training in how to make use of ICT in their teaching may be an influential factor in teachers' abilities to promote strategic readers in a digital age.

5.2 Further Research

During the conduction and analysis of the present research question, it has become evident that the digitized textbook is a complex topic. The findings show that digital tools cannot be fully investigated without taking into account the implications of the subject they are used in. It has also become clear that the DTs may be open to various perspectives of research that the present thesis does not cover.

A possible approach to the present research question was to include a qualitative method such as interviews. Together with the questionnaire interviews would form a mixed-method approach to gain further insights. However, the aim of the present thesis was to offer a broad data set, beyond the small sample size interviews generally involves. The time frame of

the project would make it challenging to get a sufficient sample size through interviews. Therefore, the choice was made to situate the research project in conversation with previous research on DTs that used interviews as a method. These studies did, however, not treat the same topic of language learning strategies and reading. Thus, future studies could offer further insight into the perceived potential of DTs through interviews.

The background information of the questionnaire revealed that the sample representation of the youngest age group was limited to one person. Hence, the present study does not provide a nuanced portrayal of the younger generations' attitudes towards DTs. How the younger teachers or teacher students perceive the DTs, may therefore be an interesting perspective to investigate in the future. To what extent the younger generation of teachers feel capable of promoting the students' development in English with digitized textbooks may also offer an interesting nuance to this perspective.

Although related, teachers' attitudes do not equal their actions in all respects (Borg, 2015). It is always a risk of people acting contradictory to their attitudes. Therefore, an interesting scope of investigation would be how Norwegian L2 teachers teach reading strategies for different mediums. It would be valuable to see what role reading strategies for online reading or on-screen reading gain in the continuously digitized EFL classroom.

The topic of digitized textbooks should also be further researched from the perspective of the students. There should be a focus on the Norwegian students' attitudes and experiences regarding reading on screen, and towards using digitized textbooks in the L2. Especially regarding how they perceive the integrated functions and support from teachers. A study on the students' development of L2 reading comprehension distinguishing between exclusively using DTs versus PTs could offer another interesting point of comparison on this matter. Just as with the teachers, it is valuable to look at both their attitudes and their actions. To fully understand how the students identify with DTs as mediating artifacts, their culture-of-use should be observed and analyzed.

The present thesis suggests that the use of ICT such as DTs should be explored from the perspective of various curricular aims. Thus, it is interesting to investigate if the digitized textbook represents a challenging or promoting influence on communicative language teaching. The digitized reading format may both enable or limit the core element of communication in the EFL classroom (The Norwegian Directorate for Education and Training, 2019b). Lastly, scholarly attention should be paid to school administrators' efforts to engage their pedagogic staff in didactical research and professional development related to choosing textbooks and other learning material for their students.

The digitized textbooks present various possibilities for further research, and from an English didactic perspective, the digitized material should be investigated with a clear emphasis on its purpose in the 21st-century classroom.

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APPENDICES

Appendix A: NSD Approval

12.03.2022, 17:29

Meldeskjema for behandling av personopplysninger

NSD NORSK SENTER FOR FORSKNINGSDATA

Vurdering

Referansenummer

721486

Prosjektittel

The Digitized L2 Textbook; its's Potential and Challenges in Promoting a Strategic Reader in a Digital Age

Behandlingsansvarlig institusjon

Universitetet i Bergen / Det humanistiske fakultet / Institutt for arkeologi, historie, kultur- og religionsvitenskap

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Sigrød Ørevik, Sigrød.Ørevik@uib.no, tlf: 92216934

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

Kaja Sandanger, Kaja.Sandanger@student.uib.no, tlf: 95001046

Prosjektperiode

01.02.2022 - 15.05.2022

Vurdering (1)

18.01.2022 - Vurdert

Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet med vedlegg den 18.01.2022. Behandlingen kan starte.

TYPE OPPLYSNINGER OG VARIGHET

Prosjektet vil behandle alminnelige kategorier av personopplysninger frem til 15.05.2022.

LOVLIG GRUNNLAG

Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som kan dokumenteres, og som den registrerte kan trekke tilbake. Lovlig grunnlag for behandlingen vil dermed være den registrertes samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a.

PERSONVERNPRINSIPPER

Personvernjenester vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen om:

<https://meldeskjema.nsd.no/vurdering/619a568b-812b-419b-b492-b55cc306d7eb>

1/2

12.03.2022, 17:29

Meldeskjema for behandling av personopplysninger

- lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke viderebehandles til nye uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER

Personvernjenester vurderer at informasjonen om behandlingen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18) og dataportabilitet (art. 20).

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

FØLG DIN INSTITUSJONS RETNINGSLINJER

Personvernjenester legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

Dersom du benytter en databehandler i prosjektet må behandlingen oppfylle kravene til bruk av databehandler, jf. art 28 og 29.

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og/eller rådføre dere med behandlingsansvarlig institusjon.

MELD VESENTLIGE ENDRINGER

Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til oss ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke type endringer det er nødvendig å melde: <https://www.nsd.no/personvernjenester/fylle-ut-meldeskjema-for-personopplysninger/melde-endringer-i-meldeskjema> Du må vente på svar fra oss før endringen gjennomføres.

OPPFØLGING AV PROSJEKTET

Personvernjenester vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Lykke til med prosjektet!

<https://meldeskjema.nsd.no/vurdering/619a568b-812b-419b-b492-b55cc306d7eb>

2/2

Appendix B: Contextual Survey Variables

	Survey	Effects on questions
Purpose	To identify upper secondary teachers' reported beliefs about digitized L2 textbooks' potential and challenges for promoting the students' reading strategies	<p>Questions are about digitized L2 textbooks</p> <p>Questions are about reading strategies</p>
Respondents	Teachers of English at upper secondary schools in Norway	Questions posed are for teachers of English in the Norwegian upper secondary context only.
Surveyor	Self-administered, electronically distributed questionnaire contains the questions	Questions must be clear and easily understood without additional assistance.
Responses	<ol style="list-style-type: none"> 1) Some questions are closed-ended using multiple-choice response alternatives. 2) Some questions are closed-ended using a ranking scale to express degree of agreement/disagreement. 3) Some questions are open-ended questions where the respondents can express themselves freely. 	<ol style="list-style-type: none"> 1) Questions can be translated on a vector gram. 2) Questions can be translated on a Likert scale. 3) Questions will be answered in the respondents' own words.

<p>Timing</p>	<p>The questionnaire takes 10-12 minutes to complete.</p>	<p>Respondents may not answer all the questions (Partial completion)</p> <p>Respondents may be more likely to start and complete if the questions can be answered quickly.</p> <p>The questionnaire must be distributed with a sufficient time frame to gather enough responses.</p> <p>Time must be set off to read and interpret open-ended questions.</p>
<p>Resources</p>	<p>The questionnaire must be made electronically with an instrument that complies with university's guidelines.</p> <p>The questionnaire must be emailed.</p>	<p>Sufficient expertise in the used questionnaire tool is required.</p>
<p>Privacy</p>	<p>All responses will be anonymous</p>	<p>Can increase the likeliness of respondents feeling safe to express their attitudes regarding the topics included questions/statements.</p>

Appendix C: Project Invitation



Vil du delta i forskningsprosjektet “The Digitized L2 Textbook; its Potential and Challenges of Promoting a Strategic Reader in a Digital Age”?

Kjære engelsklærer,

Mitt navn er Kaja Sandanger, og jeg er lektorstudent ved Universitetet i Bergen. For øyeblikket er jeg i gang med å skrive masteroppgave i engelsk fagdidaktikk.

Dette er et spørsmål til deg om å delta i et masterprosjekt hvor formålet er å undersøke hvilke tanker og erfaringer engelsklærere har knyttet til **bruk av digitale lærebøker og utvikling lesestrategier i engelsk**. I dette skrevet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg. Takk på forhånd for ditt bidrag!

Lenke til spørreundersøkelsen:

<https://svar.uib.no/LinkCollector?key=WLX3PMLELK95>

Masterprosjektet mitt er en kvantitativ studie med formål om å undersøke læreres holdninger til digitaliserte engelsklæreboken i den norske skolen. Ved bruk av en spørreundersøkelse skal prosjektet innhente informasjon som kan gi indikasjoner på hvordan lærere opplever den digitaliserte engelsklærebokens potensial for å fremme lesestrategier i det 21. århundres engelsk klasserom. I spørreundersøkelsen vil du i hovedsak bli bedt om å ta stilling til ulike påstander knyttet til digitale lærebøker og lesestrategier. Noen spørsmål inkluderer åpne svar hvor du kan svare fritt på det som spørres. Spørsmålene er skrevet på engelsk.

Hvem er ansvarlig for forskningsprosjektet?

Universitetet i Bergen er ansvarlig for prosjektet, men personopplysninger vil kun bli behandlet av meg og min veileder.

Hvorfor får du spørsmål om å delta?

For å kunne belyse problemstillingen på en grundig måte ønsker jeg å samle inn data fra en bred representasjon av lærere i engelskfaget med ulik alder og arbeidserfaring.

Hva innebærer det for deg å delta?

Hvis du velger å delta i prosjektet, innebærer det at du fyller ut et digitalt spørreskjema. Det vil ta deg ca. 10-12 minutter. Spørreskjemaet inneholder spørsmål om bakgrunnsinformasjon som din yrkeserfaring i læreryrket, alder, samt personlige preferanser for leseformat og tanker knyttet til lesestrategier og bruk av digitaliserte læreverker i engelskfaget.

Det er frivillig å delta

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan jeg oppbevarer og bruker dine opplysninger

Jeg vil bare bruke opplysningene om deg til formålene jeg har fortalt om i dette skrevet. Jeg behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

Universitetet i Bergen er behandlingsansvarlig for dataene, men personopplysninger vil kun bli behandlet av meg og min veileder. Spørreundersøkelsen utføres med verktøyet SurveyXact, som leveres av Rambøll. Som derfor har tilgang til datamaterialet.

All data innsamlet under spørreundersøkelsen lagres av datainnsamlingsverktøyet som er sikret med to-factors-innlogging og endringslogg av datahåndteringen. Verktøyet krypterer IP-adressen til deltakere fortløpende. Spørreundersøkelsen vil innhente informasjon om alder og arbeidserfaring som kun fremstilles i masteroppgaven som anonymisert og grovkategorisert data. Noen spørsmål har åpne svar, hvor du kan skrive svaret selv. Vennligst ikke inkluder direkte eller indirekte beskrivelser som kan identifisere dine elever,

lærere, eller andre kolleger ved din skole.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?

Opplysningene anonymiseres under innhenting og analysering av data. Opplysningene arkiveres som anonym data for potensiell senere forskning når prosjektet avsluttes/oppgaven er godkjent, noe som etter planen er 15. mai. 2022.

Samtykke og dine rettigheter:

Ved å delta i prosjektet samtykker du til behandling av opplysninger om deg. Du har mulighet til å benytte deg av rettighetene under dersom du velger å delta:

- Du har rett til innsyn, retting, sletting og begrensning i/av dine personopplysninger.
- Du har rett til å be om å få utlevert alle personopplysninger om deg for personlig lagring og bruk (dataportabilitet). Du kan med dette overføre opplysningene dine til et annet formål om du skulle ønske det. Dette medbringer ikke automatisk sletting av dataene i prosjektet.
- Du har rett til å klage til Datatilsynet. Du finner informasjon om dette her:
<https://www.datatilsynet.no/om-datatilsynet/kontakt-oss/hvordan-kan-jegklagetil-datatilsynet/>
- Ved behov kan du også kontakte UiBs personvernombud på personvernombud@uib.no

Hva gir oss rett til å behandle personopplysninger om deg?

Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Universitetet i Bergen har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvis du har spørsmål knyttet til NSD sin vurdering av prosjektet, kan du ta kontakt med:

- NSD – Norsk senter for forskningsdata AS på e-post
(personverntjenester@nsd.no) eller på telefon: 55 58 21 17.

Ta kontakt med meg eller min veileder Sigrid Ørevik på mailadressene under ved spørsmål knyttet til masterprosjektet eller for å benytte deg av rettighetene som nevnes ovenfor.

Takk for dine verdifulle innspill på forhånd!

Med vennlig hilsen,

Kaja Sandanger

(Masterstudent, Universitetet i Bergen)

Kaja.Sandanger@student.uib.no

Sigrid Ørevik

(Førsteamanuensis/veileder, Universitetet i Bergen)

Sigrid.Orevik@uib.no

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet «*The Digitized L2 Textbook; its Potential and Challenges of Promoting a Strategic Reader in a Digital Age*» og har fått anledning til å stille spørsmål. Ved å fullføre spørreskjemaet samtykker jeg til følgende:

- å delta i spørreskjema

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet

(Signert av prosjektdeltaker, dato)

Appendix D: The Questionnaire

Research project:

This study aims to explore teachers' perceptions of digitized English textbooks in Norwegian schools.

Some questions are open-ended questions that you may answer freely. Please do not include direct or indirect descriptions that may identify your students, teachers, or other colleagues at your school.

To provide a common understanding of the term "integrated functions of digitized textbooks," which refers to the tools available on different reading platforms for educational purposes.

E.g.: highlighting, note-taking inside the digital book, integrated audio-support to texts (either auto-generated or prerecorded), hyperlinks to the dictionary, glossaries, encyclopedias, the possibility of saving integrated note-taking and printing it out, creating bookmarks and in-text searches.

Which age group do you belong to?

(1)	(2)	(3)	(4)	(5)	(6)
24-27	28-34	35-44	45-54	55-64	65 and above

How many years have you worked as an L2 teacher?

(1)	(2)	(3)	(4)	11-	(5)	More
0-3 years	4-6 years	7-10 years	16 years			than 16 years.

Which digital tasks do you feel that you are sufficiently capable to complete?

- (1) Basic tasks (simple tasks, with help when needed)
- (2) Intermediate tasks (well-defined and routine tasks and problems, independent and according to my needs)

(3) Advanced tasks (different tasks and problems, guiding others, able to adapt to others in a complex context)

(4) Highly specialized tasks (resolve complex problems with many interacting factors, contribute to the professional practice, guide others, propose new ideas and processes to the field)

Have you received any explicit training on how to make use of ICT in your teaching?

When you are doing work-related reading, which format do you prefer using?

(1)	(2)	(3)	(4)	(5)
Printed version (book, booklet, paper)	Digital reading device (Kindle, Ipad, smartphone or similar devices)	Computer	Neither	Neither I do not have preferences

When you are doing reading on your leisure time, which format do you prefer using?

(1)	(2)	(3)	(4)	(5)
Printed version (book, booklet, paper)	Digital reading device (Kindle, Ipad, smartphone or similar devices)	Computer	Neither	Neither I do not have preferences

What experience do you have with digitized textbooks in your teaching practice?

(1)	(2)	(3)	(4)
No experience.	Received an introduction and/or general training.	Used it for less than a year.	Used it for more than a year.

The following questions will be statements that one can indicate the degree of agreement/disagreement

The reading strategies that can be used for reading on screen are different from the reading strategies that can be used for reading printed texts.

(1)	(2)	(3)	(4)	(5)
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

The integrated functions in digitized textbooks can promote reading strategies for reading English.

(1)	(2)	(3)	(4)	(5)
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Students' reading of a digitized L2 textbook includes more challenges in regard to promoting the use of reading strategies than a printed L2 textbook does.

(1)	(2)	(3)	(4)	(5)
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Digitized L2 textbooks may hamper the students' focus/concentration more than it can improve reading strategies in the L2.

(1)	(2)	(3)	(4)	(5)
Strongly	Disagree	Neutral	Agree	Strongly
disagree				agree

I experience that I have adequate experience and education to teach reading strategies on screen and on paper with the same level of quality.

(1)	(2)	(3)	(4)	(5)
Strongly	Disagree	Neutral	Agree	Strongly
disagree				agree

Do you believe that using digitized textbooks when teaching reading strategies may include some challenges?

(1)	(2)	(3)	(4)
Yes	To some extent.	Uncertain	No

Given your answer on the previous question, which challenges?

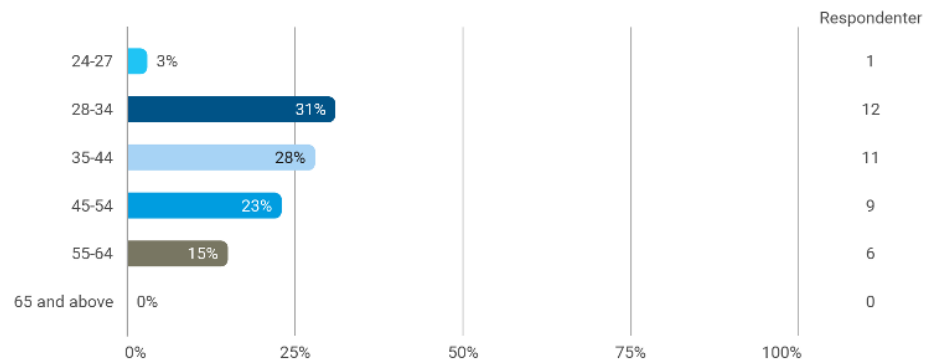
Do you believe that using digitized textbooks when teaching reading strategies may include some advantages?

(1)	(2)	(3)	(4)	
Yes	To some extent.	Uncertain	No	

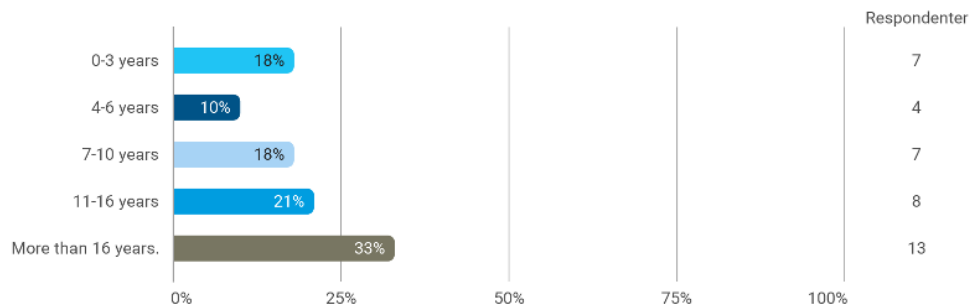
Given your answers on the previous question, which advantages?

Appendix E: Data from the Questionnaire

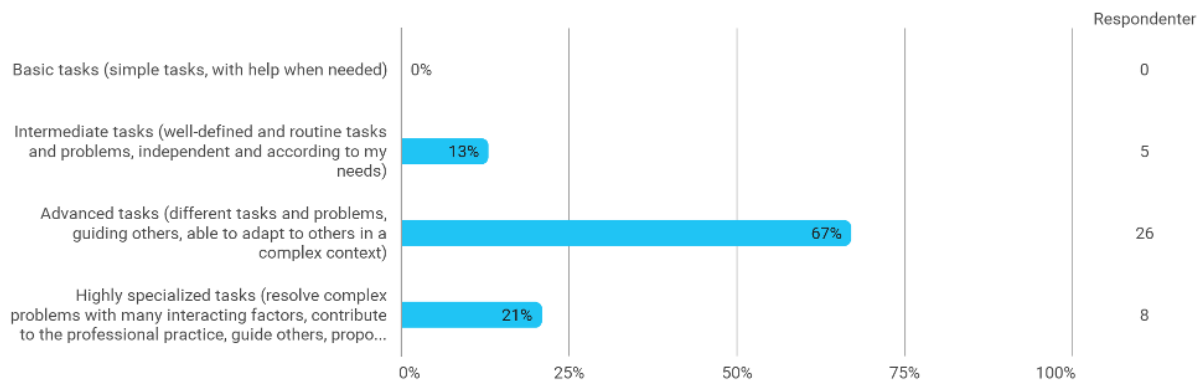
Which age group do you belong to?



How many years have you worked as an L2 teacher?



Which digital tasks do you feel that you are sufficiently capable to complete?

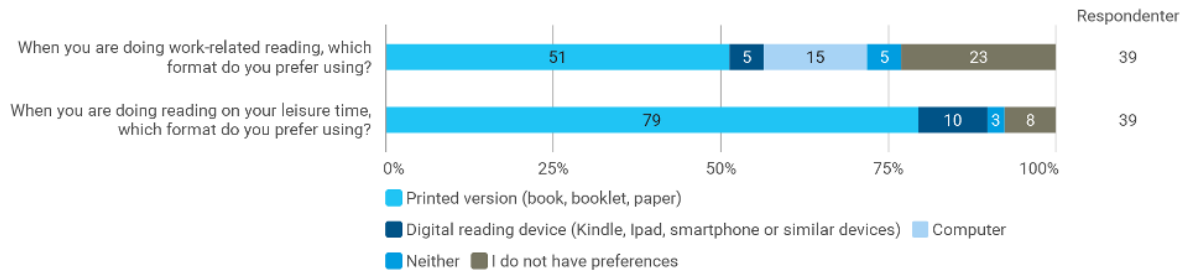


Have you received any explicit training on how to make use of ICT in your teaching?

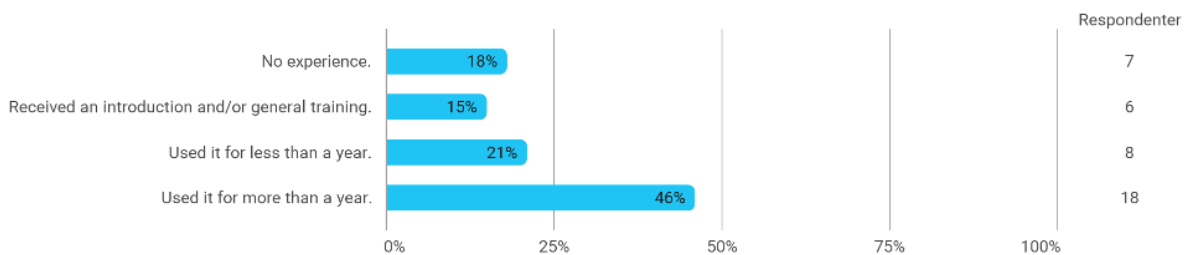
1. Yes
2. No
3. No
4. No.
5. no
6. Some
7. no

8. Yes, some courses
9. Yes
10. No
11. some
12. A little bit here and there, but not a lot.
13. No
14. No
15. No
16. Not really I'm mostly self taught. I'm quite competant with computers as I like to game in my spare time.
17. Yes
18. Probably not... cannot remember...
19. MOOCs on ICT inceducation and work shops at my school
20. No
21. 30 study points
22. No
23. No.
24. No
25. Partly
26. No
27. Yes
28. Yes
29. No. Am self-taught.
30. Yes
31. No
32. No.
33. Don't think so
34. a little bit
35. Nothing which comes to mind.
36. Yes, I have.
37. no
38. No
39. Yes

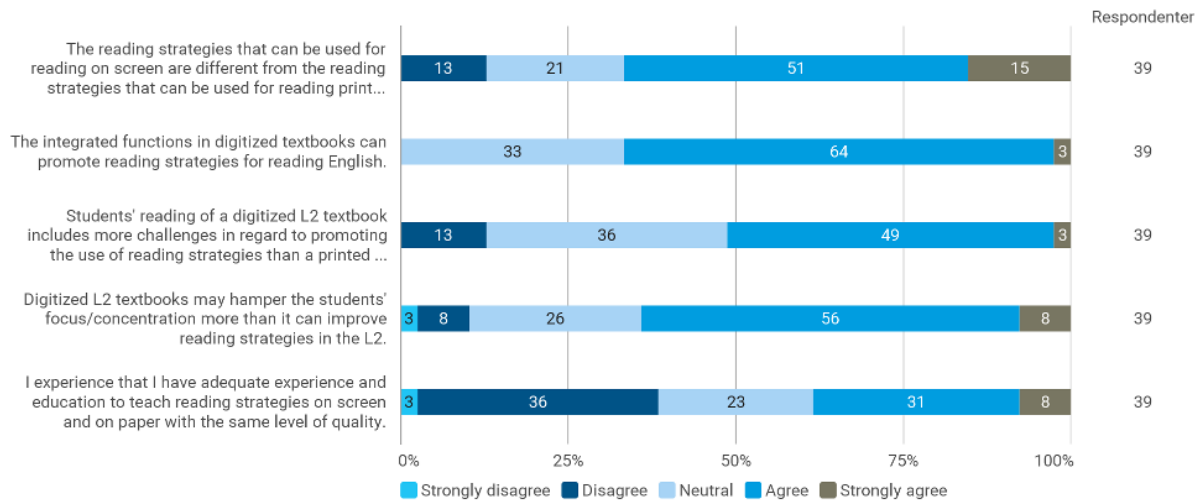
Reading preferences:



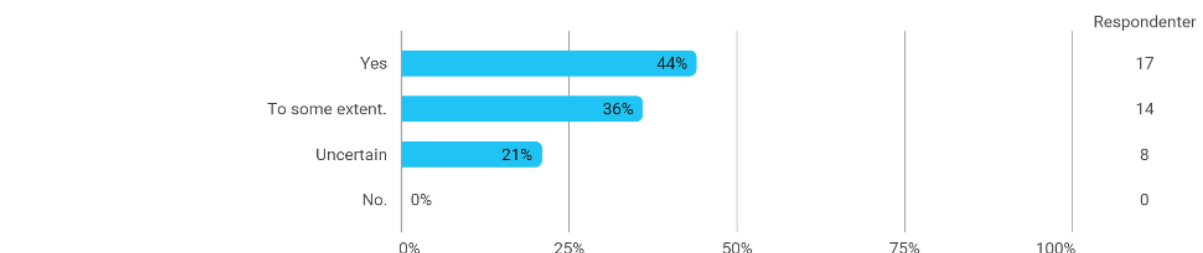
What experience do you have with digitized textbooks in your teaching practice?



The following questions will be statements that one can indicate the degree of agreement/disagreement



Do you believe that using digitized textbooks when teaching reading strategies may include some challenges?



Given your answer on the previous question, which challenges?

1. Many students struggle to concentrate while reading on screen.
2. The students miss out on the connections activated in the brain by writing by hand. Excessive time spent looking at a computer screen is demanding for the eyes, and the computer is often needed for many other activities than reading and consequently using texts on paper is an important opportunity for variation. The functions implemented into different digital textbooks take time to learn, and are often not worth the effort.
3. Seeing the red thread through it all? Losing concentration?
4. I feel that the eyes move differently across the screen than they do on the page. I think there is a difference to how we take in information from screens than from physical texts and I don't know enough about those cognitive differences to really know the full range of challenges.
5. I do not have knowledge about the digitized books.
6. Pupils' level (which can vary a lot in a group), length of text, topic, etc. all play a role and must be taken into account.
7. Screen colors &/or lighting; whether or not the digital book has the function for increasing/decreasing font size & font type
8. I know too little about both the tool and its possibilities (too little training?) and about reading digitally. I therefore feel uncertain on how to teach it and feel unsure about what I need to focus on.
9. It's easier for students to "get lost" when reading. By clicking on hyperlinks they may get explanations and prompts but deep reading and deep learning may be hampered simply because there may be too many distractions. It's vital that students are trained to distinguish between the strategies that are most suitable for the purpose of their reading and that they learn to choose the right reading strategy and the right medium (print or digital).
10. I don't believe there has been enough research into the use of digital textbooks by students as well as teachers who can use digital textbooks had been studied.
11. Uncertain, as I do not have experience
12. The challenge of reading longer texts on screen: may be harder to focus, for example due to the fact that we are mostly used to reading shorter text chunks on screen.

It may also be harder to focus, reading something on a screen where you also can find all sorts of other things to look at that may distract you. Reading a textbook, provided that other devices are put away, I believe makes it easier to stay focused.

13. Even though some will struggle with focus no matter what, when students are already on a computer it is more difficult to keep them away from social media, than when they are reading printed versions, where looking out the window or at another student is the "worst" that can happen without a teacher being aware.
14. Focus and concentration and for the students with various reading challenges, digital reading is mostly negative
15. Students staying "on-tasks", and that their attention is focused on reading (and not other material).
16. I've not worked with digital reading strategies enough to comment.
17. Unsure
18. Too many distractions and not enough overview over the text.
19. Two main challenges with digitized textbooks:
 - 1) lack of concentration due to disturbance from SoMe
 - 2) formats often require too much scrolling or are imprecise as to getting directly to a certain and only to that page. I.e. Too much disturbance in on-screen surroundings
20. Distractions are more easily available on the computer than in the book
21. It would depend on the device used. A computer would provide more potential elements of distraction compared to a printed textbook or a specialized reading device (e.g. a Kindle).
22. Focus, not switching over to games or some, headaches from looking too much at a screen
23. Some challenges, but I'm not sure I would call them "challenges", rather small issues. Firstly, some students prefer to read on paper and express that they feel like they struggle with the reading of longer texts on the screen. The other thing is notifications showing up, like emails etc. You can ask them to turn off notifications, but they don't always. But regardless, students are easily distracted by other situations or personal digital devices, so I don't find the reading on screen as a particular issue.

24. For 8th grade, where i have experience, they her confused. Finding the right page/chapter/part of the digital textbook is hard for many. The teacher can "summon" the class to the spesific page, but with a book you just tell the pagenumber. The point beeing that they struggle with navigation, and this impacts the possibilites inn regards to Reading strategies depending om the text and the layout. Looking at the text and questions at the same time is ofte impossible, and switching between them requires loading a new screen. Some students manage it, but many dont.

Many simply dont master the the technical aspect, and it takes up a lot of time and consentration.

25. Students become tired of reading on screen all day long and it demands more of them in terms of concentration.

26. X

27. Mainly concentration with longer texts (full page or more). Students seem to skim through texts more easily, but have a harder time interacting more thoroughly with the texts. They skip from text to text, or from text to task, more quickly, often missing crucial information and nuance. They tend to use the search options quite effectively, but in doing so miss important context because they only look for specific information.

28. More easily distracted

Different reading mode - different strategies

Cannot draw, write, underline, read with symbols and mark phrases in the same physical (eye/hand/mind) manner as research show is useful

Computers are not qualitative good enough

Unless it is Skolestudio, the design is seldom good enough

29. a) Text on the screen is more abstract, for many it is important to feel (turn the page) the moving forward. In addition, PCs/IPads are not free from disturbances which pop up or cab be easily turned on, and are not silence friendly- all these elements are important pre-conditions for strategies to have any effect.

b) Some motoric steps cannot be included in digital book reading: for example, covering the rest of the text and concentrating on a sentence at a time which is relevant for the pupils with concentration challenges.

30. Poor internetconnections and internet sources that are down.

More difficult to get an overview of the text, see structure in the overall text and get oriented in the text online.

Easier to push the wrong buttons and play a game when the teacher turn his/her back.

31. -Keeping the student's focus when using a digital device

-Difficult to monitor what they are doing because you only see the back of the laptop.

- Some students are used to scrolling and might start scrolling down and not following the order of the text

32. Having to work out how the system works, waiting for things to load might be demotivating, app not always optimized for screen size, additional cruft/chrome.

33. Not sure

34. Not sure, it's different for everyone.

35. Accessibility to digitalised textbooks might be affected by low student ICT competence and unreliable internet connection at school. While some of the same reading strategies may be used both on paper and digitally, certain digital reading strategies may require a higher digital competence, which not all students possess. The students may then experience acquiring and applying the strategies as making reading more complicated, while it is supposed to do the opposite. In other words, if high school students lack basic ICT competence, that is, if they lack a decent starting point in terms of digital skills, working with digitalised textbooks and digital reading strategies, may result in frustration on both the teacher's and student's part, as well as possibly a poorer result in terms of the students working their way towards the curriculum's competence aims.

36. Uromoment, forstyringer. Skrolling, varsel og diverse som dukkar opp på skjermene til elevane.

37. The students' focus is impaired - Lost time on digital challenges for the students

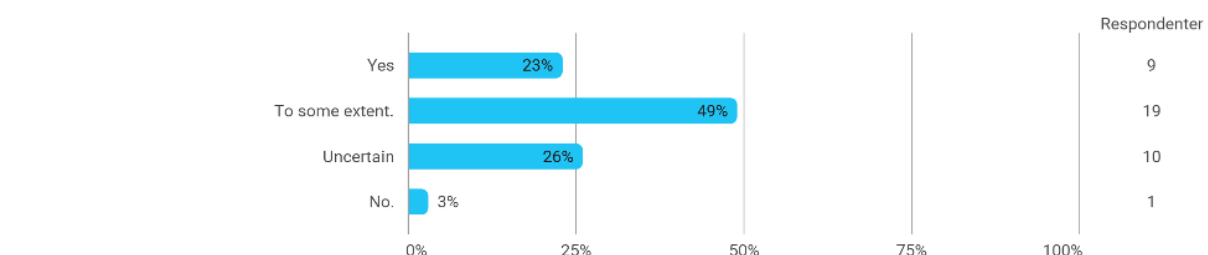
38. Not being able to take notes with a pencil is my main concern. Although there is an increasing number of digital solutions for writing, they are still inferior to the pencil when it comes to reliability, flexibility and ease of use.

Underlining, writing and drawing still work best with physical writing tools, and the notes never fail, lag or get deleted.

I am also aware of the increased learning benefits of using handwriting as part of the learning process.

39. Students look at other Internet pages or the Teams' chat at the same time. They forget quicker what they have read. The page or text disappears for them. They lose the sense of how long a text is. They lose some of the art or illustrations that goes with a textbook text. If they touch a button, it might jump, go larger/smaller or start playing an audio file without the sts' intention.

Do you believe that using digitized textbooks when teaching reading strategies may include some advantages?



Given your answers on the previous question, which advantages?

1. It's easier for students to look up word, terms, topics, etc. Many profit from listening to a text while reading.

2. I am generally of the opinion that all digital devices and programs are tools that should be used out of need. There is no need to use a tool just because it exists, and updates and new versions of digital tools are not necessarily better than other tools for the job.
3. Often shorter tasks, pupils are used to it, easier to add visual elements
4. Screens are simply more accessible, which means that students and people in general are more likely to read and engage with a screen than a piece of paper. However, what this means for retention and comprehension is still an unknown area to me.
5. uncertain
6. See answer above.
7. If the digital book has hyperlinks for definitions to words, students find it very helpful; audio texts that are recorded with real voices and not synthetic voices to listen to pronunciation of new words when working individually are helpful as well; the ability to enlarge font size and even font types is also a help.
8. Most written text is digital these days. Everyone should therefore gain knowledge and experience on reading off a screen.
9. See answer above.
10. I believe that students are much more adept at using digital media than many teachers.
11. Uncertain, as I do not have experience
12. There is the possibility of easily looking up explanations, definitions, hyperlinks that can elaborate on the theme (if these are provided).

I believe that used as intended and with proper instructions and training, there are many possibilities, such as notetaking and highlighting in the book itself, not on a separate piece of paper. I know too little of all the possibilities, though.

13. Easier with soundfiles, easier to look up certain words or mark sentences.
14. They have their book with them at all times
15. More opportunity to interact with the text (mark, make notes, add links, etc.)
16. I would like to think that digital reading strategies will be valued more as we as a society become more digitalised.
17. Unsure
18. Can look up words faster and have them read out loud.
19. Easy access to dictionary and encyclopedia to enhance understanding.

Possibilities for customized/differentiated learning paths (much wanted but I have not yet discovered this anywhere)

20. It is easier for the students to search within the book.

Easy to underline/highlight words/phrases/sentences

21. Given that the tool used contains supporting features (like audio support, clickable words for explanations or hyperlinks to navigate the book, on screen tasks instead of a separate document or a notebook) they could provide some advantages. Furthermore, digitized books with features that the teacher can use to monitor the students' work and progress are a great tool for formative assessment. The value of a digital book highly depends on how well developed it is as a tool. An underdeveloped digital book, that is merely a digital version of its printed counterpart, may not provide advantages other than perhaps the cost issue.
22. Positive for those with reading disabilities: possible to Change the size of letters, audiofiles
23. The biggest advantage is without question the ability for students to listen to the text. This is especially helpful for students with dyslexia.
24. The digital textbook offers to read the text out loud, giving the learner the chance to listen and read, helping with both understanding and pronunciation.

You also have the cursor, and/or ability to highlight the text as you read, which some learners do to "prevent losing their way". (Alternative to using their finger on the page)

25. Yes, there are advantages as well, such as the ability to highlight paragraphs/sentences (which a paper copy does not permit you to do as students borrow it from the library for the entire school year), and learning new vocabulary. Some students simply prefer reading material online. But for the overall majority, I think they become tired of reading digitalized material and want a paper copy. I also think that being able to read material on paper is an asset and will better prepare the students for further studies at university, as there are (I imagine) more paper copies to read there.
26. X
27. Using them to skim texts/get a quick overview of texts and to look up specific information is undoubtedly useful. Audio files are also very useful, but not if read by a digital voice.
28. Said uncertain.
29. Some pupils may be more motivated to read/work on a text barely due to the fact that reading is digitalized i.e. done with the help of computer.
30. Updated material, better pictures and interaction with the text (such as click on the word and get the translation).

Ability to listen to part or the whole text as you read.

31. It is a format they often use for reading (i.e. when they "google" information online)

They might search for words digitally by using some keys on the keyboard

32. Quick access to dictionary definitions, have parts read out loud, richer media experience.
33. Easier to find meaning of words/translations etc
34. Not sure

35. Seeing as the world in general is rapidly becoming more digital, students should definitely learn how to encounter digital texts and should thus work with such texts and with applying suitable reading strategies to said texts.

Digitalised textbooks also open for a lot of new possibilities in terms of what reading strategies can be used, how they may be used, and accessibility to texts/information, including hyper links and pop-up notes, interactiveness.

Given that students do have the competence needed to operate a computer and access digitalised textbooks on their own, being able to keep all the material needed in one place and having it available at all times will be very convenient.

36. ...

37. none




38. I think it would be easier to keep track of your notes, if you could search for words that you wrote earlier. The classical method would typically involve having to turn back, page by page, while digital systems would allow for automated searches.

I'm not sure how much of a benefit that is, though. I also expect there might be several other benefits.






39. Less books (none at my Department) to carry and remember. The audio files/readings of the text especially help those with less English knowledge or dyslexia.









Appendix F: Code System for Qualitative Data Analysis

1) Item 4: Explicit ICT training








Color code	Code name	Description: Respondents that...
	<i>Yes</i>	reported that they had received explicit ICT training.
	<i>Some</i>	reported that they had received explicit ICT training but underlined the limited quantity or quality of the training.
	<i>No</i>	reported that they had not received explicit ICT training.











2) Item 16: Challenges

Color code	Code name	Description: Challenges related to..
	<i>Practical aspects (ICT)</i>	The practical aspects of DTs. This may include aspects of computers in general, the “screen” as format, the software that delivers the DTs, technical functions of DTs and internet connection.
	<i>Concentration</i>	The students' concentration/focus.
	<i>Cognitive processes</i>	The cognitive processes of learning, processing information, reading, and reading strategies. *Concentration also belongs to cognition but was coded separately due to its prominent recurrence.
	<i>Text form</i>	The multimodal aspects of a text and/or the length of a text or task.
	<i>Students' preference</i>	The functions that allow the user to navigate the DT with ease

	<i>Students' competence</i>	The students' competence: either digital competence or competence in the L2.
	<i>Developing relevant digital competence</i>	The digital format of DTs offers an arena for the students to practice relevant skills in terms of digital skills and/or reading skills for digital formats.
	<i>Insufficient research</i>	Insufficient research on the topic of digitized textbooks.
	<i>Students' personal preferences</i>	Students' personal preferences for reading formats
	<i>Student focus</i>	The challenges are directed towards students.
	<i>Teacher focus</i>	The challenges are directed towards teachers.
	<i>Uncertain</i>	The respondent expresses uncertainty regarding the DTs challenges
	<i>No response</i>	The respondent has not given an answer on the questionnaire item. *This is likely to be in accordance with their answer on the previous question.

3) Item 18: Advantages

Color code	Code name	Description: Advantages related to..
	<i>Accessibility and/or convenience</i>	The accessibility and/or convenience of DTs. The responses that have reported that a task becomes "easier", "faster" and relating descriptions have also been labeled with this code.
	<i>Extended material</i>	The extended material in the form of hyperlinks, glossaries, dictionaries, and so on. Material beyond the book to enrich the material or scaffold learning.
	<i>Audio-support</i>	The possibility of having the text read aloud by either (1) a synthesized voice or (2) a prerecorded audio, in a variety of the L2. *Several respondents made a clear distinction between the two possibilities.
	<i>Interactive text tools</i>	The interactive text tools which refer to the integrated tools available in the DTs. The specific tools that allow the reader to interact with the text, such as underlining, highlighting, and note-taking.
	<i>Navigation</i>	The functions that allow the user to navigate the DT with ease
	<i>Students' competence</i>	The students' competence: either digital competence or competence in the L2. *Some responses outline this as a prerequisite for other aspects to be advantageous.
	<i>Developing relevant digital competence</i>	The digital format of DTs offers an arena for the students to practice relevant skills in terms of digital skills and/or reading skills for digital formats.

	<i>Motivation and/or preference</i>	The use of DTs might provide motivation and/or be in compliance with the users' preference.
	<i>Text form</i>	The multimodal aspects of a text and/or the length of a text or task.
	<i>Customization</i>	The functions that allow the user to customize the DTs to personal preferences and needs. Such as font type and size.
	<i>Student focus</i>	The advantages are directed towards students.
	<i>Learning disability-friendly</i>	The advantages are directed towards students with learning disabilities, such as dyslexia.
	<i>Teacher focus</i>	The advantages are directed towards teachers.
	<i>Challenges/ concerns</i>	The respondent expresses challenges and/or concerns about DTs. This code has been applied when a respondent has listed advantages but further provides concerns or challenges.
	<i>Uncertain</i>	The respondent expresses uncertainty regarding the DTs advantages
	<i>No advantages</i>	The respondent expresses to perceive no advantages with DTs
	<i>No response</i>	The respondent has not given an answer on the questionnaire item. *This is likely to be in accordance with their answer on the previous question.

Appendix G: Analysis of Qualitative Data from the Questionnaire

1) Item 4: Explicit ICT training

	1	Have you received any explicit training on how to make use of ICT in your teaching?
	2	• Yes
No	3	• No
No	4	• No
No	5	• No.
No	6	• no
Some	7	• Some
No	8	• no
Yes	9	• Yes, some courses
Yes	10	• Yes
No	11	• No
Some	12	• some
Some	13	• A little bit here and there, but not a lot.
No	14	• No
No	15	• No
No	16	• No
No	17	• Not really I'm mostly self taught. I'm quite competant with computers as I like to game in my spare time.
Yes	18	• Yes
No	19	• Probably not... cannot remember...
Yes	20	• MOOCs on ICT inceducation and work shops at my school
No	21	• No
Yes	22	• 30 study points
No	23	• No
No	24	• No.
No	25	• No
Some	26	• Partly
No	27	• No
Yes	28	• Yes
Yes	29	• Yes
No	30	• No. Am self-taught.
Yes	31	• Yes
No	32	• No
No	33	• No.

No	34	• Don't think so
Some	35	• a little bit
No	36	• Nothing which comes to mind.
Yes	37	• Yes, I have.
No	38	• no
No	39	• No
Yes	40	• Yes

2) Item 16: Challenges

	1	Given your answer on the previous question, which challenges?
Concentration	2	<ul style="list-style-type: none"> • Many students struggle to concentrate while reading on screen.
Student focus	3	<ul style="list-style-type: none"> • The students miss out on the connections activated in the brain by writing by hand. Excessive time spent looking at a computer screen is demanding for the eyes, and the computer is often needed for many other activities than reading and consequently using texts on paper is an important opportunity for variation.
Cognitive processes	4	<ul style="list-style-type: none"> • The functions implemented into different digital textbooks take time to learn, and are often not worth the effort.
Cognitive processes	5	<ul style="list-style-type: none"> • Seeing the red thread through it all? Losing concentration?
Practical aspects (ICT)	6	<ul style="list-style-type: none"> • I feel that the eyes move differently across the screen than they do on the page. I think there is a difference to how we take in information from screens than from physical texts and I don't know enough about those cognitive differences to really know the full range of challenges.
Cognitive processes	7	<ul style="list-style-type: none"> • I do not have knowledge about the digitized books.
Concentration	8	<ul style="list-style-type: none"> • Pupils' level (which can vary a lot in a group), length of text, topic, etc. all play a role and must be taken into account.
Teacher focus	9	<ul style="list-style-type: none"> • Screen colors &/or lighting; whether or not the digital book has the function for increasing/decreasing font size & font type
Student focus	10	<ul style="list-style-type: none"> • I know to little about both the tool and its possibilities (too little training?) and about reading digitally. I therefore feel uncertain on how to teach it and feel unsure about what I need to focus on.
Uncertain	11	<ul style="list-style-type: none"> • It's easier for students to "get lost" when reading. By clicking on hyperlinks they may get explanations and prompts but deep
Teacher focus		
Uncertain		
Students' competence		
Text form		
Practical aspects (ICT)		
Teacher focus		
Uncertain		
Student focus		
Concentration		
Practical aspects (ICT)		
Cognitive processes		

1/7

Concentration	11
Students' competence	11
Insufficient research	11
Student focus	11
Teacher focus	11
Uncertain	12
Teacher focus	12
Text form	13
Concentration	13
Text form	13
Practical aspects (ICT)	13
Concentration	14
Concentration	15
Student focus	16
Concentration	16
Students' competence	16
Student focus	17
Concentration	17

reading and deep learning may be hampered simply because there may be too many distractions. It's vital that students are trained to distinguish between the strategies that are most suitable for the purpose of their reading and that they learn to choose the right reading strategy and the right medium (print or digital).

- I don't believe there has been enough research into the use of digital textbooks by students as well as teachers who can use digital textbooks had been studied.
- Uncertain, as I do not have experience
- The challenge of reading longer texts on screen: may be harder to focus, for example due to the fact that we are mostly used to reading shorter text chunks on screen.

It may also be harder to focus, reading something on a screen where you also can find all sorts of other things to look at that may distract you. Reading a textbook, provided that other devices are put away, I believe makes it easier to stay focused.

- Even though some will struggle with focus no matter what, when students are already on a computer it is more difficult to keep them away from social media, than when they are reading printed versions, where looking out the window or at another student is the "worst" that can happen without a teacher being aware.
- Focus and concentration and for the students with various reading challenges, digital reading is mostly negative
- Students staying "on-tasks", and that their attention is focused

2/7

Student focus	28
Practical aspects (ICT)	28
Students' competence	28
Students' competence	29
Student focus	29
Practical aspects (ICT)	29
Concentration	30
Student focus	30
Concentration	30
No response	31
Concentration	32
Text form	32
Student focus	32
Cognitive processes	34
Concentration	33
Cognitive processes	34
Practical aspects (ICT)	35
Cognitive processes	35

- For 8th grade, where I have experience, they are confused. Finding the right page/chapter/part of the digital textbook is hard for many. The teacher can "summon" the class to the specific page, but with a book you just tell the page number. The point being that they struggle with navigation, and this impacts the possibilities in regards to reading strategies depending on the text and the layout. Looking at the text and questions at the same time is often impossible, and switching between them requires loading a new screen. Some students manage it, but many don't.
- Many simply don't master the technical aspect, and it takes up a lot of time and concentration.
- Students become tired of reading on screen all day long and it demands more of them in terms of concentration.
- X
- Mainly concentration with longer texts (full page or more). Students seem to skim through texts more easily, but have a harder time interacting more thoroughly with the texts. They skip from text to text, or from text to task, more quickly, often missing crucial information and nuance. They tend to use the search options quite effectively, but in doing so miss important context because they only look for specific information.
- More easily distracted

Different reading mode - different strategies

Cannot draw, write, underline, read with symbols and mark phrases in the same physical (eye/hand/mind) manner as

4/7

Teacher focus	18
Uncertain	18
Uncertain	19
Concentration	20
Practical aspects (ICT)	21
Concentration	22
Practical aspects (ICT)	22
Practical aspects (ICT)	23
Concentration	24
Practical aspects (ICT)	24
Practical aspects (ICT)	25
Concentration	25
Concentration	26
Student focus	27
Students' personal preference	27
Concentration	27
Practical aspects (ICT)	27
Concentration	27

Practical aspects (ICT)	36
Practical aspects (ICT)	37
Practical aspects (ICT)	38
Cognitive processes	38
Concentration	38
Practical aspects (ICT)	38
Cognitive processes	38
Practical aspects (ICT)	39
Concentration	39
Practical aspects (ICT)	40
Practical aspects (ICT)	41
Concentration	42
Student focus	42
Teacher focus	43
Concentration	43
Student focus	44
Practical aspects (ICT)	44

on reading (and not other material).

- I've not worked with digital reading strategies enough to comment.
- Unsure
- Too many distractions and not enough overview over the text.
- Two main challenges with digitized textbooks:
 - lack of concentration due to disturbance from SoMe
 - formats often require too much scrolling or are imprecise as to getting directly to a certain and only to that page. I.e. Too much disturbance in on-screen surroundings
- Distractions are more easily available on the computer than in the book
- It would depend on the device used. A computer would provide more potential elements of distraction compared to a printed textbook or a specialized reading device (e.g. a Kindle).
- Focus, not switching over to games or some, headaches from looking too much at a screen
- Some challenges, but I'm not sure I would call them "challenges", rather small issues. Firstly, some students prefer to read on paper and express that they feel like they struggle with the reading of longer texts on the screen. The other thing is notifications showing up, like emails etc. You can ask them to turn off notifications, but they don't always. But regardless, students are easily distracted by other situations or personal digital devices, so I don't find the reading on screen as a particular issue.

3/7

research show is useful

Computers are not qualitative good enough

Unless it is Skolestudio, the design is seldom good enough

- a) Text on the screen is more abstract, for many it is important to feel (turn the page) the moving forward. In addition, PCs/IPads are not free from disturbances which pop up or can be easily turned on, and are not silence friendly- all these elements are important pre-conditions for strategies to have any effect.
- b) Some motoric steps cannot be included in digital book reading: for example, covering the rest of the text and concentrating on a sentence at a time which is relevant for the pupils with concentration challenges.
- Poor internet connections and internet sources that are down.
- More difficult to get an overview of the text, see structure in the overall text and get oriented in the text online. - Easier to push the wrong buttons and play a game when the teacher turn his/her back.
- Keeping the student's focus when using a digital device
- Difficult to monitor what they are doing because you only see the back of the laptop.
- Some students are used to scrolling and might start scrolling down and not following the order of the text

5/7

Practical aspects (ICT)	}	45
Cognitive processes		
Practical aspects (ICT)	}	46
Uncertain		
	}	47
Uncertain		
Students' competence	}	48
Practical aspects (ICT)		
	}	49
Students' competence		
Teacher focus	}	50
Student focus		
Cognitive processes	}	51
Concentration		
Practical aspects (ICT)	}	52
Student focus		
Student focus	}	53
Concentration		
Practical aspects (ICT)	}	54
Concentration		
Practical aspects (ICT)	}	55
Practical aspects (ICT)		

- Having to work out how the system works, waiting for things to load might be de-motivating, app not always optimized for screen size, additional cruff/chrome.
- Not sure
- Not sure, it's different for everyone.
- Accessibility to digitalised textbooks might be affected by low student ICT competence and unreliable internet connection at school. While some of the same reading strategies may be used both on paper and digitally, certain digital reading strategies may require a higher digital competence, which not all students possess. The students may then experience acquiring and applying the strategies as making reading more complicated, while it is supposed to do the opposite. In other words, if high school students lack basic ICT competence, that is, if they lack a decent starting point in terms of digital skills, working with digitalised textbooks and digital reading strategies, may result in frustration on both the teacher's and student's part, as well as possibly a poorer result in terms of the students working their way towards the curriculum's competence aims.
- Uromoment, forstyrningar. Skrolling, varsel og diverse som dukkar opp på skjermene til elevane.
- The students' focus is impaired - Lost time on digital challenges for the students
- Not being able to take notes with a pencil is my main concern. Although there is an increasing number of digital solutions for writing, they are still inferior to the pencil when it comes to reliability, flexibility and ease of use.

6/7

Practical aspects (ICT)	}	52
Cognitive processes		
Cognitive processes	}	53
Concentration		
Practical aspects (ICT)	}	54
Cognitive processes		
Practical aspects (ICT)	}	55
Practical aspects (ICT)		

- Underlining, writing and drawing still work best with physical writing tools, and the notes never fail, lag or get deleted.
- I am also aware of the increased learning benefits of using handwriting as part of the learning process.
- Students look at other Internet pages or the Teams' chat at the same time. They forget quicker what they have read. The page or text disappears for them. They lose the sense of how long a text is. They lose some of the art or illustrations that goes with a textbook text. If they touch a button, it might jump, go larger, smaller or start playing an audio file without the sts' intention.

7/7

3) Item 18: Advantages

	1	Given your answers on the previous question, which advantages?
Extended material Accessibility and/or convenience Student focus	2	<ul style="list-style-type: none"> It's easier for students to look up word, terms, topics, etc. Many profit from listening to a text while reading.
Audio-support No advantages	3	<ul style="list-style-type: none"> I am generally of the opinion that all digital devices and programs are tools that should be used out of need. There is no need to use a tool just because it exists, and updates and new versions of digital tools are not necessarily better than other tools for the job.
Text form Accessibility and/or convenience Students' competence level	4	<ul style="list-style-type: none"> Often shorter tasks, pupils are used to it, easier to add visual elements
Text form Accessibility and/or convenience Motivation and/or preference Uncertain	5	<ul style="list-style-type: none"> Screens are simply more accessible, which means that students and people in general are more likely to read and engage with a screen than a peice of paper. However, what this means for retention and comprehension is still an unknown area to me.
Uncertain	6	<ul style="list-style-type: none"> uncertain
No response	7	<ul style="list-style-type: none"> See answer above.
Extended material Student focus Audio-support Customization	8	<ul style="list-style-type: none"> If the digital book has hyperlinks for definitions to words, students find it very helpful; audio texts that are recorded with real voices and not synthetic voices to listen to pronunciation of new words when working individually are helpful as well; the ability to enlarge font size and even font types is also a help.
Developing relevant digital compi	9	<ul style="list-style-type: none"> Most written text is digital these days. Everyone should therefore gain knowledge and experience on reading off a screen.
No response	10	<ul style="list-style-type: none"> See answer above.
Students' competence level Student focus Teacher focus	11	<ul style="list-style-type: none"> I believe that students are much more adept at using digital media than many teachers.
Uncertain Teacher focus	12	<ul style="list-style-type: none"> Uncertain, as I do not have experience
Accessibility and/or convenience Extended material	13	<ul style="list-style-type: none"> There is the possibility of easily looking up explanations, definitions, hyperlinks that can elaborate on the theme (if these are provided).

Students' competence level	14
Interactive text tools	14
Teacher focus	14
Uncertain	14
Accessibility and/or convenience	15
Extended material	15
Audio-support	15
Interactive text tools	16
Student focus	16
Accessibility and/or convenience	17
Interactive text tools	17
Developing relevant digital comp	18
Uncertain	19
Extended material	20
Accessibility and/or convenience	21
Audio-support	21
Extended material	21
Customization	22
Student focus	23
Navigation	23
Accessibility and/or convenience	24
Interactive text tools	24
Audio-support	25
Extended material	25
Navigation	25
Interactive text tools	25
Teacher focus	25
*challenges/concerns	

I believe that used as intended and with proper instructions and training, there are many possibilities, such as notetaking and highlighting in the book itself, not on a separate piece of paper. I know too little of all the possibilities, though.

- Easier with soundfiles, easier to look up certain words or mark sentences.
- They have their book with them at all times
- More opportunity to interact with the text (mark, make notes, add links, etc.)
- I would like to think that digital reading strategies will be valued more as we as a society become more digitalised.
- Unsure
- Can look up words faster and have them read out loud.
- Easy access to dictionary and encyclopedia to enhance understanding.

Possibilities for customized/differentiated learning paths (much wanted but I have not yet discovered this anywhere)

- It is easier for the students to search within the book.

Easy to underline/highlight words/phrases/sentences

- Given that the tool used contains supporting features (like audio support, clickable words for explanations) or hyperlinks to navigate the book, on screen tasks instead of a separate document or a notebook) they could provide some advantages. Furthermore, digitized books with features that the teacher can use to monitor the students' work and progress are a great tool for formative assessment. The value of a digital book highly depends on how well developed it is as a tool. An underdeveloped digital book, that is merely a digital version of its

*challenges/concerns	
Student focus	26
Learning-disability-friendly	26
Customization	27
Audio-support	27
Audio-support	27
Learning-disability-friendly	27
Audio-support	28
Interactive text tools	29
Student focus	29
Interactive text tools	30
Student focus	31
Motivation and/or preference	31
*challenges/concerns	
No response	31
Navigation	32
Extended material	32
Audio-support	32
Uncertain	33
Student focus	34
Motivation and/or preference	34

printed counterpart, may not provide advantages other than perhaps the cost issue.

- Positive for those with reading disabilities: possible to Change the size of letters, audiofiles
- The biggest advantage is without question the ability for students to listen to the text. This is especially helpful for students with dyslexia.
- The digital textbook offers to read the text out loud, giving the learner the chance to listen and read, helping with both understanding and pronunciation.

You also have the cursor, and/or ability to highlight the text as you read, which some learners do to "prevent losing their way". (Alternative to using turr finger on the page)

- Yes, there are advantages as well, such as the ability to highlight paragraphs/sentences (which a paper copy does not permit you to do as students borrow it from the library for the entire school year), and learning new vocabulary. Some students simply prefer reading material online. But for the overall majority, I think they become tired of reading digitalized material and want a paper copy. I also think that being able to read material on paper is an asset and will better prepare the students for further studies at university, as there are (I imagine) more paper copies to read there.
- X
- Using them to skim texts/get a quick overview of texts and to look up specific information is undoubtedly useful. Audio files are also very useful, but not if read by a digital voice.
- Said uncertain
- Some pupils may be more motivated to read/work on a text barely due to the fact that reading is digitalized i.e. done with the help of

Accessibility and/or convenience	35
Extended material	35
Audio-support	36
Accessibility and/or convenience	37
Student focus	38
Interactive text tools	38
Navigation	38
Accessibility and/or convenience	39
Extended material	39
Audio-support	39
Extended material	40
Extended material	40
Accessibility and/or convenience	41
Uncertain	42
Student focus	42
Developing relevant digital comp	42
Developing relevant digital comp	43
Extended material	43
Accessibility and/or convenience	43
Interactive text tools	43
Student focus	44
Students' competence level	44
Accessibility and/or convenience	44
No response	45

computer.

- Updated material, better pictures and interaction with the text (such as click on the word and get the translation).
- Ability to listen to part or the whole text as you read.
- It is a format they often use for reading (i.e. when they "google" information online)
- They might search for words digitally by using some keys on the keyboard
- Quick access to dictionary definitions, have parts read out loud, richer media experience.
- Easier to find meaning of words/translations etc
- Not sure
- Seeing as the world in general is rapidly becoming more digital, students should definitely learn how to encounter digital texts and should thus work with such texts and with applying suitable reading strategies to said texts.

Digitalised textbooks also open for a lot of new possibilities in terms of what reading strategies can be used, how they may be used, and accessibility to texts/information, including hyper links and pop-up notes, interactivenss.

Given that students do have the competence needed to operate a computer and access digitalised textbooks on their own, being able to keep all the material needed in one place and having it available at all times will be very convenient.

- ...

Accessibility and/or convenience	46
Interactive text tools	47
Navigation	47
Uncertain	48
Accessibility and/or convenience	49
Audio-support	49
Student focus	49
Students' competence level	49
Learning-disability-friendly	49

- none
- I think it would be easier to keep track of your notes, if you could search for words that you wrote earlier. The classical method would typically involve having to turn back, page by page, while digital systems would allow for automated searches.
- I'm not sure how much of a benefit that is, though. I also expect there might be several other benefits.
- Less books (none at my Department) to carry and remember. The audio files/readings of the text especially help those with less English knowledge or dyslexia.

Appendix H: Frequency Rate of the Code System - Challenges of DTs

	Code	Cod. seg. (all... ▼
●	Practical aspects (ICT)	28
●	Concentration	27
●	Student focus	17
●	Cognitive processes	15
●	Uncertain	8
●	Teacher focus	8
●	Students' competence	8
●	Text form	4
●	Students' personal preferences	1
●	No response	1
●	Insufficient research	1

Appendix I: Frequency Rate of the Code System - Advantages of DTs

	Code	Cod. seg. (all... ▼
●	Accessibility and/or convenience	17
●	Extended material	13
●	Student focus	13
●	Audio-support	12
●	Interactive text tools	10
●	Uncertain	8
●	Navigation	5
●	Students' competence level	5
●	Developing relevant digital competence	4
●	No response	4
●	Teacher focus	4
●	Customization	3
●	Learning-disability-friendly	3
●	Motivation and/or preference	3
●	*challenges/concerns	2
●	Text form	2
●	No advantages	2