How Digital Tools are Used and Perceived by Students with Dyslexia and Teachers within the Swedish Classroom

*English for Subject Teachers, 61-90 credits.*
Individual Project (15 credits)

*Autumn 2019*

*Cornelia Andersson*

**Supervisor:** Karen Ann Blom  
**Examiner:** Annika Denke
Title: How Digital Tools are Used and Perceived by Students with Dyslexia and Teachers within the Swedish Classroom

Author: Cornelia Andersson

Abstract
The aim of this study is to examine how digital tools are used and perceived by students with dyslexia and their teachers within a number of English classrooms in the Swedish upper and lower secondary school. The study is based on five interviews. Two of the interviews were conducted with students from upper secondary school and three with teachers from lower and upper secondary school. The background section defines and describe terms such as dyslexia, ADD/ADHD and digital tools that are helpful for students with dyslexia. The method chosen for this paper is qualitative. The conclusion of this research paper is that the students’ and teachers’ perceptions of digital tools are mostly positive and that they find them helpful when it comes to coping with dyslexia.

Key Words
Dyslexia, ADD/ADHD, Difficulties, Digital Tools, Technology

Number of Pages: 16
# Table of Contents

1. Introduction .................................................................................................................. 1

2. Aim and Research Questions ....................................................................................... 2

3. Background ..................................................................................................................... 2

   3.1 What is dyslexia? ......................................................................................................... 2

   3.2 Dyslexia and motivation ............................................................................................ 3

   3.3 What is ADD/ADHD? ................................................................................................. 4

   3.4 The Swedish National Agency of Education’s inclusion of digital tools ..................... 5

   3.5 What tools can be helpful for students with dyslexia? .............................................. 5

4. Method of Study ............................................................................................................ 8

   4.1 Interviews .................................................................................................................. 8

   4.2 Material .................................................................................................................... 8

5. Results and Analysis .................................................................................................... 8

   5.1 Results from the interviews with the students ............................................................ 9

   5.1.1 The digital tools the students use ........................................................................... 9

   5.1.2 Teachers’ encouragement and students’ motivation .............................................. 9

   5.1.3 Disadvantages with digital tools .......................................................................... 10

   5.2 Results from the interviews with the teachers .......................................................... 10

   5.2.1 The digital tools the teachers use together with their students .............................. 10

   5.2.2 Teachers’ perspectives on digital tools’ impact on their students’ motivation ......... 11

   5.2.3 Teachers’ perceptions of their students’ development connected to digital tools .... 12

   5.2.4 Positive and negative sides of digital tools, according to teachers ....................... 13

   5.2.5 Teachers’ perceptions of their students’ attitudes towards digital tools ................. 13

5.3 Analysis of results and conclusion ............................................................................. 14

6. References ...................................................................................................................... 16

Appendices ......................................................................................................................... 19
1. Introduction

There is a wide variety within the category of digital tools, such as computers and tablets. The question is how do students with dyslexia and their teachers perceive and use them? Oxford dictionaries (2018) describe a tool as “a thing used to help perform a job”, so, how can these digital “helping” agents (tools) support educators who are faced with a substantial number of students with reading and writing difficulties in the classroom? Dyslexia Institute UK (2018) reports that around 5-15% of the Swedish population has some kind of reading and writing difficulty. While reading and writing difficulties may include a wider range of neurological and other physical difficulties, this paper focus mainly on dyslexia. Dyslexia is a variety of a reading and writing difficulty that is a brain-based condition (Gillis, 2017, 0:09). While interviewing the students for this essay the diagnoses dyslexia and ADD were discussed, since these are the two diagnoses the students have. However, both dyslexia and reading and writing difficulties that are similar to dyslexia were discussed with the teachers that were interviewed. Since the teachers teach a number of students who have different learning difficulties. A large number of digital tools are developed specifically to help students with difficulties. This study will look into different tools that teachers and students use, how they use them and their perceptions of the tools.

This essay begins with the aim and research questions. This is followed by the background section, method section, results and lastly the analysis and conclusion.
2. Aim and Research Questions

The aim of this study is to examine how students with dyslexia and teachers who teach students with dyslexia and other reading and writing difficulties perceive digital tools and how the digital tools are used. The following research questions will be examined:

1. How are digital tools used by students with dyslexia and their teachers within a number of English classrooms in Swedish lower and upper-secondary school?
2. How do students with dyslexia and their teachers perceive digital tools?

3. Background

To start off this essay the term dyslexia will be defined. This will be followed by describing dyslexia and motivation, ADD/ADHD, The Swedish National Agency of Education’s inclusion of digital tools finally there will be an overview of what kind of tools that can be helpful for students with dyslexia.

3.1 What is dyslexia?
Dyslexia is the most common type of reading and writing difficulty. Between 5 and 17.5% of the world’s population have it (Cutting, Vue et al, 2013, p.199). It is important to talk about the prejudice that people have regarding dyslexia. Someone who has dyslexia is not less intelligent than any other person. Dyslexia is a brain-based condition, and studies of brain images have shown that there is a difference in how the brain is structured and functions for people with dyslexia compared to people without dyslexia (Gillis, 2017, 0:09). Signs of dyslexia can be seen before children learn how to read and write. For example, it can be hard for children with dyslexia to hear the difference between different syllables or to decode 1 (Gillis, 2017, 0:53). Students with dyslexia experience reading differently from students without dyslexia. Reading an article or book can look like this:

1 When a person is not able to decode, they struggle with producing the sound correspondence to the printed letter (Samuels, 1988, p. 756).
Another description of what dyslexia can feel like is that reading is comparable to trying to read what someone has written in the sand but before they get the chance to read, the waves wash away parts of the word (Cederquist, 2016, 2:26). In order to be able to read, a person with dyslexia needs to break down each word into different parts to understand its meaning. People with dyslexia might also spell words as they hear them, for example, “goin” for “going”, “bok” for “book” (TED-ed, 1:25, 2013). There are different “levels” of dyslexia, ranging from a mild to a more extreme version of it, and one out of five people are diagnosed as being dyslexic.

People with dyslexia can learn how to decode and eventually alleviate some parts of their dyslexia and thus, improve their reading skills (TED-ed, 3:20, 2013). Cruger (8:18, 2017) describes that students with dyslexia often have phonological problems and “their experience is often sort of tip of the tongue phenomenon. They know the word, they know that it’s there, but they can’t easily retrieve it” (Cruger, 2017, 8:26). This can cause fluency problems for the students. A student with dyslexia can also lack general knowledge, not because of their intelligence but because they do not gather as much information as a “standard reader” (Cruger, 18:01, 2017). These students do not often receive as much information as standard readers due to the fact that they are handed easier books with less information, easier vocabulary etc.

3.2 Dyslexia and motivation

Csizér, Kormos and Sarkadi (2010, p.471) state that when students learn a foreign language, they are most likely to encounter problems. The problems can be lacking linguistic skills, such as word recognition or spelling. These negative experiences with failure can make the students lose motivation to learn a foreign language. Lodygowska, Chęć and Samochowiec (2016, p. 575) claim that children with dyslexia tend to experience failure early during their
education. Academic performance is not at the same level as it might be for other students when it comes to reading and writing. Due to the students’ experience with failure in school, they often identify school with failure and anxiety. Because of this, the students may start to doubt their ability to learn and this might affect their motivation in school (Lodygowska, Chęć and Samochowiec, 2016, p. 576). Children who have dyslexia can face a vast amount of these problems, especially when learning a foreign language (Csizér, Kormos, Sarkadi, 2010, p.471). Ventura (2017, p.1) reports that different technological tools have been proven to be efficient to students with dyslexia in terms of enhancing their motivation. So why and how is motivation important for learning? Csizér and Zoltán (2005, p.616) explain that it is accepted universally that motivation plays a huge role when it comes to academic performance in general, especially for L2 learners. Oxford and Shearin (1994, p. 12) argue that motivation influences students in a number of ways:

[…] motivation directly influences how often students use L2 learning strategies, how much students interact with native speakers, how much input they receive in the language being learned (the target language), how well they do on curriculum-related achievement tests, how high their general proficiency level becomes, and how long they persevere and maintain L2 skills after language study is over […]. Therefore, motivation is extremely important for L2 learning, and it is crucial to understand what our students’ motivations are.

Students who are facing obstacles with reading and writing might be open for more intake if one as a teacher finds the right tool to motivate the student with.

3.3 What is ADD/ADHD?
The following section was elaborated to explain one of the interviewed student’s ADD diagnosis. ADD stands for “attention deficit disorder”. ADHD is the same diagnosis as ADD but stands for “attention deficit hyperactivity disorder. It includes the symptom of physical hyperactivity (Oxford Dictionaries, 2019). As of 2011, the Centers for Disease Control and Prevention reported that 11% of children aged 4 – 17 of the world’s population had the diagnosis ADHD (Mahamne, 2015, 1:11). ADHD/ADD used to be considered as a behavior problem. Researchers have now found it to be more of an attention problem that is located in the brain management system (Brown, 2016, 0:47). Just as with dyslexia, ADD or ADHD have nothing to do with how intelligent a person is. You can have any IQ, high or low, and still have ADHD or ADD. Some of the problems that people with ADD/ADHD have are that they find it challenging to stay focused while reading, listening or producing any type of
work. Brown describes it as “[…] similar in a way to the problem you are having with a cellphone when you are in an area where you don’t have a good reception. You get a part of it but then the message keeps fading in and out” (2016, 2:41). People with ADD/ADHD are also easily distracted. They have a hard time focusing on what is going on in the present time, and their minds can easily wander someplace else (Brown, 2016, 3:20). For some students, the hardest part can be organizing their belongings, e.g. difficulties with finding their backpack or computer (Brown, 2016, 8:42).

3.4 The Swedish National Agency of Education’s inclusion of digital tools
Teaching with digital tools is more common in Swedish schools today compared to earlier. The National Agency for Education in Sweden (Skolverket, 2017) changed the steering documents in 2018 by adding that digital competence means that every student is expected to know how to use and understand the concept of digital tools. This change was made to develop an understanding among students of how digital tools impact society. This new part in the steering documents creates an opportunity for the students and teachers to use digital tools more by encouraging them to do so. If educators want students to use digital tools more, it is essential that they themselves use them in the best possible way for the best possible educational outcomes. The best way and the best educational outcome will probably be different for every student. The National Agency for Education in Sweden (Skolverket, 2019) claims that the school has a central role in helping every student benefit from digitalization. Students use digital tools more today at home and this is one reason why it is important that teachers themselves are able to use the tools as well as understand when to use them to benefit the students (Skolverket, 2019). In the English classroom, one has the opportunity to use several kinds of different tools, some of these will be presented in the next section.

3.5 What tools can be helpful for students with dyslexia?
Different teachers use different tools for their students with reading and writing difficulties, such as dyslexia. Biancarosa and Griffiths (2012, p.140) explain that technology like Kindle (electronic reading tablet) and iPads have created high hopes among many teachers who believe that digital tools can be great instructional tools for literacy education. The authors state: “Simple applications of existing e-reading technology such as changing font size on-screen, using text-to-speech features to provide dual input of text, or using the Internet to collaborate on learning activities may substantially improve the learning of many students” (Biancarosa and Griffiths 2012, p.140).
Poss (2017a, 0:32) explains that students who face challenges with communication are never too young to start using technological tools. Poss also states that, in this modern age, digital tools are more accessible considering that they do not cost as much as they did 10-20 years ago (2017b, 0:54). One tool that Poss (2017b, 0:13) describes as helpful to students with reading and writing difficulties is the text-to-speech tool. This tool enables one to take any type of digital text and then listen to it with a synthesized voice. This gives the students with reading and writing difficulties a chance to understand a text they have not earlier grasped (Poss, 2017b, 1:00). Poss also expresses the importance of allowing teachers the opportunity to learn about the digital tools that are helpful to students with reading and writing difficulties (2017b, 2:08). It is even more important to teach the students how to use the tools. Educators need to teach the students how to use them so well that they do not need to rely on the teachers when they use them (Poss 2017b, 2:30). Students nowadays live in a digital world. This makes digital tools a part of their everyday environment for most of them and because of this they are more likely to understand and manage digital tools without a problem (Poss, 2017b, 2:40).

Speech-to-text is another tool that is effective for students with reading and writing difficulties. Using speech-to-text can make writing a lot easier. The purpose of this tool is to help students when they are facing obstacles with spelling or the physical act of writing (Poss, 2017c, 0:36). Speech-to-text helps students who are struggling to produce writing on a higher level than they might at other times (Poss, 2017c, 1:07).

A problem that can occur is when students (especially younger ones) do not want to look any different from their classmates by being supplied with a tool (Poss, 2017d, 0:28). Poss explains that “[…] if a teacher said every day when kids came in to their writing activity, “would you like to write on the tablet? […] would you like to write with pencil and paper?” then every student could pick the tool that best meets their needs” (2017d, 0:50). By using tools like speech-to-text and text-to-speech the student is not as dependent on a teacher as they are if they are using for example a scribe (Poss, 2017e, 1:02).

Dawson, Antonenko, Lane and Zhu explain that there are more and more digital tools developed each year (2018, p.234). One example of such a digital tool is the text-to-speech tool, which can transform a book’s content from print to audio. This tool enables students
with dyslexia to access the printed text (2018, p.227). The text-to-speech tool can be useful for students with dyslexia who are facing problems with decoding, fluency and listening comprehension skills. The authors also claim that “AT (assistant tools) can also support students with dyslexia by providing options for interacting with and customizing text display. Devices such as e-readers can improve reading comprehension and reading speed when text is presented in shorter lines with more spacing and when key points are highlighted within on-screen text” (Dawson, Antonenko, Lane and Zhu, 2018 p.227). When it comes to writing, programs like “Word” that has a spell checker can be helpful for students with dyslexia, since they make it possible for them to improve their spelling, organize their writing as well as structure and gain confidence in their writing. Research has found that digital tools can alleviate challenges that the students with dyslexia associate with reading, writing and spelling (Dawson, Antonenko, Lane and Zhu, 2018 p.228). The authors present a table that summaries how different digital tools can help students with dyslexia:

<table>
<thead>
<tr>
<th>Challenge for students with dyslexia</th>
<th>How AT might support</th>
<th>Read&amp;Write features to support the challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>Options for accessing information</td>
<td>The Text-to-Speech feature allows users to listen to content while looking at it on the screen</td>
</tr>
<tr>
<td>Writing and spelling</td>
<td>Options for expressing thoughts and knowledge</td>
<td>The Screenshot feature allows users to listen to the words within images, graphs and screenshots.</td>
</tr>
<tr>
<td></td>
<td>Options to support spelling</td>
<td>The Simplify feature strips away extraneous material so learners can focus on the content of a page.</td>
</tr>
</tbody>
</table>

The background section has demonstrated information and terms regarding digital tools and reading and writing difficulties this to help the reader understand why they are important for this subject.
4. Method of Study

The chosen method for this essay is qualitative. A qualitative research is used to answer questions and research about meaning, experience and perspective from the standpoints of participants (Hammarberg, Kirkman & Lacey, 2016, p.499). The participants of this study are three teachers and two students who were interviewed regarding their experiences and perceptions of digital tools and reading and writing difficulties. The interview questions can be found in the appendices.

4.1 Interviews
The researched area can be sensitive to talk about for some students, due to the fact that they may have experienced uncomfortable situations connected to their difficulties. Before the interviews, the students and teachers were asked if they still wanted to participate and were informed that they could change their minds at any time. The perspectives of both teachers and students are important for the research to be authentic. Greene & Hogan (2005, p.12) state that we have a lot to learn about children from children when it comes to doing research. It would be easy only to interview teachers with years of experience on the subject, but having the students (who are the ones experiencing the difficulties) share their thoughts is important for the study.

The questions asked during the interview were presented to the students a couple of days before the interviews were held. This was decided considering that the students might be more comfortable participating in the interview if the questions were presented beforehand. This way, the students were also able to prepare their answers. The teachers were presented with their questions during the interview.

4.2 Material
11 of the sources in this essay are visual sources since the topic of the essay concerns students with dyslexia and by using visual sources the study is more accessible to the participants of the study and other people who have been diagnosed with dyslexia. Visual sources can make the sources more accessible for students with learning difficulties like dyslexia since they are able to listen to them instead of reading.

5. Results and Analysis
5.1 Results from the interviews with the students
Two students were interviewed. One male, who in this research paper will be called “Jonas” and one female who will be called “Jessica”. Both students have dyslexia. Jonas also has ADD.

5.1.1 The digital tools the students use
When asked what digital tools the students use in the English classroom, as well as how they use them, Jonas answered that he mostly uses the computer as hardware. When it comes to software, Jonas uses the CD that comes with his textbook in English – a reading service which reads to him. This works very well for Jonas, due to the fact that he can choose different speeds, pause and rewind. Jonas also uses “Grammarly”, which is a spell and grammar check program. He believes that Grammarly helps him understand how to correctly spell the word he misspelt for the next time. Jessica explained that her English teacher is very old fashioned and that he likes to use analogue tools rather than digital tools. In other subjects, she uses her computer and the spelling program that one can find in “Word”.

5.1.2 Teachers’ encouragement and students’ motivation
When asked if their teachers encourage them to use digital tools in the English classroom, Jonas agreed partly. Jonas stated that his teacher advises him to use a reading service if he feels that he cannot keep up the speed. Jonas explained that he would appreciate if the teacher brought some new ideas of digital tools to use so that he can improve his English even more. According to Jessica, her English teacher has never encouraged her to use digital tools or asked her if she needs them to help her with her difficulties.

When asked if the digital tools increase or reduce their motivation for school, the students’ answers were very different. Jonas answered that the digital tools definitely increase his motivation. Since he has ADD, he does not only like the way they develop his reading and writing difficulties, but also the fact that the tools can easily help him find his schoolwork considering that he has it all in his computer. Jonas feels that when he has a lot of textbooks etc., it is harder for him to start working and concentrate. Jonas explained that it is easier to learn with digital tools, and when it is easier, it also becomes more enjoyable. Without digital tools, Jonas feels that it would be harder to concentrate and to process everything he has to learn. Jessica, on the other hand, does not feel that digital tools motivate her. She considers herself as a non-technical person. She prefers the traditional way with pen and paper.
5.1.3 Disadvantages with digital tools
When asked if there are any disadvantages with digital tools, both students answered with conviction that: when the technology does not work. Jonas described that when the technology does not work it usually takes a lot of time away from the lesson and can sometimes interrupt his “flow”. It is usually the computer that does not work or needs an update. Generally, Jonas is very positive to digital tools and also professes his thankfulness for them. “I am very thankful that they exist. Some students have a hard time getting through school without digital tools”. Jessica also stated that when the technology does not work, it is frustrating.

5.2 Results from the interviews with the teachers
Three teachers were interviewed. In the research paper, they will be called “teacher 1” (T1, graduated in 2011, teaches English, Spanish and Swedish), “teacher 2” (T2, graduated in 2008, teaches English, Spanish and Swedish) and “teacher 3” (T3, graduated in 2010, teaches English and Swedish). T1 and T2 work at a lower secondary school in Jönköping County. T3 works at an upper secondary school in Jönköping County that has vocationally oriented programs. All teachers interviewed teach at least two subjects, but this interview focused on their experience with students who have reading and writing difficulties in the English classroom.

5.2.1 The digital tools the teachers use together with their students.
When asked what digital tools the teachers use when teaching English and how they use them, T1 answered that she uses computers, iPads and Clevertouch (a Clevertouch is a large touchscreen that can be used instead of a whiteboard, and that is also connected to the internet). The software T1 uses is one-note (a program for taking notes), NE (online encyclopedia) and ClaroRead (reading assistant). One-note is used for taking notes and can also read what the student writes (in a robotic voice) back to the student, so that they can hear if the writing is correct. NE is used to access information quickly. ClaroRead is used to read texts in a very natural voice and can be used for both websites and PDFs. One can choose what speed it reads at, and the students can highlight important parts for it to re-read. Within ClaroRead there is another product called ClaroSpeak, in which the student can record their own voice whereupon ClaroSpeaks transcribes it. T1 also uses the book “Ready, Steady, Go!”, which is a textbook for students with reading and writing difficulties. “Ready, Steady,
Go!” also has a website with exercises. T1 also uses a “reading ruler”, which is a ruler that you use to separate a text part by part, so that it is easier to focus and read (as a non-digital tool).

T2 uses a lot of non-digital tools, such as the traditional pen and paper, textbooks and novels. The digital hardware T2 uses is computers and iPads. The software used is PowerPoint, “Readtheory” (a website that has texts with reading activities), “Kahoot!” (an online game), Padlet (an online screen that both teachers and students can post on) and “WebTools online” (an online tool where you can randomize names, groups or have a virtual hand-raising tool.)

T3 uses computers as hardware (each student has their own computer) and cellphones. The software T3 uses is Legimus (a reading assistant). T3 also described that students with ADD/ADHD use the reading assistant to be able to concentrate better.

5.2.2 Teachers’ perspectives on digital tools’ impact on their students’ motivation
T1 believes that it is easier to motivate students while using digital tools considering that they are already used to the technological world. T1 also motivates her use of digital tools with “approaching their everyday reality”. T1 believes that it is easier when the students feel comfortable, which she believes they are when learning via digital tools. When asked if they have an introduction to digital tools for 7th grade students (with reading and writing difficulties) T1 answered yes, but with the “special needs educator”. The special needs educator gives an introduction to the digital tools that the school offers. The school started the “one-to-one” program this fall, so now every student who has a computer will also be offered the special education software.

T2 believes it is easier to motivate students with digital tools because of the variation they bring compared to when using only non-digital tools. T2 does not believe that digital tools motivate students because it is easier to use them, but because it makes the classes more varied. T2 also explains that the technology the school uses does not always wor. This makes the students resent it.

T3 thinks it depends on the student (if they become motivated or not), and that educators should customize the education to each student in every way possible. T3 also believes in
variation and the combination of both digital and non-digital tools. The teacher also tries to let the students choose for themselves whether they want to use digital or non-digital tools.

5.2.3 Teachers’ perceptions of their students’ development connected to digital tools

When asked if digital tools help students’ development (especially for students with reading and writing difficulties) T1 answered that she does not believe that it is digital tools that help the students develop. T1 believes that the difference between a student that develops their skills faster compared to students who do not is their inner motivation. T1 does not believe it is the computer (or digital tool generally) that is the reason for students’ development. What T1 believes is different now, compared to 20 years ago, is that the technological tools are more effective.

T2 believes that society might give a bit too much credit and trust to the digital tools for a student’s development. He believes that digital tools help with organizing texts (e.g. to move parts of the text instead of starting fresh, as one has to do if the text is written on a paper). On the other hand, he believes that programs like “ReadTheory”, which can navigate what level the student has in reading and writing, can be helpful for the students (especially students with reading and writing difficulties like dyslexia) to move forward with their studies. T2 also described that his experience is that his students have a harder time working with long texts in Swedish rather than in English and that they are more motivated to use digital tools in Swedish.

T3 believes that, if used correctly, (and especially for the students with difficulties) digital tools are beneficial. T3 uses a student as an example. The student has a very hard time writing, but his memory on the other hand is great. When doing an assignment orally the student has no problem at all to tell the teacher the right answer. T3 described that she usually priorities oral assignments so that he gets a chance to show his knowledge. The student practices his writing as well. T3 believes that digital tools are crucial for the students who need them (students who face difficulties in reading and writing), but that it does not do the job for them. The students must be able to use the tools correctly. Just because the students are handed digital tools, it does not mean that they will automatically work with them. Monitoring is also crucial for the digital tools to be effective considering that the students are easily distracted.
5.2.4 Positive and negative sides of digital tools, according to teachers
T1 explained that her experience with the positive sides of digital tools is that, as a teacher, one can customize the lesson for each student with digital tools. Digital tools also speed up the pace of the lesson, so that the students do not get the feeling that the English classes are boring or slow. On the other hand, the negative side is that you need to monitor students more closely. When students only have a pen and a paper, you can easily see if they are not working, but if they have a computer, they can do whatever they want if the teacher does not monitor them. T1 said that if the students have time to spend on non-schoolwork, the teacher needs to reassess their timing and level of difficulty in order to keep the class’ attention. It is essential to check why the students get distracted. Are the assignments too easy, too hard?

T2 said that the positive sides of digital tools are that (especially for students with reading and writing difficulties) the process of reading and working with texts is far easier. T2 appreciates the fact that they have access to current articles, texts and news. On the negative side, T2 explains that as long as the digital tools work as they should, there are not really any downsides to use them. However, it is important to remember that the work still needs to be done by the students.

T3 said that generally digital tools are great because of the information the internet holds. She works a lot with fact-checking as well. T3 feels that the opportunities and variation digital tools provide make teaching and learning more accessible and fun. T3 explained that there has been a discussion around platforms such as YouTube being only for entertainment, but she believes that it is excellent as an educational tool as well. The negative side to digital tools, according to T3, is that they can be a huge distraction. This can be extra difficult for students with ADD or ADHD.

5.2.5 Teachers’ perceptions of their students’ attitudes towards digital tools
T1 explained that there is not a “wow-reaction” from the students when she brings iPads or computers to the classroom, but the students do prefer to use the computers over the iPads. Her students appreciate variation but can work with both digital and non-digital tools. For the students in 7th grade (who are in the one-to-one program), T1 has decided (together with the students) that they are mainly going to use the computers and digital tools from now on instead of the textbook. T2 says that his students’ attitudes toward digital tools are mainly positive, as long as they function properly. If they do function properly, the students have no
problem using digital tools. T3, similar to T1, describes that there is no “wow-reaction” but that the students with reading and writing difficulties appreciate digital tools a lot.

5.3 Analysis of results and conclusion

To conclude this essay, the findings will be summarized, analyzed and concluded in this section. Both the students’ and the teacher’s perceptions and use of tools will be discussed.

While the students use a few or no digital tools at all, the teachers interviewed find a number of tools helpful for students with dyslexia or other learning difficulties. However, what both the students and teachers have in common is their use of the reading assistant. This seems to be the tool that is most helpful. Poss (2017b, 1:00) explains that the text-to-speech tool (also known as a reading assistant) gives the students with reading and writing difficulties (such as dyslexia) a chance to understand a text that they might not be able to understand if they read on their own. Both the teachers and the students interviewed see the speech-to-text tool as a tool that gives the students a chance of understanding a text better. Since the interviewees in this essay use the tool text-to-speech frequently, one might conclude that the interviewees perceive the tool as something that makes the learning process more accessible for the students with reading and writing difficulties by supporting them in the reading process. Most of the tools discussed in the interviews are used to facilitate the physical act of writing and reading and to create an efficient learning process for the students with dyslexia. Even though not all students with dyslexia might feel the need to use digital tools to improve their skills in English reading and writing, they can be helpful to use. The two students who were interviewed had different perceptions of digital tools. While Jonas believes that digital tools help him improve his English, Jessica is not as convinced. Jessica feels that she is able to “control” her dyslexia today and expresses that it does not feel like it makes her struggle as much as it used to. Based on the two interviews one can assume that even though a student has struggled with reading and writing because of their dyslexia, they might find ways to manage it. As stated in the background section, one can learn to, for example, decode and alleviate some aspects of their dyslexia (TED-ed, 3:20, 2013). Digital tools can also be a reason to why a student does not struggle as much with their dyslexia as they used to. Cruger (2017, 8:26) explains that a student with dyslexia can lack general knowledge because they cannot access it in the same way as a “standard reader”, but with help from digital tools students with dyslexia might be able to “catch up” on the standard readers, as for example
Jonas expresses that he has. T3 also expresses that digital tools, such as the computer or iPad, are helpful for students to get access to the web and widen their knowledge.

As explained in the background section, Lodygowska, Chęć and Samochowiec (2016, p.575) state that students who are diagnosed with dyslexia often experience failure early in school. This failure might create anxiety and lower their motivation. Students’ and teachers’ perceptions of digital tools’ impact on motivation differ. Jonas thinks that digital tools motivates him by developing his skills in English as well as motivating him to stay organized despite his ADD. Jonas has experienced that material such as text books can make him lose focus. This does not happen as easily when he uses digital tools. It is also easier to access his assignments so that he can start each lesson faster when using digital tools. Brown (2016,8:42) explains that students with ADD might have a hard time focusing and organizing. This might indicate why Jonas benefits from digital tools to a wider extent in comparison with Jessica, due to the fact that they also assist him with his ADD and not only his dyslexia. The teachers state that digital tools are motivational for the students by creating variation, are comfortable for the students to use and are a step into their everyday reality. T1 does not believe that it is the digital tools per se that help students with dyslexia to develop. It is the inner motivation of the students. So, this might infer that motivation is a factor that benefits learning for students with dyslexia. One can conclude that digital tools make the learning more accessible for the students and therefore they might motivate them to learn. The teacher’s perceptions of the digital tools vary. While T2 believes that society might give them too much credit and trust, T3 believes they are crucial for students with reading and writing difficulties such as dyslexia. However, each teacher has positive things to say about digital tools and their impact on learning for students with reading and writing difficulties. T1 explains that she appreciates that digital tools give her the opportunity to customize each lesson for each student.

In conclusion, one can conclude that the majority of the participants are positive towards digital tools. Digital tools are used to make students with dyslexia and other learning difficulties more independent in their learning. They can be helpful for students with dyslexia by acting as an extra guidance while reading and writing and alleviate some of the challenges the students associate with reading, writing and spelling. Digital tools can also be motivational for struggling readers and writers since they make the learning more accessible. As stressed in previous research, teachers in secondary and upper secondary school need to
take into account the importance of digital tools for students with dyslexia and use them in the correct way for the best educational outcome.

6. References


Mahamane, S. (2015). *ADHD sucks, but not really*. Retrieved from: [https://www.youtube.com/watch?v=fWCocjh5aK0](https://www.youtube.com/watch?v=fWCocjh5aK0)


Poss, B. (2017c, December). *Speech-to-text for struggling writers*. Retrieved from: [https://www.youtube.com/watch?v=ktyD8Nu9sSM](https://www.youtube.com/watch?v=ktyD8Nu9sSM)


Appendices
Questions for students

What digital tools do you use during English lessons? Also, which non-digital tools do you use? (How do you use them?)

In what way do these digital tools help you with your education?

Is there a difference in how much digital- and non-digital tools help you in your education?

Does your teacher encourage you to use digital tools to help you during class? If so, how and what tools does he or she encourage you to use? If not, what makes you feel this way?

Do you feel like digital tools help you to increase or prevent your motivation for school? Please, motivate your answer.

Are there any downsides to working with digital tools?

Questions for teachers

What digital and non-digital tools do you use during your classes?

What digital tools do you use in class to help students with reading and writing difficulties?

What is your method with these tools?

Do you feel like it is easier to motivate students to learn with digital tools? Please motivate your answer.

Please explain how you feel that digital tools may have impacted your student’s development.

What is positive and negative with digital tools in teaching in general, as well as in teaching students with reading and writing difficulties?

How do you experience that students’ attitudes are towards digital tools?

Do you work with digital tools more nowadays compared to a couple of years ago? Why or why not? What would encourage you to use more digital tools in your classroom?