Degree Thesis 1

Level: Bachelor's
ICT as a tool in English teaching

A literature review on the use of ICT for Swedish students with learning difficulties and their literacy learning in grades 7-9

Author: Ebba Kjellin Ifverson
Supervisor: Marcia Markus
Examiner: David Gray
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Abstract

Information and communication technology (ICT) is a subject that is being discussed as a tool that is used within education around the world. Furthermore it can be seen as a tool for teachers to individualize students´ education. Students with literacy difficulties, such as dyslexia, are in constant need of new ways to learn, and new ways to be motivated to learn. The aim of this study is to see what research says in regard to how ICT can be used as a tool to help students with literacy difficulties. Literacy difficulties can be due to a number of things, such as the student has not been taught how to read, trouble within the family which can cause distress, or a neurological disorder such as dyslexia. Furthermore, the main research questions will focus on how ICT can be compared to traditional education forms, such as books and a more teacher centered education within the classroom, and whether ICT can be preferred. The results of this literature review indicates that ICT can be seen as a way for teachers to help students with literacy difficulties gain more self-esteem – something the literature tells us students with learning difficulties lack. The results also show how ICT can lead to a more individualized education. This is due to tools that increase reading comprehension and tools that give direct response when working with ICT, which helps students work more independently.

Keywords: ICT, education, literacy difficulties, dyslexia.

1. Introduction

Most students learn to read and write within the first year of school, and some children already have the basic knowledge of letters and numbers before entering the Swedish school system. However, there are some children who lack this basic knowledge due to reading difficulties or neurological disorders such as dyslexia. They can also have emotional and family problems which can cause emotional stress, and this can lead to reading issues. Not being able to read and write in today´s society causes a major handicap for those who are affected, and this can also be very stressful. Students who have reading difficulties have a hard time developing in all subjects in school and this can lead to low self-esteem, which in turn can lead to further deterioration in students' overall performance in school (Ericson, 2010 p. 91). All students should be able to go to school and feel like they can achieve their goals. Therefore different resources need to be available and applied to give students with literacy difficulties good support.

Today there is a wide range of technology to promote student learning and skills development in schools around Sweden. In particular, technical support provides an opportunity to develop and increase literacy skills for students who have difficulties with their literacy learning (Brodin, 2010). It is important that schools, teachers and students are encouraged to make use of the technology available. Not only because it is a way to get support whilst reading, but because of the social developments within our society where computers and other resources are a big part of daily life. Students engage with technology when they play video games, use social media, when they search the internet, or download movies. This knowledge of technology can be used in educational purposes, and social media can open up room for conversations in group chats or instant messaging. In addition ICT can make it possible for students with literacy difficulties to feel more included in the education that is provided, and the use of ICT can also enable a more individualized education. This would help the pupils reach the educational needs and goals that are set in the Swedish curriculums (Brodin, 2010).

ICT and learning to read are highly compatible, and ICT, especially technology itself, has traditionally been used as a tool to help children to learn to read, and also to learn languages (Svensson, 2008, p 9). Reading, learning languages and ICT have two common cores, which can make ICT a beneficial tool to be used within reading and language learning. Firstly,

Svensson (2008), states that languages and ICT are foremost connected in the way that they both are based on communication. Secondly, they all rely on a sense of understanding. When learning to read or learning a language the student needs to understand to develop. When using ICT the student also needs to understand how to use the device to be able to benefit of what ICT can offer, therefore they have a common core of understanding. Furthermore, ICT can be used as a tool for students to feel included and to feel that they are able to achieve, something that is very important for students with literacy difficulties (Svensson, 2008, p 26).

1.1 Aim of study and research questions

The aim of this study is to investigate what the existing research says about how the use of ICT can increase literacy learning in English for students with reading difficulties, in grades 7 – 9, in Swedish schools. To achieve the aim of this thesis, the following research questions will be applied:

• What does the research say about how the use of ICT in education can positively affect the literacy learning in English for students with reading difficulties?

• What does the research say about the didactic benefits of ICT in relation to traditional English teaching, such as books and a more teacher centered education?

Literacy difficulties amongst pupils can have a number of explanations, though not all of these will be covered in this study. These could for example be: little experience when it comes to reading or learning a new language, and difficulties when it comes to concentration. However, this degree thesis will examine what the existing research says about emotional difficulties or neurological disorders such as dyslexia in relation to literacy difficulties.

2. Background

This thesis will focus on students in Sweden with literacy difficulties who are studying English as a second language. This is why the background on reading and writing difficulties discusses the Swedish language and not languages worldwide.

2.1 Reading and writing difficulties in Sweden

Reading and writing difficulties within the Swedish language were discovered and diagnosed during the late 19th century and were defined as acquired dyslexia (Ericson, 2010 p.25). During this time it was thought that reading and writing difficulties were something that children were born with, and that it was a form of brain damage. Students with this condition were forced to retake their school years many times, which led to many students never finishing school. This understanding of dyslexia went on for some years, but in 1938 the government in Sweden decided that classes were to be started in Stockholm in an effort to help students with literacy difficulties. During this time researchers said that not being able to read could be caused by numerous things, such as limited learning ability, conflicts between brain tendencies, poor perception, poor health / environment, and poor schooling (Ericson, 2010 p.25).

Between the 1950s and 1970s, the Swedish government introduced some general and mandatory reading tests for all students starting school. This was to discover early on whether students had reading difficulties, in the hope to be able to better help these children to develop their reading ability. It was also during the 1970s that reading difficulties were blamed on the school establishment itself. It was said that if the teachers and decision makers in schools had been doing their job right the students would not have the need for extra support (Ericson, p.28). This theory was soon denied, which led to students with reading difficulties being examined and then given a diagnosis. The children with a diagnosis were then put in a special class where they received the extra support they needed. In time these students were included in the classroom, and received extra support within the classroom. The extra support was in terms of individualized teaching, and it was between 1950s and 1970s that the phenomena of dyslexia was further researched and explored (Ericson, 2010 p. 29).

The research and the findings that were made during the late 20th century resulted in more understanding of literacy difficulties, which can be applied in current time. Students with

literacy learning difficulties are not just struggling to read, they also often find it hard to focus and to stay positive. It is every school's assignment to make sure that students are encouraged and that their best interests, in terms of learning opportunities, are achieved. This has to be done in a way that includes a good environment for the students to learn in. It has to be an environment that awakens the students' urge and curiosity to learn. Students with literacy learning difficulties also need to be seen, heard, and to be reassured of their development (Skolverket, 2008 pp. 8-9.) It is very important for students to feel good about themselves in order to succeed and develop. If a child has trouble reading, all other subjects at school are likely to be compromised, which may lead to low self-esteem, and a feeling that the student is not able to achieve. To practice literacy learning there are many strategies, but first and foremost students need to practice their skills to learn in general. These strategies can be defined as: intelligibility, manageability and meaningfulness (Glentow, 2006 pp. 16-18). Intelligibility is when the student understands their role and what is expected of them, whereas manageability is when the student has enough time for doing what is expected, and time to get the help they need. Meaningfulness then is when the students feel part of a group and that their work is worth the effort. (Glentow, 2006 pp. 16-18).

Intelligibility, manageability and meaningfulness in regard to literacy learning can be seen in the curriculum for English learning written by the Swedish national agency for education. They write that:

Education must be tailored to each student's abilities and needs. It shall promote pupils' continued learning and knowledge based on students' background, previous experiences, language and knowledge (Authors translation from Skolverket, 2011 p. 8).

The school and teachers have a responsibility to teach and to increase students´ knowledge. To do this they need to ensure that every students´ educational needs are met and that they can develop at their own abilities. The Swedish national agency for education also indicates that:

The students' different abilities and needs should be taken into account. There are also different ways to reach the educational goals students set out for themselves. The school has a special responsibility for those pupils who, for various reasons, have difficulty reaching their educational goals. Therefore, education can never be performed in the way same for everyone (Authors translation from Skolverket, 2011 p.8).

Furthermore in *Comments of the material in the fields of English* (Authors translation of Skolverket, 2011) it states that:

> When students receive training in how to use media as a tool in English language learning, they also gain access to a stream of language and expressions that they can process and assimilate. They may also, through this media, find a way to express themselves in a creative way (Author's translation from Skolverket, 2011 p.10).

ICT within English education can, as mentioned above, be a great way to integrate the English language on a motivational and creative level, and can therefore be seen as a tool worth using.

Each student should be able to reach their goals and to do this there are various technical devices that teachers can use in the classroom to make the education more individualized. These are mainly tablets and computers, which teachers can use, for example, to download language apps, which can be used for educational purposes. The apps can be customized to student´s individual needs to give a better opportunity for literacy development. However, in 2012 the Swedish government did surveys on how much ICT such as tablets, computers and apps are used within schools and what the benefits were (Skolinspektionen, 2012). They were concerned that teachers do not have the qualifications or the equipment needed to fully realize the advantages that ICT can give. The students who took part in the surveys said that computers were only used to write texts and to search the internet for information within specific areas. This use of computers does seem limited and is possibly a waste of recourses. The surveys found evidence that schools that had integrated ICT as part of their education, had a higher rate of motivation and understanding amongst the students, and as mentioned earlier students with literacy difficulties have a need to feel motivated and develop positive self-esteem. (Skolinspektionen, 2012).

Furthermore, research made by the *knowledge foundation,* a foundation that helps Sweden to develop its school curriculum, regarding the subject of ICT usage and its complications in school; also states that more than half the teachers that were asked about using ICT as a tool in education see the clear benefits of using it (Gu, 2011 p. 34). The teachers participating in the research indicated that ICT could be stimulating for students when it comes to learning how to read and write, and that motivation amongst the students increased when computers were

involved. However, the teachers who participated in the research also thought that there were large barriers when it came to the use of ICT. Not all students are at the same level, as some students have computers at home and some do not. It can also be hard to have ICT as a teaching aid when the equipment itself is of poor quality and the teachers do not have enough qualifications or knowledge on how to use the technology itself. Teachers in this research, made by the *knowledge foundation,* could not deny that they were afraid to fail whilst using computers. They felt that they did not have enough knowledge regarding the use of computers and therefore many teachers do not use them (Gu, 2011 pp. 35-36).

2.2. Definitions of terms

2.2.1 Dyslexia and word blindness

A child´s disability of not being able to read and write can be due to numerous things, such as bad education within reading, social problems or a neurological problem that the children are born with. Dyslexia researchers say that dyslexia originates from a special weakness in one or more centers of the brain, which has an important role when people are learning how to read and write (Ericson, 2010 p.35). However, this special weakness within the brain has no effect on peoples' intelligence, and students with literacy learning difficulties have the right to know why they have trouble reading. There is, according to research, different types of dyslexia: auditory dyslexia, visual dyslexia, audio-visual dyslexia, emotional and educational dyslexia (Ericson, 2010 p.36). Dyslexia can be inherited from relatives who have the same diagnosis, and it is estimated that 5-8 % of the population in Sweden are affected by dyslexia (Specialpedagogiska skolmyndigheten, 2014). While dyslexia varies from individual to individuals, there are some common symptoms to look for. Children with dyslexia often find reading books and letters boring and they have trouble when it comes to remembering what they have read. They have a hard time figuring out how the words are pronounced and how the syllables sound, and can therefore have trouble putting words into context (Specialpedagogiska skolmyndigheten, 2014). These aspects of dyslexia are what will be examined in this degree thesis.

Another type of literacy difficulty can be known as word blindness. Word blindness was used in the early stages of discovering reading and writing difficulties, but has in recent years been called *specific reading and writing difficulties, serious reading and writing difficulties and*

dyslexia. Word blindness is not used anymore as it is associated with blindness and blindness is normally something that cannot be treated, whereas literacy difficulties can (Ericson, 2010 p.37).

2.3. Information and communication technology – ICT

Information and communication technology, ICT, is a concept that is difficult to define. It must be divided into two parts to be properly understood. It originates from IT, which is defined as follows; "IT, information technology, collective term for the technical opportunities created by advances in computer technology and telecommunications" (National Encyclopedia, 2015). ICT is then defined as IT with the addition of communication. Information and communication technology is a wide term that includes devices that can be used in a technological way such as computers, tablets and phones. There are more definitions such as Svensson 2008 who defines ICT as following:

> What is intended by information technology varies greatly depending on the experience the person using ICT has. A key component seems to be just the communicative aspect where computers are connected in any kind of network. It is more likely that the use of instant messaging, web pages and social networks are classified as information technology then word processing on a computer that is not connected to a network (Author's translation from Svensson, 2008, p. 12).

2.4. Theoretical perspective

One of the main ideas of this thesis is to find out what the research says about ICT and how its use can help students with literacy difficulties, in their learning. ICT can lead to more individualized education, something that the behaviorist theory advocates. This theory discusses how you reinforce human behavior by showing learners what they have done right (Säljö, 2010 p.146). Within this theory the idea is that it is important to educate humans' step by step and by acknowledging efforts and giving rewards when each step of learning has been achieved. This theory also examines the idea of how reinforcement can be used as a learning technique. The reward and reinforcement should be instant so that the learner will feel success when they do something right. The theory also argues that educational technology such as

computers, where the content is divided into small parts or into groups, can be a good way of increasing humans´ learning curve (Säljö, 2010 p. 147).

As mentioned earlier, the behaviorism theory insists that individualism is emphasized. The main focus in the behaviorist theory shall lie on the student themselves and "in this sense, the behaviorists approach, in regards to learning is an individualistic theory, which focuses on the individual and their behavior" (Authors Translation from Säljö, 2012 p. 149). Students with literacy difficulties have a disadvantage when it comes to basic reading and writing skills, and therefore do not have the same starting point as students who are learning to read, but do not have a learning difficulty. ICT can therefore be used to give these disadvantaged students the extra support they need. Säljö (2010) states that computers can be used to give the direct reinforcement and rewards that these students need (2010 pp. 150-151).

The behaviorism theory has a focus on individualism and the extra support that ICT can give can be connected with individualization. The idea of individualization can also be connected to the cognitive traditions and Piaget´s theory about how students need to be mature to be able to learn. If they are not mature for the task given they will not be able to make full use of the material given. This can lead to that the student will not be able to learn what was intended. An individualized education needs to apply, something that computers can provide (Säljö, 2010 p.156).

ICT as a tool for a more individualized education is discussed by Estling Vannestål (2012) and the author suggests how ICT can be used in three different ways. The first area is an *automatic machine* such as computers or tablets, which are in direct alliance to the behaviorist theory and its views on how repetition and reinforcement can help students learn. Within this first area computers give direct response to a student in regard to whether an answer is right or wrong. The second area is *ICT as a tool* and how students themselves should use this tool to create material and concentrate on problem solving. This means using ICT to make PowerPoints and to see solutions to problems to develop more advanced skills. Vannestål writes that this tool can be very helpful for students´ English learning. The last area is *ICT as an arena,* which is more related to a sociocultural theory in a way where social interaction is an advantage for learning (Estling Vannestål, 2012 p.102). By using a digital arena, such as computer games, Facebook and other social media, for learning, it can benefit the students´ English development. ICT offers a more individualized education and can therefore offer students with literacy

difficulties an opportunity to develop. In addition, ICT offers direct feedback, which can improve self-esteem and the feeling of success, which in turn can lead to a better learning curve (Estling Vannestål, 2012 p.102).

3. Material and method

In this chapter the methodology will be explained and the research approach of this thesis will also be defined.

The aim of this study was to see what the literature says about how ICT can be used as a tool for students with literacy difficulties. The search for relevant material that suited the research question and aims of this thesis has gone through six different steps to find relevant material. This all started by analyzing previous degree theses to look through what literature they had used. There were numerous sources found in the previous degree theses that were read and those which looked interesting were searched for in a Google search. The literature found on these Google searches varied in relevance and the literature that was relevant was downloaded to see if it had met the criteria's for this thesis. The material that was found was divided into two different categories – usable and unusable. The criteria for the materials´ usability relied on if they were peer reviewed and/or if it was general literature regarding the subject. The general literature that was found had been part of previous degree theses which was looked through and by looking at the title it could be decided if it would be used or not. This was because if the title had, for example, *ICT and math* as a subject, the book would not be chosen for this thesis. Material that was excluded within this first phase included literature which was other degree theses, as these were not allowed to be used as research. Literature that was irrelevant when it came to answering the research questions and aim of the study was also excluded. Some literature on ICT seemed appropriate at first, but was only retained if the subject was ICT as a tool to help literacy development. Furthermore, the literature that was excluded concerned ICT and other subjects such as development or math, something that did not apply for this thesis. This led to 27 different articles and books that needed to be read and reviewed. The theses started with the abstracts and the table of content to see whether the 27 different findings could be used. After close examination of the abstracts and table of content six books were chosen to be used in the introduction and the background part, and eight peer - reviewed articles and studies were selected to be part of the analysis.

3.1. Design and selection strategies

The structure for this degree thesis is to do a literature review within the subject of how ICT can help students with literacy difficulties. This method aims to "identify all the available evidence that is relevant to a given theme [...] a literature review means that systematically search for, critically assess and then compile the literature within a chosen subject or problem area" (Authors translation from Eriksson Barajas, Forsberg & Wengström, 2013, p. 31). The framework is a literature review, where previous research within the subject has been examined based on relevance. Within this framework, theses, scientific articles, books and reports have been read, and are the basis for the data that has been collected and then analyzed. In order to start the search, a subject was decided on and evaluated based on relevant issues within the Swedish schools. Also the issue needed to be something that the author had previous experience with and had seen as a problem that needed to be explored more. The next step was to create a research question that was related to the subject that was chosen, and could be answered based on previous research and that was related to present time. Once the research question was decided, relevant search words were selected in order for the relevant material to be found. The material found was then reviewed critically and analyzed in order to confirm their validity, and to decide which ones were suited in regards to answering the research question. (Eriksson Barajas, Forsberg & Wernström, 2013, p. 32)

The research started when the subject of the degree thesis was selected. A meeting with classmates was held in the hope of finding topics that would be interesting to research. It was important to choose a subject that would lead to more knowledge within the subject. After much consideration it was decided that reading difficulties and literacy learning within the subject of English was something very interesting, and is a very important subject in Swedish schools today. The strategies used within this thesis were limitations within the searches. However, the results of this thesis are in connection to the chosen search words and if different search words were decided, the result might have been different. To find the most appropriate material the search words were limited in order to eliminate the number of results. The search words were: *ICT in education, ICT + dyslexia, Dyslexia, Dyslexia in the classroom* ICT, ICT* and Dyslexia, ICT* or reading difficulties and college, IKT och Lässvårigheter, Alternativ Teknik.*

3.2. Analysis

The articles chosen in the search for relevant research regarding the subject of ICT and literacy difficulties have undergone a systematic content analysis. This means that they have been analyzed with the aim to discover different patterns within the texts that are similar or different in regards to the aim and research questions of the study. The analysis was made with the help of questions and the answers were later summarized into a table. (Eriksson Barajas, Forsberg & Wernström, 2013, p. 147) In table 1 the questions asked in the search for relevant articles are reported.

3.3. Ethical aspects

This thesis has considered many different viewpoints and has welcomed researchers input and their previous findings. The use of multiple opinions and findings has been important for the thesis, in order to give it variation and to receive more certainty when answering the research questions. Eriksson Barajas, Forsberg & Wernström (2013) state how a literature review considers the previous research and how the research questions have been answered. According to Eriksson Barajas, Forsberg & Wernström, when the previous research is chosen it is, important that the literature chosen for the thesis has been approved and that ethical principals have been included when the research had been made. This applies within this thesis, where only peer reviewed material was chosen. The authors also state that all literature chosen for the thesis has to be presented and analyzed, as it is considered unethical to exclude literature that does not fulfill the criteria and does not answer the research questions. (2013, p. 70)

4. Results

The material that was selected and read showed some errors when it came to the criteria of this thesis and another selection of the material had to be done. A table for relevance assessment, table 1, for organizing (Eriksson Barajas, Forsberg & Wernström, 2013, p. 178-192) the material in relevance was made.

Table 1 – Relevance assessment

	Questions for analyses	YES	NO
1	Is the aim of the study being described?		
2	Are the research questions well described and related to the purpose?		
3	Is the material easy to read and is the aim of the material defined?		
4	Where has the study taken place? Country, city etc		
5	The research group? Can it be seen as valid it terms of age group, - (large enough etc?)		
6	Does the material consider any ethical aspects?		
7	Is the study's methodology clearly described?		
8	Does the result agree with the aim of the material?		
9	Is there a discussion of the results?		
10	Are the study's limitations and shortcomings, its validity and reliability discussed?		
11	Does the study discuss ICT and/or reading difficulties?		
12	Does the study give examples of different types of tools within ICT or give examples of reading difficulties?		
13	Does the study discuss how ICT can help students with literacy difficulties?		
14	Does the study discuss how ICT can be beneficial when compared to traditional learning?		
15	Notes:		

This table made it clear that another search needed to be done. This was because a number of materials found were not valid in terms of question five, and the target age group of grades 7 to 9 in Swedish schools. The second search began in the database Summon on Högskolan Dalarna´s university internet library. The restrictions used on all searches that were made in this second search were that the material had to be a scientific peer reviewed article, published from 2005 onwards. The materials that were not classed as previous research and that had been peer reviewed, needed to have been published after the year of 2005 and had either ICT in the title, or concerning the subject of reading difficulties. However, in the first search, which included looking for material that had been used in old degree theses, had found previous research made by the Swedish national agency from the year of 1997. This literature does not follow the criteria of being published after the year of 2005, but was found valid in regard to the relevance assessment table. The initial search words that were used were *ICT and Education*, *ICT + Dyslexia, Dyslexia, Dyslexia in the classroom* ICT*. This search was

unsuccessful, as only one out of 274 articles found could be downloaded and used as material in this study. The search continued to the database ERIC (ebsco), which was also found on Högskolan Dalarna`s university online library. The search took on new search words and they included *ICT* and Dyslexia* and *ICT* or reading difficulties and college.* At times truncation (*) was used, which would result in more matches. The initiative to begin a new search was done because of the lack of valid material that was related to the relevant age group for this thesis. This search resulted in 265 texts found and two of these were downloaded and read, to be used in the analysis. The process of finding these articles and the information on how many hits the different search words gave can be found below in Table 2. The next database searched was Google Scholar and a different approach was used in order to get a broader perspective: so the search words for the next searches were in Swedish. The decision on choosing Swedish search words was made because the study had not found valid material that had a main focus on Swedish schools. *IKT och lässvårigheter* was the first search word used and resulted in 147 texts found; one was downloaded and used as material for this study. One more search was made in DiVA, which is Högskolan Dalarna´s university own online database to search for material, with the search word *alternativ teknik* which had no result. Table 2 shows how the research was made in a systematic way, and the number of hits each search word gave. Table 2 also explains the number of abstracts which were read and how many texts were used when the search was done.

Table 2

Database	Search word	Restrictions	Titles	Titles Read	Abstracts Read	Used Articles
Summon	ICT in Education	Peer reviewed Full-text Since 2005 Journal article	170	91	4	0
Summon	ICT + Dyslexia	Peer reviewed Full-text Since 2005 Journal article	0	0	0	0
Summon	Dyslexia	Peer reviewed Full-text Since 2005 Journal article	94	31	12	0
Summon	Dyslexia in the classroom* ICT	Peer reviewed Full-text Since 2005	10	10	3	1
Eric (ebsco)	ICT* and Dyslexia	Peer reviewed Full-text Since 2005	2	2	2	1
Eric (ebsco)	ICT* or reading difficulties and college	Peer reviewed Full-text Since 2005	263	157	11	1
Google Scholar	IKT och Lässvårigheter	Since 2005 - 2015	141	86	9	1
Diva	Alternativ teknik	Since 2005 – 2015	14	5	0	0

After the systematic search was done for the research aim of "ICT as a tool for students with literacy difficulties", the material shown in Table 3 was selected and used as the basis for the analysis and background. Some other books were also selected as background for further knowledge within the subject. These books were chosen together with the local librarian at the central library in the town of Malmö, in Sweden. The criteria when choosing these books were that they needed to be published after the year 2005 and have either "ICT" in the title, or be concerning the subject of reading difficulties.

Table 3 Summary of articles

Title and Author	Note	Background/ analysis or no use
Brodin, (2010). *Can ICT give children with disabilities equal opportunities in school?* '	Swedish study – 16 parents and children were interviewed. The aim of the material was to see if ICT can promote inclusion of children with motor disabilities (Low validity due to the disability)	No use due to the disability discussed. The study does not include literacy difficulties
Barden, (2014) *Facebook levels the playing field: Dyslexic students learning through digital literacies*	English study – small group of sixth form students. The use of everyday technology (Facebook and social media) as a tool for students with dyslexia.	Analysis
Cheung, Slavin, (2012) *Effects of educational technology applications on reading outcomes for struggling readers: A best evidence synthesis*	America study – META analysis on 84 studies. Examines the effectiveness of educational technology to improve reading achievement for struggling readers. (Low validity due to the age group)	No use due to the age group. The study discusses elementary kids not grades 7 to 9.
Conway, Amberson, (2011) *Laptops meet schools, one-one draw: m-learning for secondary students with literacy difficulties.*	English study - 31 schools participated in the study. Observations and interviews/surveys. Aim to identify how laptop computers could be used to support second-level students with literacy difficulties.	Analysis
Gu, (2011) *From national commitment and initiatives to implementations in the classroom: Some critical issues on integration of ICT into education in the Swedish context*		Background
Judge , Floyd, (2012) *The Efficacy of Assistive Technology on Reading Comprehension for Postsecondary Students with Learning Disabilities*	American study – 6 people participated. Assistive technology to support reading comprehension in postsecondary students with learning difficulties.	Analysis
Lund, (2012) *Satsningarna på IT används inte i skolornas undervisning.*		Background/intro
Skolverket, (1997) *IT-läromedel för dyslektiker*	Swedish study – evolution on the use of ICT as a tool for student's with literacy difficulties. Very good but from 1997	Analysis – This will be used but it is published 1997. However, the material is relevant in all aspect of the thesis.
Vannestål, Estling. (2012) Att ta in varlden I klassrummet – om digital teknik I sprakundervisningen.		Background
Williams, Jamali, Nicholas (2006) *Using ICT with people with special education needs: what the literature tells us*	English study – Literature review. The use of ICT for people with special needs. Too little information about the subject.	Will not be used.

4.1. Presentation of Articles

Table 3 gives a summary of which articles were chosen for this degree thesis. The first article chosen was Barden, *Facebook levels the playing field: Dyslexic students learning through digital literacys* from 2014. This study was on a small group of sixth form students that had been diagnosed with dyslexia. The researchers state that students with dyslexia forget what they have learned very quickly and are disorganized. The researchers also state that previous research that has been made says that there are many other problems associated with dyslexia such as stress, low self-esteem and social problems. In this sense the authors indicate that ICT can be seen as a way for students with these difficulties to overcome obstacles within education; ICT can be very helpful due to the quick way of providing information, which provides an easier way of learning. The research of this paper is whether Facebook can be used as an everyday tool for students with literacy difficulties. The results in this study show that Facebook and ICT interaction can develop students´ meta-cognitive awareness. Digital media such as Facebook can eliminate many stressful situations, as it can be individualized. In addition the confidence of students might develop because they are not being judged when they make small writing mistakes in a conversation on Facebook. The aim, to see if Facebook could be used as a tool, was proven positive and the participants of the study felt that ICT motivated them to develop their learning curve. However, the study states that reading and writing difficulties such as dyslexia will still be a challenge for those who are suffering, despite the help of ICT.

The Efficacy of Assistive Technology on Reading Comprehension for Postsecondary Students with Learning Disabilities written by Judge and Floyd in 2012, discusses how assistive technology for post-secondary students can support reading comprehension and learning difficulties. The study examined how ICT tools such as screen readers and speech synthesis could help students with literacy difficulties. Screen Reader was first developed for students who were blind, but has in recent years been proven to help students with literacy difficulties and to increase their reading comprehension. Speech synthesis has, according to this study, improved students´ proof-reading skills which can be very helpful for students with literacy difficulties such as dyslexia. By using ICT in both examples above, it gives a more individualized education and the students can pause mid text and rewind if needed. Another

tool for improving the students´ literacy, mentioned in this study, was the Classmate Reader. This tool is a portable text reader. This tool gives students the opportunity to listen to a text and follow a highlighted text on an ICT device, something that can give students with dyslexia a higher sense of confidence. The students can decide in what manner they want the text in regard to color, size and font, which leads to a more individualized education. Getting the text read out loud, which allows the student to follow in the text at the same time, improved their understanding of the content of the text. The outcome of the study is that assistive technology can be a useful tool in education for post-secondary students with literacy difficulties, but they do state that more research needs to be done.

The next article analyzed was *Laptops meet schools, one –one draw: m-learning for secondary students with literacy difficulties* written by Conway and Amberson, and is a study made in the UK on secondary school students. This study had the aim of discovering if laptops can be used as learning support for students with literacy difficulties. The authors discuss how ICT has to be used in today's education, as it is important for this technology to be integrated into students´ everyday lives. They also state that ICT has huge potential when it comes to education and offers great opportunities, especially when it comes to educational potential for those with literacy difficulties. This study was, as mentioned earlier, made in the UK and 31 different schools were involved.

This study, made in the UK, had the aim of discovering if laptops can be used as learning support for students with literacy difficulties, since dyslexics and students with other reading difficulties often have a disadvantage with their education according to Conway and Amberson. They argue how this disadvantage can lead to low self-esteem, poor motivation and that they can feel embarrassed and frustrated. Laptops were used in this study more as an everyday tool, instead of being an innovation that could help students who needed it for extra support. With this said the authors did explain how laptops can have a huge impact on students with literacy difficulties and that by using computers a more individualized education can apply.

Working with literacy difficulties such as dyslexia and how to apply a more individualized education is something the last article chosen for the thesis explores. The Swedish national agency for education wrote a guide for all teachers who were working with students with dyslexia. This guide is based on research, interviews and surveys that were conducted throughout Sweden regarding the subject of ICT as a tool for students in grades 7 to 9 with

dyslexia. This study states that ICT creates opportunities for students with literacy difficulties to work at the same level as students who do not have these difficulties. According to the teachers who participated in the interviews they argued that "multimedia programs have a positive impact on the learning outcomes on students because several senses within the brain are used simultaneously in learning situations" and "students with reading - and writing difficulties need technical aids to easier assimilate the textbook texts and its content" (Skolverket, 1997 pp. 5 - 7). The study also states how students with literacy difficulties can benefit from using computers in education. Students were better able to write long texts and thought it was more fun being educated with the help of a computer. Students could also work at their own pace and got a direct response whether an answer was incorrect or correct. Different types of screen reading programs were also a huge help for students with dyslexia, as the computer read the words and the students could follow the text. A more individualized education could also be applied with the help of ICT. This individualization was in a way which gained an increased motivation and that computers were seen as a good extra help in relation to traditional education. The study also states that working with computers gave some sort of status, and that the students could work by themselves and this gave self-esteem to students involved in the study.

In addition to this study a survey was also done on whether ICT had an advantage in comparison to traditional education techniques, such as books and a teacher-centered education, which came to the conclusion that it does. Students with literacy difficulties had a higher rate of educational success when ICT was used. The instant feedback that computers provided was also important in the comparison of traditional education and ICT focused education. However, the survey stated that teachers needed to support the student more when ICT was used, when compared to traditional education.

5. Discussion

5.1 Main findings

The aim of this study was to see what the literature says about how ICT can be used as a tool for students with literacy difficulties, with the following research questions in mind:

• What does the research say about how the use of ICT in education can positively affect the literacy learning in English for students with reading difficulties?

• What does the research say about the didactic benefits of ICT in relation to traditional English teaching, such as books and a more teacher centered education?

This thesis started by looking for relevant material that would discuss the aim and come to a conclusion. Four peer-reviewed materials were selected to analyze. In regards to the research question of how ICT could be used as a tool in education and positively affect literacy learning, the literature analyzed had one thing in common: they all emphasized how important ICT was to give students with literacy difficulties an education that is similar to the students who do not have any difficulties. Also, they all showed how ICT can be used as a tool to individualize education and how it can motivate students to increase their learning curve. This thesis has found that one of the largest problems a student with literacy difficulties has, apart from not being able to read easily, is that the students often have low self-esteem, are insecure and unmotivated. These factors could be helped with the individualization gained by the use of ICT according to the literature which has been analyzed.

Tools such as Screen Readers, screen synthesis and Classmate Reader have been brought up in one article and discussed in regard to the research questions. These have all been seen as successful tools to use to improve literacy for students with literacy difficulties. The literature also stated that ICT tools can help students to concentrate better, and that with ICT tools students can choose their own font, text size and type to their preferences.

In regard to the second research question which examined whether ICT can have any didactic benefits in relation to traditional education, only one of the chosen materials discussed this

topic. This study made an interview on whether ICT could be preferred over traditional teaching tools, and two teachers said that it could. The teachers interviewed, stated that it could be an advantage to use computers in comparison to traditional education. However, the lack of material referring to the comparison between ICT and traditional educational techniques makes it hard to find a satisfactory answer to the second research question. This result could be due to the lack of previous research made within the subject.

5.2 Limitations

A number of criteria for the material used in the study needed to apply. These criteria needed to be fulfilled for the material to be considered. The first criterion for the material chosen was: if they were peer reviewed and/or if it was general literature regarding the subject. Then a limitation within the search was that the material needed to be peer reviewed and published after the year of 2005. A search together with the local librarian in the town of Malmö had the criteria that the material needed to discuss the topic of ICT in education, and the second criteria that the material needed to discuss some sort of learning difficulties. These limitations within the search for material made it hard to find reliable material, due to the extent of different learning difficulties. The limitations were then narrowed down to learning difficulties that only included reading and writing difficulties, and foremost literacy learning difficulties such as dyslexia, which in turn led to finding literature which mostly concerned dyslexia. The restrictions that were made also made it difficult to find material that included both subjects together.

Due to the short timeframe of this literature review and the lack of relevant material and research, the thesis can determine, in regards to the second research question that more research within this subject needs to occur. This outcome could have been different if other search words had been chosen, or if more general information in terms of traditional teaching techniques verses ICT had been included in the thesis. Examples of other search words could have been: *Reading difficulties and secondary school, language disabilities, learning English with dyslexia, ICT and reading difficulties.* This thesis all had a limitation to grades 7 to 9 and only found one previous research made within this subject.

5.3 Further Research

The main finding of this thesis suggests that ICT can be a used in education to help students with literacy difficulties. Different tools such as Class Readers, Screen Readers and screen synthesis have been suggested and experimented on students, in one study. Online tools such as Facebook have also proven to give students with literacy difficulties a higher feeling of success and self-esteem, something that is important for literacy development. Hence, more research referring to whether ICT can be better preferred to traditional education needs to be explored. Also more research on what kinds of apps and other resources that are available, needs to be examined and tested on students with literacy difficulties. One of the most important findings of this thesis is that ICT can lead to an increased motivation amongst students with literacy difficulties. However, more research within the subject of ICT, and especially more tools, needs to be explored to be able to give students with literacy difficulties a better chance of developing their reading comprehension. More research needs to be carried out, and more knowledge on how to use these tools, needs to be discovered.

5.4 Conclusion

This degree thesis has found a satisfying result in regards to the first research question which searched for answers regarding how ICT can be used as a tool for students with literacy difficulties. Four previous studies have been read and analyzed and they have all been positive towards the use of ICT in education. Students with literacy difficulties often have, according to the material used in this thesis, low self–esteem and are not motivated to learn. This thesis has come to a conclusion that ICT can help students to feel more motivated and this increases their self–esteem. The previous research examined in this thesis also suggests that a more individualized education could apply when ICT is being used, something that has been seen as positive.

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