TEACHING WITH DIGITAL TEXTBOOKS: POSSIBILITIES AND CHALLENGES FROM THE TEACHER PERSPECTIVE

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Abstract

An increasing amount of students' and teachers' work in the classroom involves digital technologies such as tablets and laptop computers. In this preliminary study, the use of digital textbooks in the classroom is explored through interviews with two teachers at an independent upper secondary vocational school. Both teachers use digital textbooks in their teaching and express difficulties in having time to review digital textbooks and supporting student work in the classroom. At the same time, the teachers report possibilities to individualise learning activities for students, providing structure for students as well as increasing accessibility to the textbooks during non-school hours.

Introduction

New digital technologies are now a natural part of society as well as in schools (Säljö, 2010). In many classrooms, teachers and students work with their own laptops or tablets in one-to-one (1:1) initiatives, meaning one laptop or tablet per student (cf. Richardson et al., 2013). The possibilities for teaching and learning with these technologies and creating supportive conditions for Technology Enhanced Learning (TEL) appear to be strong (Balanskat, Bannister, Hertz, Sigillò, & Vuorikari, 2013). Internationally, policy pushes forward the need for teachers to help students gain 21st century skills such as critical thinking, problem solving and digital competence in the digitalised classroom (Organisation for Economic Co-operation and Development [OECD], 2012)). In the Swedish context, these intentions are also expressed in policy. However, despite high levels of digital access in schools, use remains at a low level (National Agency for Education, 2016; The Swedish Schools Inspectorate, 2012). This may mean that many students, despite the intentions of policy, are not developing the digital competence they need for future work and studies (Voogt, Erstad, Dede, & Mishra, 2013).

In Sweden, several projects have investigated the implementation of digital technologies in schools (cf. Håkansson Lindqvist, 2015; Jedeskog, 2007; Tallvid, 2015). Recent reports show that while accessibility to technology in Swedish schools is relatively good, for example through on student one computer (1:1) initiatives, the technology is not being used as expected (National Agency for Education, 2016). Thus, further proposals to strengthen digitalisation in schools were addressed in an official government report on digitalisation (The Swedish Government, 2014) and *The National digitalisation strategy for schools* (The Swedish Government, 2017). Using the concept of *adequate digital competence*, policy aspires to strengthen and support students' digital competence and teachers' and school leaders'

professional development within the area of digitalisation. It appears that the uptake and use of digital technologies as educational tools requires continued efforts in professional development for teachers and school leaders (Grönlund, 2104; Håkansson Lindqvist, 2015; Tallvid, 2015; Vrasidas, 2015) and takes time (Ertmer & Ottenbreit-Leftwich, 2013; Vrasidas, 2015).

In helping teachers to support students' learning with digital technologies, it could be anticipated that the digital textbook would have a strong role (cf. Gu, Wu, & Xu, 2015). However, it appears that teachers' use of digital textbooks may be similar to the uptake and use of digital technologies on the whole. The Swedish Association of Educational Publishers reports a low level of investment of digital textbooks per student compared to investments in laptops, i.e., 27 SEK compared to 1 770 SEK per student (Swedish Association of Educational Publishers, 2013).

Aim and Research Questions

The aim of this paper is to explore, identify and describe the possibilities and challenges related to the uptake and use of digital textbooks in the upper secondary classroom. The paper seeks to examine teaching activities in the use of digital textbooks from the teacher perspective. The following research questions are hereby put forward:

1. How can teaching activities regarding the uptake and use of digital textbooks in the classroom be described?
2. Using the Ecology of Resources Model (Luckin, 2010), how can possibilities and challenges in the uptake and use of digital textbooks in teaching activities in the classroom be understood as conditions for TEL?

The paper aspires to contribute to the area of TEL through the use of digital textbooks.

Short Survey of the Field

Digital textbooks can be seen as an important part of an electronic schoolbag as well as a main resource for learning (Gu et al., 2015). There are challenges such as design and development (cf. Gu et al., 2015) and implementation in the school context (cf. Horsley & Martin, 2015; Kim, Kim, & Choi, 2012), from both teacher and student perspectives (cf. Joo, Park, & Shin, 2017; Millar & Schrier, 2015; Weisberg, 2011). Researchers note challenges related to technology and copyright issues, but also possibilities such as providing both up to date information and multimedia-based learning (Gu et al., 2015). There is also an opportunity for teachers to use the digital textbook to support learning activities of students both inside and outside of the classroom (Horsley & Martin, 2015). Understanding teachers' uptake and use of digital textbooks as users is needed in order to determine the conditions and aspects of digital textbooks that can support TEL (cf. Gu et al., 2015). In the Swedish context, research related to the uptake and use of digital textbooks for teaching and learning in the classroom context appears to be relatively unexplored. In summary, the literature appears to focus on design, development, implementation and the need for further study of how teachers in practice use

digital textbooks to support students' learning. More research is needed in general (Swedish Association of Educational Publishers, 2013) and more specifically, for quality control of an expected expanding educational area. There is also the need to exploit digital textbooks as a research instrument for studying learning (Gulz & Haake, 2014).

Theoretical Framework

The Ecology of Resources Model (Luckin, 2010) will be used as a framework, in order to examine and describe the teaching activities. The possibilities and challenges for teachers regarding digital textbooks will be analyzed using the three resource elements, *environment*, *knowledge and skills*, and *tools and people* and the theoretical concept of *filters* (Luckin, 2010). In the model, filters may restrain or impede the learners' (teachers') access to the resource elements available. By studying and identifying possible filters, it is possible to alleviate the filters and gain access to the resources to a greater extent.

Method

The data for this preliminary, or exploratory, study were gathered through semi-structured interviews with a sample size of two teachers. The teachers were chosen as they both were teachers of Swedish and English and both had experience working with digital textbooks. Both teachers work at an independent upper secondary vocational school. The school provides vocational training in 11 different programs, from building to electrical programmes to florist and restaurant programs. At the time of the interviews, which took place during December 2017 and January 2018, there were some 110 students and 12 teachers at the school.

Data Collection Design

In this small preliminary study, semi-structured interviews were used as a data collection method as a starting point. In the interviews, an interview guide was used, with 12 questions, regarding both background information and how the teachers used digital textbooks in the classroom in practice at the upper secondary school level. Examples of the questions were how the teachers used digital textbooks in the classroom, the choice of digital textbook and possibilities and challenges from their perspectives as teachers as well as their views on the student perspective. One of the interviews took place at the school, while the other interview took place at the teacher's home. Both interviews took approximately one hour. The interviews were transcribed in verbatim. In this paper, the teachers' views have been reported using fictitious names, *Sara* and *Jane*. Sara is 35 years old and has been working at the school for about one year. In her present position, she is temporarily employed at the school and teaches the subjects of English, Swedish and Swedish as a second language. Jane is 56 years old and teaches the subjects of English and Swedish at the school. She is also responsible for the subjects of English and Swedish at the school.

Approach to Data Analysis

According to Hjerm and Lindgren (2010), meanings can be coded by applying names and documenting a description of the contents. Thus, the interview

transcripts were coded and categorised according to Hjerm and Lindgren's method in which the teachers' answers to the interview questions were coded using content analysis. These codes were then analysed and placed into categories of meaning. These categories were then analysed using the Ecology of Resources Model (Luckin, 2010) and the theoretical concept of filters. Through the identification and analysis of filters it is possible to alleviate filters and gain access to the resources available to a to a greater extent. In this paper, how possibilities and challenges related to the uptake and use of digital textbooks can be said to manifest filters is used for analysis and to support understanding.

Findings

In this section, the findings from the interviews are presented according to themes found within the resource elements *environment, knowledge and skills* and *tools and people*.

Environment

The findings related to the resource element Environment are presented according to the following themes: *choice of digital textbook and resources, supporting students' independent work, access to laptops in the classroom activities,* and *bridging schoolwork between school and home.*

Choice of digital textbook and resources. Sara describes a high level of freedom to choose the digital textbook to work with in her teaching activities. However, digital textbook selection is a time-consuming process: "Being new [as a teacher], to find the right digital textbook … It takes time, but at the same time I think it is fun, but I really have put a lot of time into finding good things." Sara also explains that sometimes there is a trade-off in the structure of the digital textbook and the content:

> For example, the digital textbook that I am using right now, there is also a paper-based textbook. But I think that the other textbook is better. So there is a balance between using the paper based version and the digital version together.

Sara also describes that finding Internet resources to use, as digital textbooks or in place of digital textbooks, is also time consuming due to the large amount of resources available. Jane also notes the freedom to choose textbooks: "There have never been any problems in ordering textbooks."

Supporting students' independent work. When working with students using digital textbooks to support students' independent learning, Jane expresses the need to give the students time to find their own way of working. Jane explains that she uses an older version of a digital textbook with students who have difficulties reading and writing:

> The head office laughed at me. You're still using that book… but there is an order and a structure… and it is actually order and structure that students need. It saves a lot of time, both for the students and me.

The idea of structure and order to support students' work is important according to Jane: "I have tried several versions of digital textbooks… and both the Swedish teacher and I feel that it [this book] is chaos compared to the earlier version." Sara notes that one hope she had with her work with digital textbooks was that the students would be able to work more independently. Here the challenges lie in technical aspects, for example, "What is my User Identification (ID), what should I click on now, and so on." Sara also sees large variation in student use, with some students being "very digitally competent" and other students who "hardly know how to start a computer and really don't understand" with some students changing the passwords on purpose as a way to avoid working. According to Jane, one of the challenges with digital textbooks, as well as laptops, is distraction, especially among students who lack motivation: "I have a lot of students and just can't check them all, all of the time."

Access to laptops in the classroom activities. Sara describes that the students use the laptops in the classroom, but they are not the students' own laptops as in 1:1. Here, the challenge is in accessing the laptops: "Will I be able to use the laptops during his lesson?" However, new laptops were going to be provided which would also make access to laptops at the school easier. Sara also sees possibilities in 1:1: "I don't think that it would solve all of the problems, but I think in one way, that the students would appreciate it."

Bridging schoolwork between school and home. According to Jane, many of the students enjoy working with digital textbooks. The students also enjoy being able to work with the textbooks both in the classroom and at home and do not have to carry the book with them: "They can go in to the laptop at home and log on and practice English at home." The students have the opportunity to work in a digital textbook that bridges schoolwork between the classroom and home environment.

Knowledge and Skills

The findings related to knowledge and skills are presented in two themes: *own knowledge and skills* and *students' knowledge and skills.*

Own knowledge and skills. Both teachers report having their own knowledge and skills for their teaching activities. Sara is confident in her knowledge and skills and feels quite comfortable working digitally. She does not see any challenges: "It is more about finding routines, to get into the habit. The challenges have been more resources, having enough laptops and enough time to find the right digital textbook." Sara also notes that professional development would help to use digital textbooks in a more efficient manner in which she perhaps could gain time: "Instead of taking time, I could use the time efficiently." Jane sees the need for constant professional development to help students: "There is always something new and you have to keep thinking all the time. How do I solve this right now?" Jane has taken the advantage of the students' skills: "Since, I don't know a lot myself. I need to use the students for help [laughs]." Jane also feels free to ask colleagues for help: "I am going to have Sara help me and teach me… so that I know how it works."

Students' knowledge and skills. In regard to students' knowledge and skills, both teachers in this study see the need to support students' knowledge and skills. Sara sees the importance of facilitating students' digital competence: "There are certain aspects of digitalisation that they [the students] are not familiar with… how to do a PowerPoint presentation for example." Jane also reports different levels of digital competence among students:

> They come with different levels of laptop skills. On the one hand, we have the gamers, who know how the laptops are built and they know all about the processors and the graphics adapters, they know it all, but they can't use Word.

Jane sees an opportunity for digital textbooks in motivating students: "A digital textbook can actually awaken motivation, desire and interest, which is good. They have sat in the classroom with a blank piece of paper – write. And maybe one question on the whiteboard." However, there are challenges, especially for students who have difficulties in working with digital textbooks: "But, the students who can't manage this? If you [students] can't find things and find structure in the digital textbook […] we just lose these students."

Tools and People

The findings related to tools and people are presented in two themes: *digital textbooks as tools for students with special needs* and *functional aspects of digital textbooks as tools.*

Digital textbooks as tools for students with special needs. Both teachers in this study see possibilities in using digital textbooks as tools for student with special needs. Sara notes that she has ordered digital textbooks specifically for students with special needs, for the support they provide: "In Swedish, I have ordered digital textbooks for those students who have difficulties -- both writing and reading difficulties. A lot of it is about providing speech synthesis, text to speech and things like that. Despite the tools provided through the textbooks, Sara also perceives other challenges: "I don't think that they [the digital textbooks] are really pedagogically well-structured." According to Sara, another opportunity for students incorporated into the use of digital textbooks is the use of self-correcting tasks, which provide direct feedback to the students. Jane describes a change in the overall use of digital tools: "There are students who have worked with laptops and who are somewhat digitalized. You can see that they have used tools more than just the laptop, not digital textbooks, but digital tools to help them." One example, according to Jane, is the use of text-readers: "It is easy for students to find errors."

Functional aspects of digital textbooks as tools. Sara notes a function that the digital textbooks she works with do not provide. This is the possibility for students to work directly in the textbook:

> That they can work directly in the textbook… that they don't need to have a separate document on the side, when they are reading a text in Swedish for example, reading a text and doing tasks related to the text.

Sara also notes overall difficulties in the pedagogical structure of the digital textbooks, for example being able to have an overview of the structure of the

book: "You almost needed to have the paper version to understand the set-up of the book." Sara explains that students need to be able to move back and forth in the different chapters in the book, which can be difficult at times. Jane also gives an example in which students must work in the paper-based book to be able to complete tasks on the laptop, which is a challenge. Here, Jane explains:

> This is not structured and is a disadvantage, in my view, you should be able to combine the laptop and the book if you want to read and at the same time be able to do the same thing on the laptop.

Jane notes that dyslexic students who have difficulties with structure, have even more difficulties when the book is needed to work on the laptop: "It doesn't really work and I don't have the time to sit and help the students, and all of the students in the class need help at the same time." According to Jane, the students enjoy working with the older versions of the digital textbooks because they are interactive, which means that the students tend to be more active when working. Beyond the organization of the content structure in the digital textbooks, Jane also notes that a newer version of a digital textbook does not necessarily mean that the subject content is new: "The texts are not updated. The structure and the organization of the texts are good, but the texts are old."

In summary, for Sara and Jane, the possibilities for students are found in the digital textbooks themselves, which can provide structure and digital tools for the students. Digital textbooks can help students to be active and motivated in their learning and provide access for schoolwork both at home and at school. The challenges appear to be distraction due to access to the Internet when working with digital textbooks, access to laptops in the classroom and the functional aspects of the digital textbooks.

Discussion

The possibilities and challenges as perceived by the interviewees can be analyzed using the Ecology of Resources Model (Luckin, 2010) and the theoretical concept of filters within the resource elements *environment*, *knowledge and skills* and *tools and people*. In their teaching activities it will be necessary for teachers to support the use of digital textbooks in the classroom (*environment*), promote own digital competence and students' digital competence *(knowledge and skills*) as well as increasing their own use and students' access and use of digital technologies and digital textbooks in their learning (*tools and people*).

In the resource element *environment*, the need for teachers to support the use of digital textbooks manifests a filter. Teachers' capability to provide the learning activities for using the textbooks in the classroom, and the conditions for TEL will be important to support students' use of digital textbooks in the learning environment for both teachers and students (Horsley & Martin, 2015; Kim et al., 2012). Supporting students' learning in this classroom could also be considered to manifest a filter. In this study, teachers express challenges in supporting students' use of the digital textbooks. How teachers can efficiently

support students' individual and collaborative work will be of importance for creating conditions for TEL (Grönlund, 2014; Håkansson Lindqvist, 2015; National Agency for Education, 2016; Tallvid, 2015). In regard to the implementation of digital textbooks and other resources, time manifests a filter in several aspects. Teachers need time to implement the textbooks as digital technologies in their teaching (Ertmer & Ottenbreit-Leftwich, 2013; Vradidas, 2015). Teachers also need time to find, review and evaluate digital textbooks and other digital resources (Gulz & Haake, 2014). How teachers and schools can take on this task efficiently to advance the uptake and use of digital textbooks will be of importance for creating conditions for TEL in the classroom environment as well as in the home environment (Horsley & Martin, 2015; Voogt et al., 2013).

In the resource element *knowledge and skills*, professional development in ICT and subject-related skills for teachers are important (Grönlund, 2014; Håkansson Lindqvist, 2015; Tallvid, 2015; Vrasidas, 2015) in order for teachers to implement digital textbooks as a natural part of the digitalized classroom (Gu et al., 2015). This involves making the use of digital textbooks become a habit, according the teachers in this study. From the teachers' perspectives their knowledge with regards to working with the textbooks could be considered to manifest a filter in this resource element. Teachers need time to learn and increase their skills in working with digital textbooks and resources to support students' learning. This may take place both individually and in collaboration with other teachers, as noted by the teachers in this study. For teachers, the students' ICT skills could also be said to manifest a filter in this resource element. If the students are to increase their knowledge through the use of digital textbooks, they must have the ICT skills to manage the digital textbooks in practice (Voogt et al., 2013). Basic ICT skills are needed, as noted by both teachers, for being able to work and learn independently. The large variation in students' digital competence, as reported by both teachers in this study, can also be said to manifest a filter in this resource element (Håkansson Lindqvist, 2015; Tallvid, 2015). For teachers, supporting students' ICT skills and digital competence as well as introducing subject content knowledge may at times be a difficult balance.

Increasing teachers' own uptake and use of digital textbooks and providing possibilities to increase students' uptake and use of digital textbooks in school activities in the classroom could be considered to manifest filters in the resource element *tools and people*. Here, the technical challenge of not having enough laptops, or access to laptops, can be considered to manifest a filter in this resource element. Access to laptops is a basic condition for supporting TEL through the use of digital technologies (cf. Voogt et al., 2013). In addition, students' use of a laptop for non-school activities on the Internet when using digital textbooks manifests a filter in the resource element *tools and people.* Here, the motivation and desire which digital textbooks may inspire, according to the teachers in this study, will perhaps lessen the risk of distraction and help students to focus on their schoolwork and take advantage of the possibilities for learning (cf. Gu et al., 2015; Joo et al., 2017; Millar & Schrier, 2015; Weisberg, 2011).

One of the most interesting findings in this study is the perception of the amount of time required to review digital textbooks and select textbooks that are specifically suited to individual students in order to support students' learning. Despite having to perform several demanding tasks and a lack of time, both teachers in this study prioritise this review and selection work in order to support their students and strengthen the use of the digital textbook (cf. Gu et al., 2015). This may involve using an older version of a digital textbook with more organized learning content or it may involve other digital resources as an alternative digital textbook. It also includes reviewing a large number of digital textbooks, as well as other digital resources. Thus, for teachers, this work could also be considered to be a filter in this resource element. The findings highlight that teachers need technical and pedagogical support in the use of digital learning tools, including digital textbooks. This would help ensure that the most appropriate digital textbooks are selected in support of students' learning, and that the conditions for TEL are met (cf. Gu et al., 2015).

Implications for Practice and Future Research

The findings of this small preliminary study are of interest, as they show teachers' interest and initiative in the uptake and use of digital textbooks as well as alternative digital materials as resources in their teaching. Here, the teachers prioritize this time-consuming task in order to support students' learning in the digitalized classroom. How schools as organizations can support teachers' activities, both individually and collaboratively, to both make the work with digital textbooks more efficient is an important question for future research. Further how beneficial conditions for TEL can be created in the classroom to support students' learning with digitalized textbooks is of importance to study.

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