

A Cross-Cultural Study of Attitudes to Digital Tools among Students and Teachers in the European Language Classroom

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Abstract

In this pilot study, we focus on the use of digital tools in the teaching and learning of English in Sweden and Germany. English is the first compulsory foreign language in both countries. In both countries, there is also a new national strategy with proposals for actions to better exploit the potential of Information and Communication Technology (ICT) in education (Skolverket, 2016, Burchard et al., 2016, Regeringskansliet, 2017). Increasing importance is given to the use of digital tools in schools. In Sweden, every student receives a laptop from their school and this started about 10 years ago (Åkerfeldt et al., 2013) German students do not get a computer from their school and their exposure to English outside school is more limited than in Sweden. The hypothesis of this study is that there will be differences in the treatment of, and attitudes to, digital tools between the students and teachers, and between the two countries. Interviews were conducted with 9 Swedish and 7 German teachers of English and questionnaires answered by 15 Swedish and 40 German students in grade 6. The students were also asked to evaluate an English language learning game and the teachers were asked to rank four parameters on a Likert scale (Affect, Perceived usefulness, Perceived control, and Behavioral intention) when using digital tools for English language teaching (Teo, 2008). Our results show that the extent of digitalization in education differs between the two countries. Our study shows that the Swedish teachers employ a variety of tools, whereas there is a lack of access to computers as well as to digital learning tools in Germany. But even though Sweden has the technical tools, they are not used optimally due to a lack of in-service training. Neither of the countries has employed the use of games for language teaching and there is a tendency towards negative attitudes to “gamification”. We believe that a collaborative

approach and co-creation between teachers, students and entrepreneurs will help to design more efficient digital learning tools, which, in turn, will contribute to better learning outcomes.

Introduction

What role do information technology and digital media play in the language classroom? Over the years, technology has developed strong roots in the fields of education and pedagogy. Children of today have access to a number of learning platforms in which they interact with educational resources using predominately digital tools. Audio-visual methods and interactive portals are being increasingly integrated into the school education system. Motivation, encouragement and engagement have always been challenges in education. As Huang and Soman (2013) point out, gamification in pedagogy is aimed at helping people and nudge them towards increasing the likelihood of completing activities that otherwise could be boring or non-engaging in nature. When applied to education at school level, this pedagogical technique is able to meet the educational objectives while also integrating fun and enjoyment as factors in the learning process. While some researchers question this relationship and lay the emphasis on how digital pedagogy has reshaped childhood identity (Steinberg & Kincheloe, 1998), others see it as a new and varied way of learning, where digital narratives can have a profound effect on children's assimilation of knowledge and interest (Cummins, 2000; Unsworth, 2006). Some discourses "... position children as ready learners and new technology as offering endless easy-to-use resources for worthwhile learning" (Willett, 2007, pp. 168). In 2006, the European Commission identified eight common key competences for life-long learning (European Commission, 2010). Five of these key competences are: Communication in a foreign language; Digital competence; Learning to learn; Sense of initiative and entrepreneurship; and Cultural awareness and creativity, all important for the digitalization of education.

In this pilot study, we focus on the use of digital tools in the teaching and learning of English in Sweden and Germany. The reasons for comparing Sweden and Germany are as follows:

- (i) English is the first compulsory foreign language in both countries.
- (ii) In both countries, there is a new national strategy and proposed measures to better exploit the potential of Information and Communication Technology (ICT) in education. These proposals aim at supporting all students and teachers in developing the digital skills they need to improve educational outcomes and to prepare students for an increasingly digitalized society.
- (iii) In both countries, there is increasing importance given to the use of digital tools in schools. The PISA (Program for International Student Assessment) results are also much debated in the two countries: this is a triennial international survey which aims to

evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students. Even though Sweden is far ahead in the use of the Internet and computers, the PISA test in 2015 showed that Swedish students performed poorly (Skolverket, 2015).

Recently, Swedish school authorities have suggested a new national strategy to better exploit the potential of ICT in schools (Skolverket, 2016). The strategy contains proposed measures aimed at supporting all students and teachers in developing the digital skills they need to improve educational outcomes and to prepare students for an increasingly digitalized society. For a number of years now, every student in Sweden receives a laptop from their school. In 2016, the German government also declared digital education a priority in its National Digital Agenda (cf. Burchard et al., 2016). Compared to the situation in Sweden, German students do not get a computer from their school and their exposure to English outside school is more limited than in Sweden, where English is even considered to be a 'second' and not a foreign language. In Germany, the authorities are still working on getting better internet and broadband provision in the countryside and in schools. Although Sweden is far ahead of Germany in the use of computers in education, teachers' lack of training in using digital media has been reported in Sweden as well (cf. Gagnestam et al., 2010; Fredholm, 2016).

The use of digital technology for languages also has a direct implication for the creative industries, which work primarily with languages for teaching and learning. Rosenberg (2010) emphasizes the learner as a creative resource providing teachers with an unending source of ideas and study material. Co-Creation between teachers and learners can be promoted through knowledge about motivators, de-motivators, perceptions and attitudes towards digital technology as tools in language classrooms. In a study that sought to understand teachers' attitudes towards computers, it was demonstrated that such attitudes are directly related to the extent and importance attached to using technology in a classroom setting (Zhao, Tan & Mishra, 2001; Teo, 2006; Teo, 2008). Since most teachers associate computers with tasks such as student management and communication with parents, the success of using technology for teaching a particular subject is largely dependent on how open the teacher is towards adapting to the technology and the digital tools. "Gaining an appreciation of the teachers' attitudes towards computer use may provide useful insights into technology integration and acceptance and usage of technology in teaching and learning" (Teo, 2008, pp. 413). It is also essential to create more situations in which the learners (and the teachers) can contribute to, initiate, control and create what happens in the classroom (Deller, 1990). In a commercial context, the need to collaborate with users and providers of language learning and teaching is also evident in the rapid growth of the Education Technology sector (EdTech) and

plays an important role in enhancing further EdTech entrepreneurial innovation.

The purpose of our pilot study is to compare how the use of digital tools in language teaching differs between Sweden and Germany and to compare the attitudes of students and teachers towards digital tools. In accordance with Rosenberg (2010) and the key competences, stated by the European Commission (2010), this pilot study presents the initial results from interviews with teachers and questionnaires among students in the two countries.

Following the results of the pilot study, the next step will be to increase the number of informants and involve local entrepreneurs in the creation and management of digital tools for language learning. The authors believe that a collaborative approach between teachers, students and entrepreneurs will provide an effective means to enhance the effectiveness and applicability of digital media for language learning. Collaborative activity can boost entrepreneurial involvement and interest in the creative industries especially among entrepreneurs in the Education Technology (EdTech) sector.

Hypothesis and research questions in the pilot study

The hypothesis of this pilot study is that there will be differences in the overall treatment of and attitudes to digital tools between the students and teachers and also between the two countries. It is of interest to better understand the nature of the existing gaps between the two clusters, given the increasing importance of digitalization in schools. Identification of existing gaps can be used as a premise to motivate a collaborative process whereby a better environment for digital learning of languages can be built. We assume that students from different cultures might convey different emotions, motivation and experiences that could also add immense value when integrated into the learning process.

Our research questions are:

- How does the use of digital tools in language teaching differ between the two countries?
- How do the attitudes to digital tools between students and teachers differ between the two countries?

Background

The use of digital tools in Sweden and Germany

When Sweden and Germany are compared, the situation concerning digitalization and the status of English differ (cf. Burchard et al. 2016). In Sweden, a survey of adults' and young people's computer usage showed that "69% of 9 to 14-year-olds used the computer for computer games in an average week" (Svensson, 2008, pp. 21). The findings of a study conducted by Sundqvist and Wikström (2015) "indicate a positive relation between gameplay and L2 English, at least for boys" (pp. 74). Their explanation for boys being better was that far fewer girls were gamers. Al-Jarf (2004) elaborated on the use of Web-based lessons to the effect that, when used as a supplement to classroom teaching, this was found to be more effective than traditional pedagogical methods that depend entirely on textbooks. Fredriksson (2011) showed in her pilot study of the use of computers in the classroom by Swedish upper secondary students that computers were used to a very small extent in teaching German as a foreign language, although the majority of the students were in favor of this. She also found a need for targeted educational efforts to change students' computer use and that both teachers and students should be involved in this process.

Although the German Federal Education Ministry decided in 2016 to invest in a five billion Euro program in digital education over the next five years (Tagesschau, 2016), there is an ongoing discussion whether every student really needs a laptop. The German Minister of Culture, interviewed in the German newspaper *Stuttgarter Zeitung*, says that "the technique must follow the pedagogy and not vice versa. [...] Replacing a book with a laptop or a tablet is no pedagogy. We still need scientific insights." (our translation) (Czimmer-Gauss, 2017). This discussion does not arise in Sweden.

Digital learning tools and enterprise-related learning

Also, newly added to the Swedish curriculum for the upper secondary school, is the key competence *entreprenörskap* i.e. enterprise related learning (Skolverket GY, 2015). Not much research has been done in this area so far. One exception is Otterborg's dissertation (2011) in which she examined students' different perceptions of entrepreneurial learning. Sixteen students at an upper secondary school who had a distinctly entrepreneurial profile were interviewed. Her findings demonstrated that upper secondary school students have different perceptions of entrepreneurial learning. Otterborg suggests that, if school is to use entrepreneurial learning as a learning approach, tasks should be retrieved from activities outside school to provide a greater challenge to students. This is also proposed by Leffler and Lundberg (2012), who write about the combination of enterprise-related learning and language learning. They consider that this is the right way to enhance motivation for learning languages.

They also refer to the European key competences for lifelong learning (ibid. pp.16). Learning should not be merely 'learning for school'. Since 2011 Swedish school authorities take the view that school should promote entrepreneurship, give students opportunities to develop new ideas and to work independently as well as with others (Skolverket 2011, Lgr 11:9). This goes hand-in-hand with language learning: in cooperation with others one develops language, finds motivation, makes guesses, takes risks and adopts different strategies. Leffler and Lundberg (2012) further suggest that cooperation with companies with regard to language learning may be an efficient case methodology in which international and cultural problems are solved by using a foreign language. In another study, a project financed by the Swedish Knowledge Foundation (*KK-stiftelsen*), interviews were conducted with lecturers and language learners at universities in Sweden (Gagnestam et al., 2010). One of their aims was to find out how these informants worked with digital tools in language learning. Their study showed that ICT in language teaching at university level was employed only to a small extent (mainly in distance learning). Surprisingly, the teachers were more positive towards it than the students, even though all of the students used a computer in their spare time. Access to computers and computing support are good at Swedish universities and the problem is in fact the lack of time for using digital tools in language teaching. The teachers also reported a lack of training in the use of technology and digital learning tools. There is a clear need for education in the use of digital learning tools in language teaching. The students also emphasized that the teacher is very important in language teaching. The computer is only regarded as a supplementary learning aid (Gagnestam et al. 2010, pp. 46 ff).

The field of commercial relevance that is most closely associated with this issue is Education Technology. Commonly referred to as EdTech, it is defined as "the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" (Robinson, Molenda & Rezabek, 2008, pp. 15). According to Statista (2017), the market size of the global languages services industry has doubled from 24 to nearly 42 billion USD in 2016 and it is expected to grow to almost 46 billion USD by 2020. In 2009, the United States topped the list of global language services providers, followed by Japan, Sweden and the UK in competition with each other. In Europe, the market size of the European languages services market has been projected to grow to nearly 28,000 million USD with the biggest cluster in northern Europe. These statistics give an insight into the growing base of digital entrepreneurship in the languages and the EdTech sector. In an article in the online version of Forbes magazine (2017) author Barbara Kurshan discusses EdTech entrepreneurs' interest in and efforts to enhance language learning, stating that recent developments in social networking, voice recognition and computer cameras have expanded the means to enhance language learning. By giving the learners the opportunity to

learn languages at their own pace, with technological support and based on their feedback, this has entirely changed the way in which languages are approached as subjects in schools and universities. However, there is very little information in terms of measurable impacts to measure how technological tools affect language learning. There is therefore huge scope for entrepreneurs to develop this field and innovate. Recent examples of language learning technologies are either online tools or embedded systems in preformed language learning environments. For example, the app Duolingo uses gamification as a tool for language acquisition and learning, while the language learning app Babble uses the online language learning platform to focus on conversations (Kurshan, 2017). It is believed that, given the work that still remains to be done in this field, digital entrepreneurs will realize the unexplored potential of the field and venture to create more efficient, technologically robust and user-friendly systems for language learning.

Research framework

The following holistic research framework is used to connect the various elements of the study into one larger frame (see Figure 1). It is expected that these stakeholders will benefit from the co-creative and collaborative activities between teachers and students.

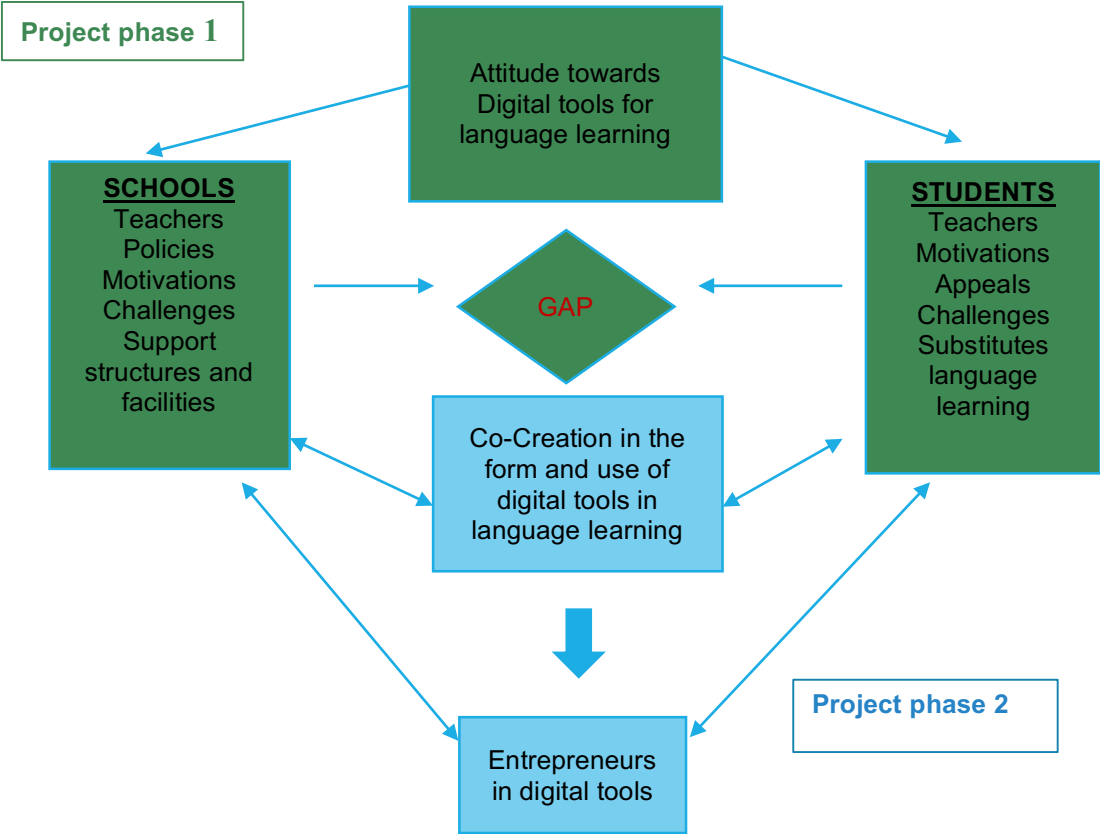


Figure 1: Research framework

Methodology and informants

Attitudes towards digital technology for learning languages were investigated among both teachers and students in Germany and Sweden. The teachers' responses about the use of digital tools, their motivations, challenges and associated support systems in digital pedagogy was assessed among 9 teachers of English aged 27-51 in Sweden and 7 aged 26-56 in Germany. The students' responses about the use of and attitudes to digital media for learning English were assessed using questionnaires, with responses gathered from 15 Swedish and 40 German students. All student respondents were from Grade 6.

The investigation was conducted in two stages: a survey and a group-specific task. In the first stage, a survey was carried out asking both teachers and students about the time they spent on computers or iPads and the reasons for using them. The questionnaire was structured around the following parameters:

- (i) The use of computers or iPads at home;
- (ii) The use of computers or iPads in school;
- (iii) The use of digital tools for learning English.

In the second stage, each cluster was given a group-specific task. The teachers were asked to rank the four parameters given below on a 5 point Likert scale. Teachers' feelings, knowledge and attitudes influence their use of ICT in teaching (Buabeng-Andoh, 2012; Teo 2008). In the interviews with the teachers, we employed the following parameters:

1. Affective component
2. Perceived usefulness
3. Perceived control
4. Behavioral intention when using digital tools for English language teaching.

The group-specific task for students included an evaluation of an English language learning game (a digital learning tool for English) as a controlled variable to test the students' attitudes towards the use of a digital learning tool.

Limitations: the research was restricted to Grade 6 students in various classes in both Sweden and Germany, a factor which could influence the connection between the responses of teachers and students. Moreover, it was not possible to obtain an equal number of teachers and students in order to ensure uniformity in sampling. As this is a pilot study we have a lower number of participants, which of course influences the level of generalization.

Results

In this study, we focus on the following elements of our research framework:

- (i) German teachers and German students (surveys, group-specific tasks and interviews)
- (ii) Swedish teachers and Swedish students (surveys, group-specific tasks and interviews)
- (iii) Overall comparison by country between students and teachers and gap analysis

The objective is to obtain the metrics for the gap analysis and illustrate the factors on which attitudes for the parameters under examination differ between the teachers and the students, as a comparative study of Sweden and Germany.

1. Responses from German teachers and students

a) Surveys

The first component of the survey was based on the following five questions seeking to examine the frequency and use of computers and iPads among teachers and students and also to understand the overall usability of the digital tools for language learning. The results are presented after each question in Tables 1-5 below.

Table 1. How often do you use a computer/an iPad at home per week?

	Less than 1 h	1-3 h	3-5 h	5-10 h	10-15 h	15-20 h	More than 20 h
40 Ger students	18 % (7)	23 % (9)	15 % (6)	13 % (5)	5% (2)	10 % (4)	?
7 Ger teachers	0	14 % (1)	0	14 % (1)	29 % (2)	29 % (2)	14 % (1)

Table 2. When do you use a computer at home?

	Watch films	Watch YouTube	Listen to music	Read online books	Play games	Learn words	Chat with friends	Do/plan homework	Learn lang.	Other
40 Ger students	33 % (13)	78 % (31)	45 % (18)	0	75 % (30)	5% (2)	30 % (12)	35 % (14)	2,5% (1)	5% (2)
7 Ger teachers	86 % (6)	71 % (5)	43% (3)	29 % (2)	43% (3)	0	57 % (4)	100 % (7)	0	0

Table 3. How often do you use a computer or iPad in school per week?

	Less than 1 h	1-3 h	3-5 h	5-10 h	10-15 h	15-20 h	More than 20 h
40 Ger students	43% (17)	52% (21)	2,5% (1)	0	0	2,5% (1)	0
7 Ger teachers	43% (3)	14% (1)	14% (1)	0	14% (1)	14% (1)	0

Table 4. Are you used to working with a computer for language learning?

	YES	NO
40 Ger students	7 % (3)	93 % (37)
7 Ger teachers	57 % (4)	43 % (3)

Table 5. If yes, how, when?

	Learning words	Writing texts	Talking to other people (chat)	Reading texts	Listening to texts	Watching films
40 Ger students	2,5% (1)	28 % (11)	2,5% (1)	2,5% (1)	2,5% (1)	0
7 Ger teachers	43% (3)	43% (3)	0	29 % (2)	57 % (4)	71 % (5)

As can be seen from the results, most students use a computer or an iPad for about 3 hours per week, whereas the teachers do so for almost 10 to 20 hours. Most students watch YouTube videos or play games while the teachers watch movies or plan their schoolwork. Most students spend about 1 to 3 hours per week using a computer or an iPad in school, whereas the teachers spend less than an hour. When asked if they used the computers for language learning, a 93% majority of the students replied negatively, whereas 50% of the teachers claimed that they use the tools for language teaching. The remaining students who replied positively use digital tools to write English texts while teachers use them mainly to show films in class, followed by listening comprehension exercises, and for teaching vocabulary and composing texts.

b) Group-specific task for teachers

For this task, we used a 5 point Likert scale ranking using four parameters; Affective component (AFF), Perceived Usefulness (PU), Perceived Control (PC) and Behavioral Intention (BI) (Teo, 2008). It was found that the German teachers were very positive in the AFF component, meaning that they did not feel uncomfortable if they made mistakes or were uncertain about how to use the technology and the digital tools. They were ready to learn how to use and employ it in their classrooms when required. The PU was high, meaning that the teachers were very positive about the perceived usefulness of the digital tools for language teaching. They believed that these tools could help them to improve work, make it more productive and also increase motivation in the class. The Perceived Control (PC) was high, meaning that the teachers were confident that they could learn the use of the digital tools by themselves and could solve technical problems with none or very little help from experienced users and technologists. Finally, concerning Behavioral intention (BI), it was observed that all teachers intended to use the tool in the future even though it was not mandatory for them to do so. It was also observed that although gender had no impact upon the responses received, age had an impact on factors such as the Affective Component and Perceived Control, implying that the teachers became less confident with age in the use of digital tools and their own confidence in incorporating it into classroom teaching.

c) Interviews with German teachers

The interview focused on 5 questions about the advantages of using computers in language teaching, in-service teacher training, digital tools used in class and related challenges. The German teachers talked about problems connected with infrastructure, quality of computers, Wi-Fi, battery life etc. At the same time, all of them were positive about the use of digital tools and believe that it would increase the quality of their teaching and their productivity. One of them said that *"A computer gives me the chance to offer a lot of different input to my students. It also helps me to prepare more interesting lessons and is a useful tool to save a lot of time."* They wanted to have more interactive whiteboards, iPads and digital (interactive) textbooks and workbooks. When asked about in-service teacher training, all of them said that they had had no training whatsoever in handling digital technology as a teaching tool. We then asked what digital learning tools they used when teaching English. Three answered a CD-player, three answered a laptop and projector and two answered an iPad or tablet PC and projector. One said a DVD-player and TV. Nobody mentioned any specific digital learning tools for language teaching. Some teachers showed less inclination to use digital tools by saying that *"I have to leave my English classroom and often the computers don't work correctly. It costs a lot of extra time to use them."*

d) Group specific tasks for German students

The German students were asked to evaluate a digital learning tool by using an English learning game provided to them by the researchers. When asked what they liked about the English game, a 45% majority of the students said "Nothing" while an equal majority found that the game was fun. Only 18% of the students thought that the game could teach them English. When asked if the game made their English better, 25% of the students replied that it did not help at all, while an equal 25% thought that they could learn a few new words. 13% of the students could not play the game at all. Some students also pointed out that the game *"did not have any German translation"* and so they could not connect with it.

2. Responses from Swedish teachers and students

a) Surveys

Similar to the German sample, this first component of the survey was based on the same five questions to find out about the use of computers or iPads by teachers and students in order to understand the overall usability of digital tools for language learning. The results are presented after each question in Tables 6-10 below.

Table 6. How often do you use a computer or iPad at home per week?

	Less than 1 h	1-3 h	3-5 h	5-10 h	10-15 h	15-20 h	More than 20 h
15 Swe students	0	13 % (2)	20 % (3)	27 % (4)	20 % (3)	0	20 % (3)
9 Swe teachers	0	33 % (3)	11 % (1)	33 % (3)	0	11 % (1)	11 % (1)

Table 7. When do you use a computer at home?

	Watch films	Watch YouTube	Listen to music	Read online books	Play games	Learn words	Chat with friends	Do/ plan home-work	Learn lang.	Other
15 Swe students	33 % (5)	80 % (12)	66 % (10)	7 % (1)	93 % (14)	0	87 % (13)	80 % (12)	13 % (2)	7 % (1)
9 Swe teachers	78 % (7)	78 % (7)	89 % (8)	0	11 % (1)	22 % (2)	55 % (5)	78 % (7)	0	45 % (4)

Table 8. How often do you use a computer or iPad in school per week?

	Less than 1 h	1-3 h	3-5 h	5-10 h	10-15 h	15-20 h	More than 20 h
15 Swe students	0	13 % (2)	0	27 % (4)	20 % (3)	20 % (3)	20 % (3)
9 Swe teachers	11 % (1)	11 % (1)	0	45 % (4)	11 % (1)	0	22 % (2)

Table 9. Are you used to working with a computer for language learning?

	YES	NO
15 Swe students	40 % (6)	60 % (9)
9 Swe teachers	89 % (8)	11 % (1)

Table 10. If yes, how, when?

	Learning words	Writing texts	Talking to other people (chat)	Reading texts	Listening to texts	Watching films
15 Swe students	33 % (5)	40 % (6)	20 % (3)	33 % (5)	20 % (3)	0
9 Swe teachers	100 % (9)	89 % (8)	33 % (3)	89 % (8)	100 % (9)	100 % (9)

Most students used the computer or iPad for 5–10 hours per week, three teachers for 1–3 hours and three others for 5–10 hours. Most students used it to play games, chat with friends, do their homework and watch YouTube videos, while the teachers used it mainly for music, watching films or for planning their teaching. Most students used computers or an iPad in school for more than 15 hours per week, whereas the majority of the teachers used it for 5–10 hours. When asked if they used the computers for language learning, 60% of the students replied negatively, whereas 89% of the teachers claimed that they used the tools for language teaching. The students who replied positively mainly used digital tools to write and read English texts. The teachers used their computer or iPad for all of the above purposes except for chatting.

b) Group-specific task for teachers

In this task, the same Likert scale was used as in the group task for the German teachers (Teo, 2008). For the Affective component (AFF) it was found that 80% of the Swedish teachers who were interviewed strongly disagreed that they had any hesitation in using digital technology in

language classrooms. They said that they would not feel uncomfortable making mistakes with the digital tools. For the Perceived usefulness (PU) component it was found that approximately 90% of the Swedish teachers strongly agreed about the usefulness of digital tools in the language classroom with a strong belief that these tools would contribute to improving work and motivation. The results for the Perceived Control component (PC) were divided. When asked if they could learn about the tools by themselves, 50% of them disagreed, while the rest agreed. When asked if they could solve problems related to the technology, they replied positively. They also disagreed that they required help from experienced users with the technology. The Behavioral Intention (BI) is very high and all of the participants were highly positive about working with digital learning tools in the future. Age and gender did not make any difference to the responses of the Swedish teachers.

c) Interviews with Swedish teachers

The teachers were positive about using digital tools. The advantages they listed were variation, productivity, listening abilities, movies and students recording themselves and using vlogs. The disadvantages were networks problems, overload and battery life. They felt that iPads were better. Only some of the teachers had had training in handling digital technology as a teaching tool. *"We learned to open an iPad and start apps"* and *"I went on a short course 10 years ago"* were typical responses from the Swedish teachers. We then asked what digital learning tools they used when teaching English and they made a number of suggestions, e.g. Oxford OWL, News in levels, Online books, Puppet Pals, Glosboken, UR.se, Kahoot and Legimus.

d) Group-specific task for Swedish students

The Swedish students were asked to evaluate a digital learning tool by using an English learning game provided to them by the researchers. When asked what they liked about the English game, a 67% majority of the students felt that the game was only *"fun in the beginning"* while 33% of the students thought that the game *"was more suitable for children aged 5–7 years"*. An 86% majority of the students were very positive overall about the application of the English game for language learning and they said that the game had taught them new words, new meanings and that they had also got better at listening to English.

Overall comparison by country between students and teachers and a gap analysis

The situation in Sweden regarding the use of technology and digital learning tools is much better than in Germany. The Swedish teachers use a variety of tools such as interactive whiteboards, iPads etc. for English teaching. Software such as Road to Grammar, interactive textbooks and workbooks are also actively employed. Even so, neither country has employed

the use of games for language teaching and there also seems to be a tendency to negative attitudes to gamification. Teachers want to keep track, give formative and summative feedback and individualize learning, but many digital learning tools do not support this. Different attitudes among our informants arise from a difference in levels of experience between teachers and students and between the two countries. Whereas the Swedish teachers use a variety of tools, in Germany there is a lack of access to computers as well as to digital learning tools. There is a lack of in-service training for teachers in both countries as well. The connection between users and developers seems to be weak, which is something that needs to be considered in the future. Many teachers said *"If I could decide ..., I would wish..."* in connection with the application of digital tools inside the language classroom. Overall, the teachers showed a positive attitude towards the application of digital tools and there is considerable scope for using it in language pedagogy if strategic steps are taken to encourage positive attitudes and provide relevant in-service training to boost motivation.

The attitudes of the students differed about using the English learning game. While German students' responses were mixed, Swedish students wanted more challenges. One explanation might be that Swedish students used computers or iPads to a greater extent at home and in school than German students.

Table 11. Comparison of attitudes to the use of digital tools for language learning

Swedish students (15)	German students (40)
40 % of the students do not want to use digital tools for language learning	75 % of the students do not want to use digital tools for language learning
60 % are not used to working with digital tools for language learning	93 % have never used digital tools for language learning
20 % think they learn English better by using a book	70 % think they learn English better by using a book
93 % have a computer at home	100 % have a computer at home
93 % have an iPad at home	22 % have an iPad at home

The majority of the German students had never used digital tools for language learning and they were also convinced that they would learn English better by using a book. Although there are differences in attitude between the student clusters by country, it is clear overall that there is still scope for bringing digital tools into the language classroom.

Conclusions

Our results show that Sweden is a long way ahead in the use of digital devices and digital learning tools in education, but it is no advantage having a lot of digital learning tools if one is not a good teacher. Sweden has the technical equipment but it is not used optimally due to a lack of in-service teacher training. This is related to the worry expressed by the German Minister of Education, "replacing a book by a laptop or a tablet is not pedagogy" (see introduction). We should also bear in mind that the PISA results in Germany were better than those in Sweden. The students whose use of the Internet and computers is highest both in and out of school perform worst in the PISA test (see Skolverket 2015, PISA). This throws into doubt the sustainability and economic business model of the local municipalities in investing in making schools digital. Huge investments in schools through smart boards and other interactive tools are a waste in the absence of empowering teachers to use them.

Future research

This research seeks to create a model for co-creation between students, teachers and entrepreneurs such as ICT companies as the next step in this exploratory study. We see it as a viable solution to work towards strengthening the national strategies, exploit the potential of ICT, enhance digital competence and enhance entrepreneurship in education (European Commission 2010; Skolverket, 2016). In a follow-up study to the results from the pilot, the number of informants in both countries will be increased. Local entrepreneurs in the business of digital tools for language learning will also be involved, since cooperation between users and producers will help in designing more efficient digital learning tools, which, in turn, will contribute to better learning results.

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