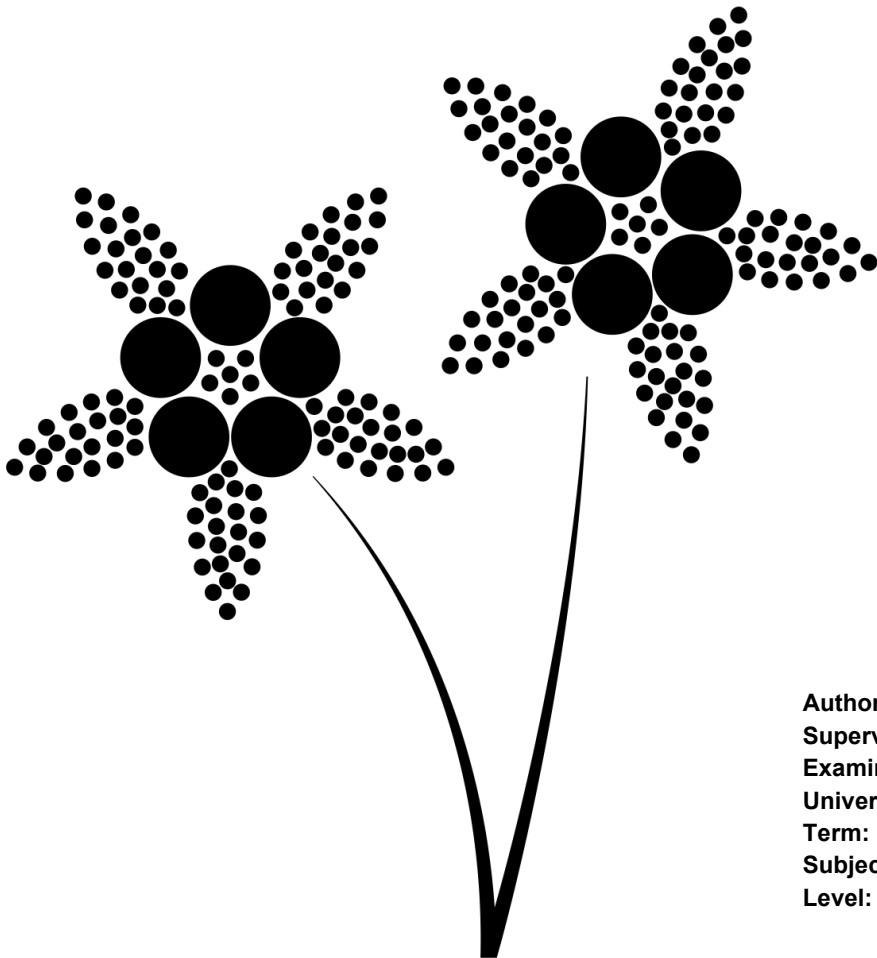


Digital Tools in English Language Learning

A systematic literature review of teachers' perceptions



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Abstract

The use of digital tools in the English as a foreign language (EFL) classroom has increased dramatically over the last decades. Even though digital tools have been used in English language learning since the 1980s, the rapid development of new technology and recent demands in curriculum for digitalisation has increased the need for digital competence among teachers. This study presents a systematic literature review exploring teachers' perceptions of the use of digital tools in the EFL classroom, and the teachers' perceptions of their own competence to use digital tools in teaching. Peer-reviewed articles on EFL in Nordic countries published between 2010-2025 on Educational Resources Information Centre (ERIC) and Linguistics and Language Behaviour Abstracts (LLBA) were identified and analysed using thematic analysis. The findings indicate that teachers' perceptions of digital tools in EFL classrooms are primarily positive and digital tools are seen as valuable and providing opportunities through increased engagement, authenticity, multimodality and ability to individually adapt content. Digital tools are mostly perceived as a complement to traditional methods rather than a replacement. Furthermore, digital tools can also affect the teacher's role in the classroom and support more student-centred learning. However, these positive perceptions depend on teachers receiving sufficient time and support in learning how to effectively use these tools. Teachers perceive that digital tools are not inherently enhancing the learning in the classroom but become valuable through reflection and careful pedagogical design. The main challenges to integrate digital tools were perceived to be time constraints, practical digital competence and challenges with less autonomous groups. Teachers own digital competence is perceived as limited but improvable. Many teachers perceive themselves to have basic technological knowledge. However, teachers also express a lack of technological knowledge to use digital tool in more advanced collaborative and multimodal learning in online or hybrid spaces, in practice. To keep up with the demands of the rapid digitalisation, teachers perceive a need for professional development and time for practice, collegial learning, supervised projects and positive experiences.

Keywords

ESL, English as a second language, EFL, English as a foreign language, English language learning, ICT, information and communication technology, CALL, Computer assisted language learning, Digital tools, digital tool, AI, Artificial intelligence, Nordic countries

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1 Introduction

Technology is continuously progressing and changing the way in which we acquire and share information. Digital devices and tools are becoming more prevalent in our daily lives both inside and outside of school. Computers, projectors and an internet connection have become a norm in Swedish classrooms. A study conducted by the Swedish National Agency for Education in 2016 showed that availability and use of digital tools are increasing in schools. More and more schools are also choosing to provide students with personal digital tools. However, students' access to digital tools is not evenly distributed (Skolverket, 2018:15). In elementary school, the so-called 1:1 initiative provides just over a quarter of all students in Sweden with a personal computer or tablet (Skolverket, 2018:15). The same figure for upper secondary school is more than three quarters of all students (Skolverket, 2018:15). In addition, three out of four schools equip every classroom with a projector (Skolverket 2016:3). Schools are using learning management systems for communication between teachers, students and parents (Skolverket, 2018:17). Moreover, teachers spend a large part of their working hours for documentation and administration in different digital systems, which leaves less time to actually engage with students (Skolverket, 2018:23). In addition, teacher also express that learning to use new tools, and finding or creating digital material is time consuming (Skolverket, 2018:54-55;63). The enhanced focus on digital competence in schools has also led to changes in the syllabus for many subjects, with an increased focus on digital literacy. In addition, starting in 2024, the nationwide standardized national tests will be digitalised, claiming to make it more effective, user friendly and secure. Although the English syllabus has not been affected in any major way by these changes, use of digital tools can already be found in its aim and core content.

Years 7-9:

- “Spoken English, including regional and sociolectal variation, and texts, from different media”
- “Literature and other fiction, including audio and films.”
- “Searching and evaluating the content of oral and written sources of various kinds, for different purposes.”

(Skolverket 2024A)

There are many benefits of using computers in our classrooms. When used correctly they can make the teaching more engaging, personalized, help students find information and provide tools for students with diverse needs (Skolverket, 2018:57-60). New technologies and digital tools can facilitate and help make our teaching more dynamic, but they can also be a distraction if used in inappropriate ways (Skolverket, 2018:56-57). Two thirds of all teachers believe that the work in the classroom is interrupted on a daily basis by the use of text messages, social media and games (Skolverket, 2016:11). Moreover, 50% of the teachers in Swedish secondary and upper secondary schools state that they need training on how to use IT as a pedagogical tool. The use of digital tools has also been under scrutiny on a governmental level, and in 2023 the Swedish government announced that they do not intend to proceed with the digitalisation strategy presented by Skolverket in 2022 (Skolverket, 2024B). The Swedish Minister of Education at the time, Lotta Edholm, stated that there has been an uncritical attitude towards digitalisation in schools, and that a physical book has advantages that no ipad can replace. Thus, the government will once again make investments in traditional teaching aids (Regeringskansliet, 2022)

Furthermore, computer assisted language learning (CALL) has been a part of English language learning since the 1980's (Dudeney & Hockly, 2012:534). Since then, the technology has developed rapidly from basic word processing to the connected internet and artificial intelligence tools we have today. These new tools present the teachers with a lot of possibilities but also challenges.

Consequently, digital tools can be useful, but teachers need to be critical to how we use it and when. Teachers in the future classroom will need digital competence not only to create a successful learning environment, but also to mentor their students in their development. In light of this, it is of great interest to explore what current research tells us about English as a foreign language (EFL) teachers' attitude toward the use of digital tools in their classroom education. To achieve this overview a systematic literature review will be conducted.

1.1 Aim and research questions

The aim of this literature review is to present what current research tells us about EFL teachers' perception toward the use of digital tools in their education. The scope of the study will be specifically on Nordic countries as digital tools have been prevalent in the Nordic school context with 1:1 computers and internet for well over a decade.

Research questions:

1. What perceptions do EFL teachers have towards the use of digital tools in the classroom?
2. What perceptions do EFL teachers have of their own competence to use digital tools in an effective way?

2 Theoretical background

This section covers the history of the use of digital tools in EFL teaching. Some important terminology and concepts which are useful to understand ICT use within a pedagogical setting are then examined.

2.1 History and future of technology in the ELT classroom

The use of computers in English language teaching is not a new phenomenon. However, the advent of new technology and increased accessibility of digital tools have made computers a more integral part of how we learn in the modern classroom. Dudeney and Hockly (2012:534) explain that computer-assisted language learning (CALL) started to gain traction in language education around the 1980s. Better and more affordable hardware allowed for the implementation of computers in education, which led educational institutions to invest in computer labs (Dudeney & Hockly 2012:534). The CALL era would stretch up until the late 1990s. During this time, computers were used for basic word processing and gap-filling exercises, while feedback and meaningful interactions were limited (Dudeney & Hockly 2012:533-534).

The first major change would come in the late 1990s when the internet became more widely accessible. The internet increased the potential of using computers in education as it became a source of knowledge and communication. Websites started to appear for teachers which provided resources for teaching and a place for discussion about teaching (Dudeney & Hockly 2012:536-537). The next big step in technological development was the arrival of what is referred to as web 2.0. Web 2.0 transformed the web from a static, expert-produced resource to a creative consumer-driven space. The shift into web 2.0 meant that the internet became more accessible to the general public and no programming or design skills were needed to produce resources (Dudeney & Hockly 2012:538).

The final piece which radically changed the way technology is used in teaching was the rise of social networks. The social web has allowed teachers to join larger conversations about teaching and facilitated sharing of knowledge. In addition, new and improved electronic devices and new technology have made it faster and easier to access this world of knowledge (Dudeney & Hockly 2012:539). Dudeney and Hockly (2012:541-542) conclude by saying that the advancements in technology have vastly impacted the way we teach languages. Web 2.0 and new

digital tools allow teachers and learners to take part in a wide variety of learning materials both inside and outside of school. The role of the teacher has remained similar throughout these changes, as that of a guide who provides students with materials. However, today the amount of material available to choose from is much larger than it has been previously (Dudeney & Hockly 2012:542).

2.2 Theoretical background

Part of the problem of implementing technology in teaching is that technological knowledge is viewed as a separate skill (Mishra and Koehler, 2006:1029).

Teaching is a complex activity which requires teachers to make use of several different skills and to have knowledge within different areas. One framework which can be used to understand digital competence within the field of education is technological, pedagogical, content knowledge (TPCK). To achieve successful teaching, teachers need to thoughtfully interweave their technological, pedagogical and content knowledge (Mishra & Koehler 2006:1029). Furthermore, simply providing teachers with ICT tools through workshops does not equal that the teachers will be able to use these tools in their teaching. With the rapid development of technology, teachers need a deeper understanding of how technology relates to content and pedagogy in the dynamic contexts we face in school practice (Mishra & Koehler, 2006:1031).

The TPCK model includes three core types of knowledge. When paired or grouped up, these types of knowledge create new types of knowledge. Below is a short summary of the key components of the model. *Content knowledge* can briefly be described as a teachers' knowledge about the subject that is being learned or taught. This includes facts, concepts and theories relevant to the subject (Mishra & Koehler, 2006:1026). *Pedagogical knowledge* is knowledge about how teaching and learning can happen. It includes knowledge about methods to be used in the classroom, understanding the target audience, strategies for checking for student understanding and assessment. *Technology knowledge* (TK) is about

understanding and using technology, both traditional and new digital tools. *Pedagogical content knowledge* (PCK) is knowledge about how to teach certain content, and what methods and approaches will make the content easiest to learn. *Technological content knowledge* (TCK) is knowledge about the relation between technology and content, and how the subject being taught can be changed by the application of technology. *Technological pedagogical knowledge* (TPK) is knowing what technology exists and which technology is best suited to specific tasks. It is also about knowing how teaching methods change when we introduce technology. *Technological pedagogical content knowledge* (TPCK) is the result of integrating all these knowledge areas: content, pedagogy and technology. To create good and meaningful content, teachers must consider all these types of knowledge and how they relate and affect each other in a specific context (Mishra & Koehler, 2006:1028-1030). Below is a recreated visualization of the TPCK framework which shows how the different types of knowledge overlap and integrate to create new knowledge areas.

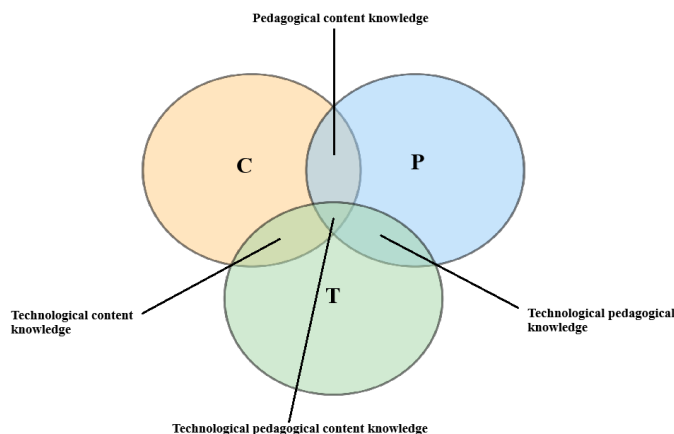


Figure 1. A recreated visualization of the model described by Mishra & Koehler (2006). Three different kinds of knowledge (C: content, P: pedagogy, T: technology) which in turn create more types of knowledge where the circles interlock.

The categories of the TPCK framework will be used to shed light on how the teachers understand the notion of digital competence. In this literature review, TPCK will assist in discussing teachers' own perceived digital competence.

3 Data collection

The method chosen for this study is a systematic literature review (SLR). The reason this method was chosen was because SLR is a method well suited to investigate specific topics where a considerable amount of previous research already exists (Denscombe, 2021:203). The SLR will be useful to get an overview of the already existing knowledge, while minimizing bias through its structured and transparent methodology. Even though the topic of digital competence in education has been in the spotlight for a while, it does not entail that the findings are uncomplicated or unambiguous. This is because most fields of research have disputed areas, and moreover, claims can be based on sources of varying quality (Denscombe, 2021:202). By using an SLR, the risk of contradictory or even distorted findings can be reduced, as a result of being systematic and transparent in the search and selection of sources (Denscombe, 2021:203). In an effort to exercise said transparency the data collection will be described in detail below.

The first step of the data collection process was to specify the scope of the study. In order to be able to compare the findings from previous research, it is important that the studies are based on the same prerequisites (Denscombe, 2021:203). This common context is also described by Cho and Lee (2014) as transferability. In order to collect comparable data, the scope of this study was limited to English language education in Nordic schools after 2010 and onwards.

The second step in the data collection was to select a database which included relevant articles. After browsing the databases available at the university library, Educational Resources Information Center (ERIC) and Linguistics and Language Behavior Abstracts (LLBA) were chosen. In order to identify relevant keywords, the university library was consulted. After performing some initial searches and reading a selection of previous research articles, a few more keywords were identified. As this study focuses on the use of technology the keywords ICT OR “information and communication technology” OR CALL OR “Computer assisted

language learning” OR “Digital tools” OR “digital tool” OR AI OR “Artificial intelligence” were used. In addition, ESL, “English as a second language” OR EFL OR “English as a foreign language” OR “English language learning” were used as keywords to emphasise the focus on the use in English language learning. Finally, Sweden OR Swedish OR Denmark OR Danish OR Norway OR Norwegian OR Finland OR Finnish OR Iceland OR Icelandic were used to stress the interest in the Nordic context. The articles were then filtered to only include peer reviewed scholarly journals. These searches were conducted on 2025-10-29.

Once the potential articles for the study had been identified, they were downloaded and uploaded to Covidence. Covidence is an online platform which helps streamline the process of conducting systematic reviews, from screening to data extraction and quality assessment. At this first stage, a total of 88 articles were found. These articles were imported to Covidence for screening and further selection. In the initial screening, 10 articles were removed as they were identified as duplicates. The remaining 75 articles moved on to title and abstract screening where another 59 articles were removed as they did not focus on education, did not focus on Nordic countries, did not focus on use of digital tools, ICT or CALL or were otherwise deemed to be irrelevant to the research questions. A total of 19 articles were reviewed in full text where finally 10 articles were selected for the literature review. The articles removed at this final stage were considered to have a too narrow focus on teachers’ perceptions or focusing on ICT use outside of the classroom. Below is a table of the final articles selected.

Table 1. Selected articles for literature review

Author:	Title:	Published:	Country:	Method:
Allen, C	Conceptions of Personal Learning Environments Among EFL Teachers at Upper Secondary Level in Sweden	2013	Sweden	Qualitative interviews

Allen, C	Marriages of convenience? Teachers and coursebooks in the digital age	2015	Sweden	Qualitative questionnaire
Allen, C & Berggren, J	Digital literacy and sustainability – a field study in EFL teacher development	2016	Sweden	Qualitative observations and interviews
Cerratto Pargman, T., Nouri, J. & Milrad, M.	Taking an instrumental genesis lens: New insights into collaborative mobile learning	2018	Sweden	Qualitative & Quantitative, interviews and observations
Fransson, Holmberg, Lindberg & Olofsson	Digitalise and capitalise? Teachers' self-understanding in 21st-century teaching contexts	2019	Sweden	Qualitative interviews
Holmberg, Fransson & Fors	Teachers' pedagogical reasoning and reframing of practice in digital contexts	2018	Sweden	Qualitative interviews
June Fearn, J.	EFL teachers' perceptions of online community projects in secondary school education	2022	Sweden, Norway & Italy	Qualitative interviews & open ended questionnaires
Musk, N	Avoiding the Target Language with the Help of Google: Managing Language Choices in Gathering	2014	Sweden	Qualitative observations

	Information for EFL Project Work.			
Segaran, M. K., & Moltudal, S. H.	A Qualitative Descriptive Study of Teaches' Beliefs and Their Design Thinking Practices in Integrating an AI-Based Automated Feedback Tool	2025	Norway	Qualitative interviews
Tumelius, R. & Kuure, L	Pre-service teachers' professional vision and agency emerging in orchestrating language learning in a hybrid space	2024	Finland	Qualitative observations and interactions

The selected articles are all published after 2010 and based on research conducted in a Nordic school context. Furthermore, all the selected articles use a qualitative study design and are based on data consisting of observations, interviews and open-ended questionnaires.

4 Data analysis

The method used to analyse the data was thematic analysis. It was chosen as thematic analysis is a reliable method for dealing with qualitative data (Braun & Clarke, 2022:4). Furthermore, this type of qualitative content analysis offers the flexibility to use inductive data analysis, i.e. codes derived from the data set (Cho & Lee, 2014:4). Moreover, it enables examination of both explicit (manifest) and underlying (latent) meaning in the content (Cho & Lee, 2014:4). This means that the analysis includes both statements that directly express teachers' perceptions, and those revealing perceptions implicitly, by reading between the lines.

Thematic analysis is an approach used to examine a data set in order to identify, develop and interpret patterns. This requires a systematic process of coding data to develop themes (Braun & Clarke, 2022:4). These themes will then be the primary focus of the analysis. Throughout this process, it is important to consider that themes do not passively appear in the data but are produced by the researcher with everything they bring to the data set (Braun & Clarke, 2022:8). To produce good quality themes, the researcher must use reflexivity and work to understand and acknowledge their own perspective (Braun & Clarke, 2022:8). This was achieved by ongoing critical reflection of how my own assumptions shaped the interpretation of the data, as well as transparency in inclusion and exclusion decisions. In addition, to mitigate any bias, inductive coding was used and I let the codes emerge from the data rather than any pre-determined codes. It is worth noting that any analysis and interpretation of data cannot be completely objective, but it can be weaker i.e. underdeveloped and shallow, or stronger i.e. thoughtful and nuanced (Braun & Clarke, 2022:8). Reflexive practice entails critically interrogating what is done, how, why and the impacts of this on the study (Braun & Clarke, 2022:5).

The first step of the thematic analysis process was to thoroughly read through all the selected texts and get familiar with their content (Braun & Clarke, 2022:6). Once familiar with the data, the coding began. The coding procedure followed the process of thematic analysis as described by Cho and Lee (2014:11). For this analysis, inductive coding was used, and the unit of analysis selected for review was the results, discussion and conclusion sections of the articles. The texts were analysed one by one and excerpts of interest were underlined and assigned a code. At this stage, the codes were not yet clustered into any themes. When all articles were processed, the created codes were reviewed and grouped up into subthemes and themes.

What this meant in practice was that the articles were read with an open mind. Once a statement or excerpt that explicitly or implicitly could be connected to teachers' perceptions was encountered, it was highlighted. Once all articles were

examined, the highlighted excerpts were colour coded and clustered together into mind maps based on common sub-themes. The page references for the initial codes were saved so that I could easily come back to the source to avoid misinterpreting the data. I then revisited and revised the codes to make sure that they were correct and that no codes were missed. Finally, the sub-themes were clustered together into broader themes. For themes relating to teachers' digital competence (section 5.5), the TPACK model was used to understand what kind of competence the teachers expressed.

4.1 Research ethics

The study is conducted in accordance with the recommendations of the Swedish research council. It follows the ALLEA code's fundamental principles for good research practice: *Reliability*: The quality of the research is ensured through use of well-established and documented methods, analysis and use of sources. *Honesty*: The presentation of data, methods, results and interpretations are open and transparent. *Respect*: respect is shown towards any participants mentioned in the texts. *Accountability*: As the author I am accountable for the research from idea to publication (Swedish research council, 2024:11).

The data in this study has been collected, analysed and presented in an objective and honest manner in accordance with the openness interest. Methods, key words, databases, inclusion and exclusion criteria, sources and references are transparently published. The data used for the study are openly available and are findable, accessible, interoperable and reusable in accordance with the FAIR-principles (Swedish research council, 2024:87). To work ethically with scientific integrity entails an attempt to collect and analyse data in an objective and honest way (Denscombe, 2021:443). By practising reflexivity, I do not let any personal preferences or ideals affect the finding, but I attempt to present a balanced and unbiased interpretation of the findings. Even though no human participants are directly involved in this study, the data consists of peer reviewed studies involving human participants. To ensure that the anonymity of all participants in the studies remain intact, efforts have been made to ensure that any data involving

humans have been appropriately anonymized by the original authors to minimize any potential risks for participants (Swedish research council, 2024:59).

5 Results

In this section, the teachers’ perceptions of digital tools and their perceived competence to use digital tools are presented based on the findings from the selected articles. Sections 5.1–5.4 address themes relating to RQ1: *What perceptions do EFL teachers have towards the use of digital tools in the classroom?* Section 5.5 subsequently addresses themes relating to RQ2: *What perceptions do EFL teachers have of their own competence to use digital tools in an effective way?* The findings of this study are presented thematically, with each theme representing a perception held by teachers in the reviewed articles, as well as subthemes with related beliefs. It should be noted that not all perceptions highlighted in this section appear in each individual article. Rather, the themes reflect common patterns of meaning which were identified through the process of inductively coding the data set. The themes presented in this section are as follows:

Table 2. Themes and subthemes

Theme:	Subtheme:
EFL teachers’ perceptions of the role of digital tools in teaching	<p>Development of more positive perceptions through practice</p> <p>Perceptions of digital tools as complements rather than replacements for traditional teaching</p> <p>Recognition of the need for pedagogical redesign and design-oriented thinking</p>
Digital tools’ perceived effect on professional roles and teacher identity	<p>Perceived impact of digital tool use on professional roles</p> <p>The influence of prior experiences on teachers’ confidence and engagement with digital tools</p>

Perceived pedagogical benefits of digital tool use in EFL classrooms	<p>Enhanced authenticity and relevance</p> <p>Increased variety, flexibility and adaptability</p> <p>Improvements in learner engagement, motivation and autonomy</p>
Perceived challenges of digital tool use in EFL classrooms	<p>Time constraints as a barrier to effective digital integration</p> <p>Lack of practical technological knowledge</p> <p>Difficulty in supporting less autonomous or lower proficiency learners</p>
EFL teachers' perceptions of their own digital competence and requirements for developing it	<p>Perceptions of insufficient yet improvable digital competence</p> <p>Perceived importance of practice and collaboration in competence development</p> <p>Perceived need for targeted professional development</p>

5.1 EFL teachers' perceptions of the role of digital tools in teaching

One common theme in the articles is how teachers' beliefs and perceptions of digital tools evolve and change as they get familiar with using the tools. The initial implementation of new digital tools was often met with some degree of scepticism, which later shifted to appreciation. After using digital tools for a while and being able to experiment with them, many teachers viewed digital tools as valuable and pragmatic complements to traditional teaching methods.

5.1.1 Development of more positive perceptions through practice

The teachers participating in the studies included in this review often went from uncertainty and hesitation to curiosity and appreciation of how digital tools could be used to improve their teaching during the course of the research projects. This

transition in attitude is described as follows in Segaran and Moltudal's (2025) study of Norwegian lower-secondary school teachers' perceptions of an AI-based assessment tool:

All the teachers in this study had no prior experience with using an automated feedback tool. The teachers emphasized the importance of becoming familiar with the tool before feeling confident enough to integrate it into their teaching.

(Segaran & Moltudal, 2025:9)

Similarly, one of the interviewee's in Fearn's (2022) study of secondary school teachers' perceptions of online projects describes her increased confidence in using digital resources as follows:

I have learned to use digital tools and not be afraid of technology. The learning events and online seminars have also taught me many things that have improved my teaching, such as flipped classrooms, Inquiry-based learning etc. (Nora).

(Fearn, 2022:368)

While many teachers' can envision how a digital tool could be beneficial for their teaching, they lack the specific technological knowledge to implement it in a way which realizes their pedagogical intentions. After receiving guidance and time to experiment and reflect, many teachers shared positive views of how digital tools can add value to the classroom. Thus, we can see that teachers' perceptions towards digital tools are positive, but only after receiving guidance and time to learn how to use them in an effective way.

5.1.2 Perceptions of digital tools as complements rather than replacements for traditional teaching

While the perceptions of using digital tools are predominantly positive, most teachers are not willing to fully abandon traditional teaching methods. Instead, teachers use digital tools to enhance already established practice. This can be seen in the articles where many of the teachers use a combination of digital tools and traditional methods. Below is an example of how teachers balance digital tools and traditional teaching methods from the study by Segaran and Moltudal (2025):

Teachers in this study saw the potential of the tool to enhance teaching without overshadowing established practices. By reinforcing their existing strategies with technology, these teachers demonstrated the ability to bridge traditional and innovative approaches effectively.

(Segaran & Moltudal, 2025:13)

Another example of this can be observed in the study by Allen (2015). Here in-service teachers show positive perceptions for using digital material and tools in topic driven teaching, instead of coursebook centred teaching (Allen, 2015:257). Although they express the value of, and need for, authentic material provided by digital tools, they also express a lack of technological knowledge to rely solely on ICT as outlined below:

With the exception of one respondent in the PS group, neither group of teachers felt entirely confident in their ability to fully embrace a purely digital literacy-driven approach to the planning of individual lessons or as the balance for a syllabus.

(Allen, 2015:258)

The transition to a fully digital approach is primarily hindered by teachers' lack of technological knowledge to integrate more advanced web 2.0 resources (Allen, 2015:258-259). Hence, teachers' decision to use digital tools as an extension of traditional methods rather than a replacement is connected to their perceived digital competence.

5.1.3 Recognition of the need for pedagogical redesign and design-oriented thinking

Digital tools are not inherently effective; their impact depends largely on how teachers mediate and integrate them into the teaching. Successful integration requires teachers to have time to explore, create and evaluate digital resources as part of an ongoing pedagogical process. Moreover, digital artifacts are not perceived to be stand-alone solutions, rather their value is determined by how teachers adapt and transform them to suit specific classroom contexts as described in this excerpt from the study by Cerratto Pargman and colleagues (2018):

This study has illustrated that the tablet is not a collaborative device but rather that it emerges as a collaborative instrument through the establishment of the teachers' and learners' multiple instrumental mediations.

(Cerratto Pargman, et al., 2018:229)

The way in which teachers identify and define instructional problems, plan and prepare lessons, implement digital tools and assess their effectiveness determines whether learners are able to use these tools effectively (Segaran & Moltudal, 2025:12; Musk, 2014:130).

5.2 Digital tools' perceived effect on professional roles and teacher identity

Integrating digital tools into the classroom can have an effect on teachers' pedagogy, teacher role and the dynamics in the classroom. In addition, it can affect teachers' professional identity. For some teachers the use of digital tools can strengthen their confidence and motivation. At the same time other teachers perceive the digitalisation as stressful and as something which diminishes their motivation and confidence.

5.2.1 Perceived impact of digital tools use on professional roles

One common pattern in the articles is the view of students as active participants in the learning process, and to some extent responsible for their own learning. Many of the teachers in the articles who work with digital tools express a shift in the teaching role towards a more student-centred education with the teacher as a guide (Segaran & Moltudal, 2025:9; Tumelius & Kuure, 2024:1572). When working with, for example, automated feedback, the teachers are described to monitor and guide the students and assist when they encounter problems or information overload. An example of this is outlined in the Segaran and Moltudal's (2025) study where the teacher is described as a guide and mentor and part of a scaffolding process to help the learners develop agency:

The teacher's role was not only in guiding and mentoring the learning practices, but also viewed as a scaffolding process that helps learners to develop their agency.

(Segaran & Moltudal, 2025:13)

This shift to student centred learning methods does not mean that teachers are leaving all the responsibility of the teaching to digital tools and the students themselves. But as discussed in the previous theme, student centred activities require careful transformation, reflection and clear instructions by the teacher to realize the intended pedagogical aims. Without appropriate content adaption and clear expectations, student centred activities can become ineffective. Fearn (2022) describes this dynamic:

Non-Users felt their students took advantage of the freedom provided by Online community project (OCP) activities. As explained earlier, students will not take learner-centred tasks seriously unless they present an exciting and worthwhile challenge.

(Fearn, 2022:376)

Thus, the teachers perceive that in order to achieve successful student-centred learning with digital tools, they need to spend more time preparing and guiding tasks to make sure students are challenged.

5.2.2 The influence of prior experiences on teachers' confidence and engagement with digital tools

Teachers' perceptions of digital tools are strongly influenced by their previous experience of digital tools. In the analysed articles, teachers with lower digital competence and no previous experience of digital tools are more reluctant to digital integration. The Fransson et al. (2019) study describes how experienced, older teachers with a deep repertoire of traditional teaching methods perceive the call for digitalisation as stressful and threatening, as it may undermine their identity and reputation as successful teachers as they struggle to keep up with the new technologies:

Digitalisation challenges Paul's self-image as 'a good teacher', in that it entails new tasks, roles, and expectations that he struggles to keep up with, and in

many respects also fails to meet. Thus, for him, digitalisation has led to a more negative reconstruction of his self-image.

(Fransson, et al., 2019:110)

Meanwhile, the Fransson et al. (2019) study also illustrates that teachers with a strong personal interest in ICT and substantial digital competence perceive digitalisation as more positive, motivating and a resource which can boost their self-image and professional status:

According to Adam, digital resources motivate him to produce effective and innovative teaching that analogue versions cannot, thus bringing added value. He feels comfortable navigating and elaborating digital resources and finds it joyful. In fact, digital resources seem to be an integrated part of his professional and private life.

(Fransson, et al, 2019:111)

Consequently, teachers' perceptions of digital tools appear linked to their previous experiences. Teachers with limited personal interest in technology, or those accustomed to traditional teaching methods, are less likely to embrace this shift. Furthermore, the increasing demand for digitalisation can place these teachers at a disadvantage, causing stress and challenging their professional identity as they struggle to adapt.

5.3 Perceived pedagogical benefits of digital tool use in EFL classrooms

One common pattern that can be observed in all of the articles is that almost all teachers can see a value and potential in using digital tools as something which, if used correctly, can improve teaching. Digital tools create more authentic material with real recipients and real situations. It also enables more multimodal teaching with a mixture of text, images, audio and video. Teachers perceive this variety of methods and added authenticity to boost student engagement and motivation. In addition, teachers also expressed that digital tools can aid in adapting the teaching to better suit individual needs.

5.3.1 Enhanced authenticity and relevance

One of the most frequently mentioned benefits of using digital tools among teachers is the possibility to create and use authentic material. Many in-service teachers move towards more topic driven content and use the web to find material, as opposed to using a coursebook driven approach (Allen, 2015:258). The benefit is that the content can be adapted to reflect the interest of a specific group. In contrast, a coursebook is limited and has topics based on assumptions of learner's interests and skills (Fearn, 2022:369). Even though teachers acknowledge that finding and transforming authentic material takes time, the benefits are perceived to outweigh the added effort. This perspective is illustrated in the study by Holmberg et al. (2018):

The teachers admitted that finding and creating teaching materials took time, yet it was necessary because it allowed them to use and create material that, in their words, was “more authentic” and illustrated a “real life use of English” (in contrast to material constructed specifically for school use). It was also considered important to use material that was up-to-date and considered relevant by the students.

(Holmberg, et al., 2018:134)

In addition to producing up-to-date and relevant content, authentic material encourages students to critically reflect on the reliability of digital information and sources (Allen & Berggren, 2016:18). It is evident from the studies that authenticity is perceived as one of the most important benefits of using digital tools.

5.3.2 Increased variety, flexibility and adaptability

Another benefit of using digital tools in teaching, which was highlighted by teachers, was the ability to use a variety of multimodal capabilities. These tools facilitate collaboration and allow materials to be created, transformed or produced both in visual, auditory or textual formats, as opposed to just text-based assessment. This flexibility enables teachers to more easily adapt the content to fit the needs of specific students, as Allen and Berggren (2016) observe:

A number of teachers expressed that their pupils performed better when digital literacies integrated into their English teaching, since it was easier to adapt their teaching to the needs of individual pupils.

(Allen & Berggren, 2016:18)

This finding suggest that teachers perceive a value of digital tools in their capacity for differentiation. Instead of using standardized tasks which are the same for all students, digital modalities allow teachers to accommodate diverse learning styles, leading to improved student performance.

5.3.3 Improvements in learner engagement, motivation and autonomy

It is evident from the analysed articles that teachers perceive digital tools to enhance learner engagement, motivation and autonomy. The use of authentic material, as well as real life recipients and situations boosts student engagement and motivation and works as an incentive for the students to perform well.

Examples of this can be observed in the following excerpts from the Holmberg et al.'s (2018) and Fearn's (2022) studies:

Knowing that there was a “real” deadline and/or that a “real” audience would be listening to the podcast or watching the video was an incentive for the students to perform well.

(Holmberg, et al., 2018:136)

The students often came back in the afternoon for eTwinning, whereas they wouldn't have done that for anything else. They really worked hard and participated actively. I gave them tasks to do, and they always did them, even the difficult students (Lia).

(Fearn, 2022:370)

Furthermore, with authentic material, students are encouraged to think more critically and become active participants in their learning. In this student-centred model, the teachers guide and mentor their students to take more ownership of their learning. Segaran and Moltudal (2025) illustrate this dynamic through the experience of Faben, a teacher who utilized automated feedback systems:

Instead of just being a passive recipient of information, the teacher believes that students should take ownership of their own learning and position themselves as independent thinkers. Faben held a positive view of his students' engagement with the feedback provided by the automated system and the collaboration practices with their peers.

(Segaran & Moltudal, 2025:10)

This example highlights that automated systems do not replace the human element of teaching. Instead, it acted as a scaffold that allowed students to take control of their progress. When used effectively automated feedback can enhance engagement and allow students to self-regulate, rather than passively waiting for correction by the teacher.

5.4 Perceived challenges of digital tool use in EFL classrooms

Integrating digital tools into teaching comes with several challenges. Learning how to effectively use new digital tools can be time consuming and challenging without proper support. In addition, use of digital tools requires both teachers and learners to have sufficient technological knowledge. When digital tools are introduced without thought and transformation the purpose of the use can be unclear which can lead to unwanted student usage as well as products which are difficult to assess.

5.4.1 Time constraints as a barrier to effective digital integration

One major obstacle that is mentioned repeatedly in the texts, as one of the main limiting factors for successfully integrating digital tools in teaching, is a lack of time. As discussed previously, successful integration of digital tools requires pedagogical thought and planning, which could increase the teachers' workload. While teachers are positive and even in many cases prefer to use material on the web over analogue coursebooks, finding and transforming material suitable for the classroom takes time (Allen, 2015:257; Holmberg, et al., 2018:134). Even

when teachers can see the pedagogical value in using a tool, they may opt not to use it as it would require time to learn to use effectively. An example of this is observed in the study by Holmberg et al. (2018) seen below:

The reasons why the other teachers did not start or continue to use Blendspace were a perceived lack of time and/or TK to create a Blendspace and a fear of losing control of the assessment process when using material created by others.

(Holmberg, et al., 2018:138)

Furthermore, teachers who lack sufficient technological knowledge have an even bigger need of time for professional development, time to experiment, collaborate, discuss and reflect on how to effectively use the tools. Without time allocated for professional development, many teachers struggle to keep up with new innovations as illustrated in the excerpt from Fransson et al.'s (2019) study of teachers' self-understanding in 21-century teaching contexts:

The time and support allocated for professional development at the school are limited, so they really cannot overcome the steep learning curve when it comes to managing new innovations in teaching.

(Fransson, et al., 2019:112)

Allen and Berggren (2016:19) also conclude that it is hard to achieve a positive change in the classroom without negatively affecting other teacher priorities such as planning, grading and assessment and pastoral considerations.

5.4.2 Lack of practical technological knowledge

Another barrier which is frequently mentioned is the lack of practical technological knowledge. While most teachers can see the value of using digital tools and even to some extent envision how they, in theory, could use a specific tool, they do not have the knowledge to realize their visions in practice. Several of the reviewed articles, Allen (2013), Allen (2015), Fearn (2022), Fransson et al. (2018), Holmberg et al. (2018) and Segaran and Motudal (2025), all show this lack of practical technological knowledge which hinders teachers' use of digital

tools. Holmberg et al. (2018) provides a clear example of in this dynamic in their study:

The results showed that the teachers had the necessary curricular knowledge and content knowledge to identify teaching materials with explanatory value and/or value as models for the intended learning outcomes. It could also be argued that they had the general theoretical technological content knowledge to envision the value of this functionality of ICT. However, at the beginning of the project design conversations revealed that they lacked the specific practical technological knowledge to curate, edit and annotate, i.e. digitally transform, this material to suit their own and their students' needs.

(Holmberg, et al., 2018:135)

In addition, teachers must not only consider their own technological knowledge when they plan to integrate digital tools in teaching, but also the technological knowledge of their students (Holmberg, et al., 2018:137). Moreover, Holmberg et al. (2018) also describe how teaching students to use new tools may also affect lesson time and flow, prompting teachers to avoid using new digital tools:

One of the teachers decided to use the learning management system instead. Although s/he was aware of its limitations, s/he did not want the students to: "have to learn [how to use] a new tool, where to find it and its password".

(Holmberg, et al., 2018:137)

As the teaching becomes more student centred, and students are viewed as more active participants in their own learning, teachers need robust practical technological knowledge to be able to guide their students as well as identify and address potential problems (Segaran & Moltudal, 2025:12-13).

5.4.3 Difficulty in supporting less autonomous or lower proficiency learners

As an extension of the aforementioned problem with lack of student technological knowledge, one more issue is described in the texts. While stronger, more autonomous groups of students appear to have no problem integrating digital tools and work effectively with student centred methods, weaker groups often struggle unless the use of these tools is clearly structured and supported by sufficient teacher scaffolding. One study describes how grouping students with mixed academic level became essential in order to produce any meaningful peer

discussions when using automated feedback (Segaran & Moltudal, 2025:12). Another example can be seen in the study by Fearn (2022), which shows how working with online community projects with weaker or less motivated students, led to students wasting time and to lessons being “a mess”:

I tried to start a new project with a weaker class, but it was a total mess because probably they had no abilities to use [...]. It was very effective with good classes but only with good classes (Gina).

(Fearn, 2022:374)

A third study highlights the need for a clear framework, not only for the students' expected products, but also their working process, to avoid unwanted student behaviour or time wasting (Musk, 2014:130). If it is not clear for the students how they are expected to use the tools and for what purpose, it may lead to unwanted usage or even time wasting, especially for weaker students. In addition, if the teacher does not have a clear overview of the process, the products may be difficult to assess.

5.5 EFL teachers' perceptions of their own digital competence and requirements for developing it

This section deals with how teachers perceive their competence in using digital tools, thus providing the answer to the second research question. All the teachers in the articles use digital tools and material to varying extent in their teaching. Many teachers know what is possible and how the tools could improve their teaching, in theory. At the same time, various articles also highlight flaws when it comes to teachers' practical technological knowledge and the teachers' ability to create more advanced collaborative web 2.0 oriented assignments. In addition, assessment and grading of digital interaction and production can be unclear and complicated. To improve their technological knowledge, teachers call for more collegial learning, design-based learning, support from colleagues, researchers and school leadership as well as time to experiment and reflect.

5.5.1 Perceptions of insufficient yet improvable digital competence

Teachers in the articles are described as having ample *pedagogical knowledge* and *content knowledge*. This enables them to choose relevant digital content for their teaching, as well as identifying potential issues and intervene and adapt when problems appear. Moreover, they are also described to have a general level of *technological knowledge* and are able to integrate ICT on a basic level. It could even be argued that some of the teachers in the articles displayed *technological pedagogical content knowledge* (TPCK) on a theoretical level as they were able to reflect and envision how their ICT use would affect the learning in theory. However, when it comes to specific practical *technological knowledge*, the teachers express that they are unable to realize their pedagogical intentions in practice. This is clearly evident in the article by Holmberg et al. (2018):

Some of the teachers also felt that they had to be able to support students if they asked them to use their own hardware to video record themselves or each other. Here, the teachers did not have sufficient specific practical *technological knowledge* to realise their intentions for increased collaborative teaching and learning. However, they did have the general theoretical *technological knowledge* to envision uses of ICT that could support the collaborative learning of a specific content and thus, arguably, general theoretical TPCK.

(Holmberg, et al., 2018:136)

Holmberg et al. (2018) also observe that while teachers lacked specific practical *technological knowledge*, their general theoretical *technological knowledge* serves as a strong foundation. As highlighted in the excerpt below, this theoretical understanding enabled them to quickly learn how to use digital tools to more specific ends, and to realize their intentions once they received guidance from an expert:

Having a theoretical and general understanding of a certain use of ICT meant that a quick demonstration or description by the on-site researcher helped them to develop the practical and specific knowledge and skills to use ICT as per their intentions.

(Holmberg, et al., 2018:139)

Consequently, teachers perceive their own digital competence as limited but improvable. Many teachers perceive themselves to have fundamental

technological knowledge which enables them to integrate digital tools at a basic level, often as a complement to traditional teaching methods. Teachers also display an understanding of the potential of more advanced digital tool use, in theory. However, it can also be observed that teachers perceive a lack of *technological knowledge* to use digital tool in more advanced collaborative and multimodal learning in online or hybrid spaces, in practice. To overcome this hurdle, teachers express a need for guidance.

5.5.2 Perceived importance of practice and collaboration in competence development

Almost all articles agree that teachers best develop their digital competence through collegial collaborative learning. Collaboration and mutual support help teachers expand their understandings and pedagogical repertoires (Tumelius & Kuure, 2024:1573). By getting the opportunity to discuss and reflect together, teachers can help each other identify issues, solve problems and evaluate teaching. In addition, teachers or experts with more advanced *technological knowledge* can help more inexperienced teachers to get started and develop agency (Fearn, 2022:371). Moreover, hands-on practice with small-scale authentic projects where teachers can experiment and get familiar with the tools also help teachers develop agency and belief in the usefulness of said tools (Allen & Berggren, 2016:18; Segaran & Moltudal, 2025:9).

5.5.3 Perceived need for targeted professional development

Teachers express a strong demand for professional development. Implementing new tools can have a steep learning curve and is a time-consuming process, especially for teachers with weaker *technological knowledge*. With limited time, teachers need to prioritize and in doing so many may avoid using tools which require more adaptation and adjustment (Allen, 2013:11). Cerratto Pargman et al. (2018) highlights that organising collegial collaborative learning is often outside

of the teacher's control, thus, a supportive school leadership which allocates time for professional development is required if teachers are expected to use ICT:

The teacher's appropriation of the new artifact(s) depends not only on the utilization schemes s/he is able to develop but also on aspects that are outside of the teachers' control, such as an active school leadership that mentors and encourages teachers to discuss and reflect on their current practices and their eventual transformations.

(Cerratto Pargman, et al., 2018:229-230)

Furthermore, Allen (2013) describes that this training needs to encompass more than just basic ICT usage and include collaborative learning where teachers can construct knowledge together through dialogue and reflection:

The results of the survey suggest that any ICT in-service training programme needs to go beyond not only what might be crudely put as 'button pushing' but also a wider social constructivist/collaborative framework.

(Allen, 2013:12)

To keep up with the demands of the rapid digitalisation, teachers perceive a need for professional development and time for practice, collegial learning, supervised projects and positive experiences.

6 Discussion

In this chapter the key findings will be interpreted, critically discussed and put in relation to the research questions, theory and the reports from Skolverket.

Sections 6.1–6.2 deal with interpretations of teachers' perceptions of the use of digital tools and teachers' perceptions of digital competence. Section 6.3 subsequently discusses the method, section 6.4 reflects on implications for the teacher practice and section 6.5 concludes by offering suggestions for future research.

6.1 Discussion on perceptions of use of digital tools

The overall findings of the study indicate that teachers hold mostly positive perceptions of the use of digital tools in the EFL classroom. When properly transformed teachers perceive digital tools to boost student engagement through authenticity and increased variety of modality (Allen & Berggren, 2016:18; Holmberg, et. al, 2018:136; Fearn, 2022:370). This aligns well with the findings from the report published by Skolverket (2018:57-60) on digitalisation in schools. Furthermore, teachers acknowledge that effective use of digital tools requires time for reflection, experimentation and careful design (Segaran & Moltudal, 2025:12; Musk, 2014:130). Unthoughtful and unstructured implementation can lead to unwanted and distracting student behaviour, especially with less autonomous groups (Fearn, 2022:374). With limited technological knowledge implementation of digital tools can be time consuming and stressful (Holmberg, et. al., 2018:138). This also supports the findings of Skolverket (2018:23;54-55;63) which highlights that teachers need to spend more working hours with different digital systems, leaving less time for students.

While the analysed articles predominantly show positive perceptions of digital tool use, a critical voice could state that these finding partly could be explained by methodological and contextual factors. It can be argued that the articles display an overrepresentation of positive narratives of digital use. Digital competence can boost teachers' self-image and view as a professional teacher, as discussed in the article by Fransson, et. al. (2019:110-111). Consequently, since the articles are based on qualitative methods such as interviews, observations and surveys, they could be influenced by the desire among participating teachers to express positive views, as this may be seen as expected by the researchers. In addition, many of these studies are conducted as small scale studies where teachers receive professional development and support from researchers on how to use the digital tools in question. This hands-on experience and time for guided experimentation is something which the teachers express as very helpful and even a requirement to develop the skills necessary to use the tool on their own (Allen & Berggren, 2016:18; Segaran & Moltudal, 2025:9; Tumelius & Kuure, 2024:1573). This time

and guidance might not be always available in the everyday school context. In addition, while teachers in the studies express time constraints, lack of technological knowledge and unwanted use of tools, these failures and interrupted attempts to implement digital tools receive less attention in the articles which could lead to a misrepresentation. As a final critical reflection, it is worth noting that many teachers in the studies express the use of digital tools as mainly beneficial as a complement to already established traditional teaching methods (Segaran & Moltudal, 2025:13). Digital tools that would require teachers to make more drastic changes in their teaching practice are more likely to be avoided (Allen: 2013:12). Given that seven out of ten articles were published before the artificial intelligence (AI) boom in 2020, and only one article addresses the topic of AI, there is a clear need for future research to explore how the advances in AI has affected teachers' perceptions and pedagogical practices in Nordic countries, as this technology has meant the most drastic changes for teaching practice since the arrival of the internet.

6.2 Discussion on perceptions of digital competence

As for perceived digital competence, the findings from the articles show that teachers have a fundamental level of what Mishra and Koehler (2006:1026) describe as *technological knowledge* (TK). Many teachers can use digital tools for basic use that supports traditional teaching methods but often lack more advanced technological knowledge on how to use digital tools for more complex collaborative and multimodal learning in online or hybrid spaces (Allen 2015:259). However, their general understanding of technology helps them in quickly learning to use new digital tools if they are given guidance (Holmberg et. al. 2018:139). Furthermore, teachers' perceptions of digital tools reveal that teachers appear to possess *technological content knowledge* (TCK), i.e. an understanding of the relationship between technology and content (Mishra & Koehler, 2006:27-28). As discussed in the previous section, teachers can understand and appreciate the impact which, for example, authentic material has

on the content and see how this can lead to increased student motivation and engagement. The area where the biggest need for digital competence development can be observed is *technological pedagogical knowledge* (TPK). TPK is described by Mishra and Koehler (2006:1028-1030) as teachers' knowledge about what tools exist, which technology is best suited for specific tasks, and knowing how methods change when technology is introduced. This corresponds well with the knowledge gaps in teachers' digital competence in many of the articles. An example of this can be seen in the article by Holmberg et. al. (2018:135), where it is described how teachers in the study had sufficient content knowledge to identify valuable digital material, which shows TCK as they can understand the relationship between technology and content. However, before receiving guidance, the teachers lacked the specific practical ability to curate, edit or annotate this material to fit their needs, which shows lack of TPK (Holmberg et. al., 2018:135). TPK requires teachers to reflect on how digital tools fit into a specific complex school context. Furthermore, it demands an understanding of which digital tools best suit specific student groups and how they impact teaching methods. This requires, as the teachers express, time, experimentation and guidance.

It should be noted that digital competence among teachers is uneven and situational. For some teachers, digitalisation is perceived as an opportunity and a boost to their professional status. At the same time many teachers perceive their digital competence is insufficient in relation to the demands that come with digitalisation (Fransson, et al., 2019:110-111). Many teachers perceive a need for professional development in digital tools. This corresponds well with the findings reported by Skolverket (2016:11) which stated that 50% of teachers expressed a need for professional development on using digital tools in teaching. Due to the complexity of the school context, this professional development must encompass more than just presenting teachers with digital tools. To be effective the professional development should include a wider social constructivist/ collaborative framework (Allen, 2013:12). The call for collegial collaborative learning can be seen in almost all the articles. In addition, teachers also perceive

hands on experimentation and practice guided by experts or colleagues to be helpful (Fearn, 2022:371; Tumelius & Kuure, 2024:1573). Mishra and Koehler (2006:1031) also support the view that professional development of digital competence cannot be reduced to presentation of resources. Teachers must be given a deeper understanding of how technology relates to content and pedagogy in a dynamic school environment. In conclusion, teachers' perceptions of their own digital competence are that they have a fundamental but limited knowledge to build upon. To meet the demands of the digitalisation in schools, teachers perceive a need for deeper professional development and collegial learning.

6.3 Method discussion

In this final section the method of the study will be discussed along with its benefits, drawbacks and limitations. The decision to conduct a systematic literature review (SLR) was based on the benefits of the method concerning the ability to produce an objective overview of the research in a field where a considerable amount of data already exists (Denscombe, 2021:201-203). While the SLR is advantageous for providing answers and guidance in these vast research fields, it does also come with a number of drawbacks.

Firstly, to produce meaningful conclusions, the SLR needs to be based on a considerable amount of published research (Denscombe, 2021:203). The use of ICT resources in English language teaching is a well-researched topic, which means that the first criterion for an SLR is satisfied. In addition, it needs a well-defined problem and scope (Denscombe, 2021:203). In the present study, the choice was made to delimit the scope to research conducted in the Nordic countries. This scope meant that the research included in the SLR is maximally relevant for the teacher practice in Sweden.

Secondly, SLR is mostly known for dealing with quantitative data, as the findings from quantitative datasets with standardized models such as randomized control trials are easier to compare, evaluate and synthesize (Denscombe, 2021:204).

When dealing with qualitative datasets, as in the case of this review, one must consider how research with different methodologies and scopes can be compared. The answer to this question is to use a thematic analysis, and identify common themes in the data, rather than making direct comparisons (Denscombe, 2021:204). While the objectivity of the findings can be questioned when dealing with qualitative data, as the researcher's own identity, background and preferences could affect the outcome, steps have been made to strengthen the validity of the claims and to remain unbiased (cf. Denscombe, 2021:428). These steps include a careful, systematic and transparent approach in data selection and analysis. While the analysed studies cannot be directly compared, the well-defined scope of the study helps in that the studies are all conducted in a similar context (Nordic countries), and they all deploy a qualitative method. In line with Denscombe's (2021:205-213) recommendations, key words and databases were carefully selected and transparently communicated, as well as a description of the screening procedure, inclusion and exclusion of articles, and finally use of reflexive thematic coding and analysis.

Finally, it is also important to consider that this SLR is based exclusively on published and peer reviewed articles; no unpublished articles are included. While it is less common to withhold research for commercial purposes within the field of social science, this possibility cannot be completely dismissed as the study deals with technology where commercial gain could be made (cf. Denscombe, 2021:214). As a final note on the sample, it is worth noting that this review deals with a relatively small sample of studies. Within the limited scope of the study, the dataset is relatively small and some of the researchers appear in more than one of the articles, which could influence the findings.

6.4 Implications for the teacher practice

The findings of this study carry multiple implications for the practice of teaching EFL in a Nordic context. Firstly, if teachers are expected to improve their digital competence, school leadership and teacher education need to allocate time for

professional development where teachers can collaborate, experiment with different digital tools, design specific lessons around it, reflect and evaluate before full-scale implementation. Given the discrepancy between teachers' relatively high technological content knowledge (TCK) and low technological pedagogical knowledge (TPK), this collaborative learning should, as described by Allen (2013:12), move beyond just sharing resources or "button pushing" and include a wider social constructivist/collaborative framework. Secondly, teachers should take advantage of the benefits of using digital tools expressed in the studies, namely the authenticity, multimodality and its effects on student engagement. Given that the curriculum already supports multimodal variation and a diverse range of texts, both fictional and authentic, teachers should leverage the specific advantages digital tools offer in this domain.

6.5 Suggestions for future research

Based on the limitations and findings of this review, several areas of future research can be identified. The most pressing gap is the impact of Artificial Intelligence (AI) on the EFL classroom in a Nordic context. As noted in the discussion, the majority of the analysed articles were published before the widespread accessibility of generative AI. Thus, it would be of interest for future research to explore what effect this technology has had on teachers' perceptions of digital tools and whether AI can act as a scaffold that improves teachers' technological pedagogical knowledge (TPK) by assisting with lesson design, or if it further adds to teachers' anxieties regarding assessment validity and student agency. Moreover, as highlighted in the discussion, several of the studies included in this review are based on small-scale qualitative data collected in close collaboration between the researcher and the participating teachers, which may entail an overrepresentation of success stories from participants who desire to be seen in a favourable light by the researcher collecting the data. Hence, it would be of interest to explore how these results compare to studies based on quantitative methods without a researcher present on site with the participants.

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