

Christiane Lütge  
Thorsten Merse (eds.)

# Digital Teaching and Learning: Perspectives for English Language Education

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# The Digital Competence of English Language Educators: Exploring the *DigCompEdu Framework* with an Empirical Case Study

Christiane Lütge, Thorsten Merse and Xiaoli Su

## Introduction

### Abstract

The digitalization of schools and classrooms would be unthinkable without the adequate preparation of teachers. It is their digital competence that facilitates a mindful and goal-oriented use of digital technologies and resources, while remaining critical and strategic in view of digital innovations and practices currently underway in education. Yet what exactly does the digital competence of a teacher entail, and what in particular does it mean to be a digitally competent English language teacher? To engage with these questions, this article will present the *European Framework for the Digital Competence of Educators* and explain its orientational function for teachers who are seeking to integrate digital competence into their professional repertoire. With a view to achieving this challenge in EFL classrooms, this article continues to provide an empirical case study that was conducted with over 180 pre-service teachers in a university-based teacher education context. Both the results of this study and the TEFL-specific analysis of the competence framework will finally be used to draw conclusions for the digitally-oriented professional development of teachers.

### Warm-up

- ▶ Do you generally welcome the use of digital technology in schools, or are you rather skeptical towards current digital developments? What are the reasons for your opinion?
- ▶ What is your experience with using digital resources for your own learning processes? What tools have proven to be useful, and what practices of learning do they facilitate?
- ▶ In what ways could the teaching and learning of English benefit from the use of digital technologies and resources? Do you know any applications that are helpful in this regard?

- ▶ How digitally competent are you as an educator, be it at the pre-service or in-service stage? Make a list of the competences you already have, and try to assess for yourself how well-developed they are.
- ▶ What does the digital EFL classroom of the future, say in 2050, look like, and what is your role as an EFL educator after this time leap?

**Answer any of the above questions if you wish.**

## **1 The Digital Competence of Educators: Avenues into the *DigCompEdu* Framework**

education  
in the dig-  
ital age

While large-scale ramifications of ubiquitous digital changes profoundly affect social, working, and civic lives at large and the way people communicate with each other, also teachers see an urgent need to rethink and reconceptualize the objectives and opportunities of teaching and learning in the digital age. Digital transformations in education and the integration of digital technologies into classrooms would indeed be unthinkable without the professional and creative implementation, fostering, and guidance of teachers. Here, teachers can be seen as transformation-oriented agents of change (cf. Viebrock 2018: 52) to model the deep educational shifts brought about by increasingly digitalized educational worlds. At the same time, this poses an immense challenge to teachers, who need to engage in continuous professional development to acquire ever-new competences – in this case, professional digital competences. In view of this unprecedented educational endeavor, what is needed is a structured orientation regarding such questions as what these competences are in the first place, what they entail, and how they can be modeled to affect education positively.

orienta-  
tion:  
the Dig-  
CompEdu  
framework

Such orientation is provided by the *European Framework for the Digital Competence of Educators*, also often abbreviated to the simpler *DigCompEdu*. According to its own description, this 2017 framework – authored by Christine Redecker, edited by Yves Punie, and published through the European Commission – aims at supporting national, regional and local efforts in fostering teachers’ digital competence so that they can “seize the potential of digital technologies for enhancing and innovating education” (Redecker 2017: 8). This joint European effort is then meant to be initiated and achieved through “a common frame of reference, with a common language and logic” (ibid.: 7) that this framework provides. Ultimately – and this stresses the important role and linking function of teachers – the framework seeks to empower learners at all levels by fostering their own digital competence for thriving in their thoroughly digitalized worlds of life and learning (cf. Lütge, Merse & Su 2019: 4–5).

**Is there anything similar in Korea? Search on Naver for any information and guidelines regarding technology use in education. What did you find?**

### **The background of the *DigCompEdu***

The *DigCompEdu* framework originates in research carried out by the Joint Research Centre (JRC), which is the European Commission’s science and knowledge service. Starting in 2005, the aim of this research was “to provide evidence-based policy support to the European Commission on harnessing the potential of

digital technologies to encourage innovation in education and training practices; improve access to lifelong learning, and impart the new (digital) skills and competences needed for employment, personal development and social inclusion” (Redecker 2017: 7). Next to the *DigCompEdu framework*, this research on digital transformation and corresponding changes in requirements for competences has also provided additional other frameworks, e.g. for the digital competence of citizens (*DigComp*), educational organizations (*DigCompOrg*) or consumers (*DigCompConsumers*).

The *DigCompEdu* spreads out the digital competence of educators into six focus areas in order to classify what it means to be professionally and pedagogically competent in view of the digital. These areas entail:

digital  
compe-  
tence: six  
areas

**Area 1:** Professional Engagement

**Area 2:** Digital Resources

**Area 3:** Teaching and Learning

**Area 4:** Assessment

**Area 5:** Empowering Learners

**Area 6:** Facilitating Learners’ Digital Competence

Each of these six areas is, in turn, categorized into 22 more fine-grained sub-competences that are explained and exemplified below.

Two aspects require further clarification in order to understand and work with the *DigCompEdu framework*. For one, the framework provides a very general pedagogic overview of digital competences. While these descriptions are certainly a valuable and helpful point of entry into professional development, they tend to lack more detailed subject-specific articulations, e.g. for foreign language education. Therefore, the various areas of this framework always need to be made relevant for foreign language education by transferring its trajectories into this particular domain.

lack of EFL  
specifica-  
tions

Second, the *DigCompEdu framework* represents a progression model that projects the competence of educators into increasingly demanding levels of expertise and professional engagement. These can range from working on an initial curiosity towards digital teaching to spearheading the renewal of one’s educational institution by taking into account the digital. Interestingly, the framework imports the A1 to C2 competence scales that are already known to foreign language teachers and experts from the *Common European Framework of References for Languages (CEFR)* (Council of Europe 2001). According to the description within the *DigCompEdu*, such a progression model is supposed “to help educators assess and develop their digital competence” (Redecker 2017: 9). From our point of view, the strength of the framework lies in its function as a reflection tool for future and in-service teachers: Continuous reflective practice and engagement along the scales of the *DigCompEdu* can prepare teachers for initiating

progres-  
sion model

If you are not familiar with CEFR, search for information about it online.

new steps in their professional development, and intensify their confidence for working competently at their current level.



### **The Progression Model of the *DigCompEdu* framework**

A1: *Newcomer*

A2: *Explorer*

At these levels, educators collect and synthesize new information and develop a basic repertoire of digital practices.

B1: *Integrator*

B2: *Expert*

Within the B domain, educators increasingly expand on their professional repertoire and apply their growing digital competence in practice.

C1: *Leader*

C2: *Pioneer*

At the highest stages, educators disseminate their knowledge of digital practices and continuously develop new practices while critiquing practices currently in use.

ABC  
levels

Depending on the area, the digital competence level of a teacher might differ. For example, she can be a B2 *Expert* in assessing and professional engagement, whereas she has just recently taken on the issue of learner empowerment, making her an A2 *Explorer*. While A1-A2, B1-B2 and C1-C2 are more closely related, a progression from A to B and B to C marks greater and more cognitively challenging advancements. Thus, when teachers move through these levels, they develop from an initial curiosity and willingness to use digital technologies (A level) to an increasing diversification of meaningful uses (B level) up to reflective critique and corresponding initiatives for renewal (C level) (cf. Redecker 2017: 28–30). We would like to point out that one of the major shortcomings in recent debates about digital competence lies in its perception as a quasi-static construct rather than as a dynamic system, which is in constant development and might thus be seen as a “moving target”.



### **What is your current level of digital competence?**

When you read through the following competence descriptors and levels, reflect for yourself: What would your current stage be in the respective domain? Where are your strengths and weaknesses? What would you wish to improve throughout your professional development? When you pass through the empirical study later in this chapter and get to know the questionnaire, continue the reflective effort you began here.

**What is your current level of digital competence in relation to the 6 areas (previous page)?**

## 2 The Areas of the *DigCompEdu* framework - Made Relevant for English Language Education

The first area of the *DigCompEdu* – professional engagement – addresses the need to use digital technologies for communication, collaboration and interaction with colleagues, learners and parents, and to seek out digital opportunities for one’s individual and continuous professional development (cf. Redecker 2017: 16; 19; 33–41). Four sub-dimensions are included:

profes-  
sional en-  
gagement

- ▶ **Organizational communication:** Teachers use digital technologies for communicative purposes within their institution (i. e. with colleagues and learners) and outside of it (e. g. with parents and other third parties); for example, teachers use e-mail or virtual learning environments to provide learning resources or communicate appointments or feedback.
- ▶ **Professional collaboration:** Teachers employ digital technologies to collaborate with other teachers in order to exchange valuable knowledge and experience, and thus, to innovate pedagogic practices within professional teams, e. g. by developing a new project in a collaborative cloud environment.
- ▶ **Reflective practice:** This dimension does not include digital technologies as such, but adds a critical and reflective component in that teachers are asked to constantly reflect on and, as a result, develop further their digital practices, both individually and collectively, e. g. by asking more advanced teachers for help or signing up for a training course.
- ▶ **Digital continuous professional development (CPD):** Teachers seek out digital opportunities for their ongoing and lifelong professional development, e. g. to use the internet to learn about new teaching methods and content.

While the first, second and third sub-dimension function on a general level, CPD is clearly an area that can best be specified for foreign language education, as is illustrated in the example below. In terms of the progression model, a *Newcomer* would only rarely use digital technologies, whereas an *Integrator* would be good at making effective digital choices and exchanging digital expertise with peers. *Pioneers* would then innovate and redesign whole institutional practices and group activities with their accumulated digital experience.

**Did your digital competence develop during the Covid pandemic? How?**

### Digital resources for CPD of foreign language teachers

**Video tutorials:** Subscribe to YouTube channels like Moodle or Blackboard Inc., or work with the YouTube series of ‘Teaching Tips’ by *International House World Organisation* where esteemed global teacher trainers share their expertise.

**Webinars:** Global organizations such as the IATEFL frequently offer new webinars on ELT ([www.iatefl.org/events](http://www.iatefl.org/events)).



**Online communities:** Many professional organizations offer participation in online communities, e. g. the TESOL Communities of Practice, MELTA, or ELTABB. Less formal grassroots movements of ELT teachers can be found on Facebook, often with a specific theme in mind, e. g. the public group ELT Footprint for bringing environmental awareness into teaching (<https://www.facebook.com/groups/eltfootprint>).

digital re-  
sources

In the second domain of ‘Digital Resources’, teachers become increasingly competent at navigating the diversity of digital resources and technologies to make informed choices that benefit their learner groups and learning objectives, and that match their personal teaching styles. Three components are included, each of which is made relevant here for foreign language education (cf. Redecker 2017: 20, 43–49):

- ▶ **Selecting digital resources:** Teachers identify and select available digital resources and plan their use while keeping a suitable match with their learners, methods and objectives in mind. For example, learners could use the hashtag #blacklivesmatter to compile information on how the virulent topic of racial violence and discrimination in the USA is negotiated in social media such as Twitter, Facebook, or Instagram.
- ▶ **Creating and modifying digital resources:** With this sub-dimension, teachers are additionally encouraged to create their own digital resources, or modify existing openly-licensed resources (also jointly in a team), e. g. by using tools such as Padlet to create a digital collage board about the long-standing racial divide in the U.S., or to provide a resource for vocabulary enrichment (including images, text, and audio) to facilitate the conversation about this issue.
- ▶ **Managing, protecting and sharing digital resources:** This sub-dimension includes efficient management of digital resources (e. g. on a learning platform) and dealing sensitively with privacy protection, copyright rules and personal data (e. g. when attributing open-license image rights properly in a self-made explainer video on slavery and colonialism in American history).

While the A1/A2 levels of this area entail basic operations such as making a list of promising resources for future use, creating a worksheet using Office software or sharing a resource in an e-mail attachment, the B levels add further complexity in view of evaluating the quality of a new resource, managing a learning platform such as Moodle for a class, or combining various interactive elements into a learning activity. Ultimately, the C2 level turns teachers into *Pioneers* that guide other colleagues or set up sophisticated and annotated learning repositories for their schools (cf. also Lütge, Merse, Su 2019).



### Choosing TEFL resources

One example of self-made educational resources are explainer videos, which teachers can use to move instructions into learners' independent learning phases at home, or to make it easier for learners to revisit difficult content in this recorded form whenever they feel the need to do so. These videos are often used in a blended-learning environment, where students learn at least partially through online learning and interact with their peers and teachers face-to-face (cf. Ullmann 2018). Suitable tools include:

[www.mysimpleshow.com](http://www.mysimpleshow.com): A user-friendly tool to create dynamic explainer videos in four steps: draft, write, visualize and finalize;

[www.lumen5.com](http://www.lumen5.com): This tool, normally intended for marketing purposes, can also be used by teachers to convert content into videos, e.g. by pasting a website link or new text; the tool pulls text and images into a video board, where they can be edited further;

Camtasia: This fee-based and more elaborate software allows for screen-casting and video-editing, e.g. for adding an explainer voice-over to a deck of presentation slides.

Whereas the second domain is more concerned with selecting and preparing digital resources, the domain of 'teaching and learning' moves to implementing digital technologies in teaching practice and learning processes. In a way, this area lies at the heart of the whole *DigCompEdu framework*, which ultimately aims at enhancing education for the benefit of all learners, which includes a shift of focus from teacher-led to more learner-centered processes (cf. Redecker 2017: 20–21; 51–59). On a fine-grained level, this competence area is spread out against four sub-dimensions:

teaching  
and  
learning

- ▶ **Teaching:** In this key dimension, teachers integrate digital devices and resources to create effective teaching interventions as part of a carefully orchestrated digital strategy and classroom structure. For example, the teacher could show a short film clip on an interactive whiteboard; then learners analyze a set of film stills for cinematographic devices on a tablet device so that they can annotate the stills with their results, and display their annotated stills back on the whiteboard for presentation and discussion with the whole class.
- ▶ **Guidance:** Here, teachers enhance learner-teacher interaction to offer support to learners with digital technologies, for example, when responding to questions on a homework assignment in a Q&A section on the online class platform, or when monitoring progress on a written essay in a collaborative writing environment such as Etherpad or GoogleDocs.
- ▶ **Collaborative learning:** Teachers support learners in collaborating, communicating and creating knowledge with each other, e.g. when they create an entry

for a class wiki on a culture-related topic such as food while using chat or video conferencing to negotiate the details; or when they give each other peer feedback on essays and papers with the help of an online tool such as Peerceptiv.

- ▶ **Self-regulated learning:** Here, teachers help learners to improve their learner autonomy and to reflect on their own learning process, e.g. when teachers enable learners to use a digital portfolio in which they plan their next learning steps, and document their results and reflections through texts, voice recordings, or videos.

In the progression scale, teachers move forward when they increasingly experiment with new formats and become experienced with a wide digital toolkit to offer interaction and guidance and to facilitate both collaborative and independent work. A *Pioneer* (C2) does not only manage online learning sessions and interactions, but also innovates teaching strategies by developing new pedagogic methods and adjusting them to their context following critical self-reflection. One example could be to experiment with the flipped classroom (FC), a relatively new teaching approach which has traditional face-to-face information transmission occur online and that renders it possible for learners and teachers to engage more in active and collaborative in-class tasks (cf. Ullmann 2018; Carbaugh & Doubet 2016).

Within the area of assessment, digitally competent teachers know how to use suitable digital technologies to enhance (but not to replace) existing assessment strategies, and to create or facilitate innovative assessment approaches, by engaging the following sub-dimensions that are connected in a cascade of interventions:

- ▶ **Assessment strategies:** Within this aspect, teachers seek to improve the diversity of suitable assessment formats with digital technologies, e.g. by using classroom response systems for grammar and vocabulary testing, or by using digital test environments for diagnosis that are often provided by publishers of print coursebooks.
- ▶ **Analyzing evidence:** Closely linked to the sub-dimension above, teachers use digital technologies to generate, select, analyze and interpret data on learners' progress and performance, with a view to shaping future learning and teaching interventions.
- ▶ **Feedback and planning:** Here, teachers provide targeted feedback to learners based on the evidence generated by digital technologies. For example, a teacher can provide recorded audio-feedback on a learner product (such as a writing assignment), and point out pathways for improvement (such as the more careful use of online dictionaries, or a better double-checking of information found online).

In terms of assessment strategies, for instance, an *Expert* (B2) teacher is able to use a range of digital tools for formative assessment strategically both in and out of the classroom, while *Leaders* (C1) would be more aware of the benefits and drawbacks of digital and non-digital assessment formats and adapt their strategies accordingly

through critical reflection. On the A level, teachers make use of simpler data collections, e. g. by collecting oral grades in a digital spreadsheet over a school term to show learners their individual development.

### Assessment tools

Digital quizzes, voting tools and classroom response systems: Socrative, Quizizz, Poll Everywhere, The Answer Pad, Kahoot!

Digital portfolios: Seesaw, Bulb, Padlet, or personalized sections within the virtual learning environment or management system a class is using.



The area of empowering learners addresses the potential of digital technologies to enhance learner-centered pedagogies that involve learners equally and deeply in the learning process. In particular, this area encourages teachers to work on central educational challenges such as inclusion and more personalized and differentiated teaching. In a way, it can be said that this area develops a specification of the broader areas of digital resources and of teaching and learning (Redecker 2017: 22; 70–75). Sub-dimensions of learner empowerment include:

empow-  
ering  
learners

- ▶ **Accessibility and inclusion:** With this competence, teachers ensure that all learners have access to the digital resources in use, in particular learners with special needs and different abilities. This includes, first of all, to consider digital resources that can be accessed by all depending on available technological equipment, and to create or modify learning resources with special needs in mind. This also covers the use of assistive technologies, e.g. by using recorded audio rather than textual task instructions, or by changing design principles concerning font, size and color in worksheets for learners with visual impairments.
- ▶ **Differentiation and personalization:** Here, teachers implement differentiation strategies according to learner levels and needs and design individual learning pathways through digital technologies (e.g. by practicing dialogues at different difficulty levels with the tool Voki where learners speak through avatars, by using online quizzes with different speeds, by developing individual work plans in digital portfolios, or by making available additional tasks in a virtual learning environment that address overachievers).
- ▶ **Actively engaging learners** makes teachers develop digital strategies for increasing motivation, deep thinking and creative expression in hands-on activities, in particular to involve learners in a subject-specific issue. This sub-dimension includes, for example, to design multi-sensory technologies to visualize and explain new content, to use technologies in intensive research cycles to solve a problem (e.g. on the real use of water in food production), or

to present working results through creative expression, e.g. a poem as a digital story.

In terms of the competent progression in this field, teachers can, for example, develop from an initial A1-A2 curiosity in achieving inclusion and involvement digitally (e.g. through the basic use of digital animations or videos for hands-on explanations), to creating tailor-made digital resources to assist special needs (B2), to innovating a school's set of digital strategies for inclusion and differentiation (C2).

## exercise

### Suitable tools for empowering learners - Taking stock

Identify digital resources and technologies that you consider helpful to actively engage learners and to cater for inclusion and differentiation needs. Go through the suggestions presented in this article and re-evaluate them from the perspective of learner empowerment, or research suitable tools yourself, e.g. by using the inventory of ICT tools and open educational resources provided by the European Centre of Modern Languages (<https://www.ecml.at/Resources/InventoryofICTtools/tabid/1906/language/en-GB/Default.aspx>). In what ways can the tools you have selected create more learner-centered classroom activities and methodologies?

facilitating learners' digital competence

The last area can be understood as the culmination of all previous competence domains of educators, when teachers apply their digital know-how to fostering the digital competence of learners (Redecker 2017: 23; 77–87). Within this shift of focus to learners, teachers receive a central role in view of the following five sub-dimensions:

- ▶ **Information and media literacy:** Teachers encourage learners to articulate a concrete information need, then proceed to searching, organizing, storing and analyzing new information, and finally, to evaluate the credibility and reliability of information and its sources. For language learning, learners could work with an online language databank such as the British National Corpus to research collocations. For cultural and global learning, learners could collate different opinions and perspectives on a sustainability issue such as palm oil production.
- ▶ **Digital communication and collaboration:** Here, teachers prepare tasks that require learners to use digital technologies for communication, collaboration and civic participation effectively and responsibly, including, for example, the co-construction of knowledge, awareness of behavioral norms in online worlds, and understanding appropriate digital communication means. For example, learners could design a webinar with an author of the book they are reading, moving from the invitation via e-mail, to the joint collection of suitable questions, to welcoming the guest and hosting the event via a video-conferencing tool such as Zoom.
- ▶ **Digital content creation:** Within this dimension, teachers encourage learners to create learning outcomes and products in digital ways, e.g. by using present-  
**Describe a webquest or a digital collaboration or digital content creation that you would like to try with your students.**

tation technologies such as Prezi, or by handing in a working result as a video. The issue of knowing copyright and licensing rules is covered here, too.

- ▶ **Responsible use:** Here, teachers aim at equipping learners with a positive attitude towards digital technologies and ensuring that learners know how to manage their physical, psychological and social well-being, e.g. in view of privacy issues, sharing personal information on social media platforms, or protection from cyberbullying. Such concerns could be turned into relevant project work in which learners move from gaining knowledge of an issue to concrete implementations.
- ▶ **Problem-solving:** Within this dimension, teachers invest continuous efforts to help learners identify and solve technical problems, update their digital competence with regard to new arrivals in the technological and digital world, or transfer available knowledge to new situations. For foreign language education, it makes sense to negotiate and perform such tasks in the foreign language through providing appropriate language (e.g. ‘My device is not working properly.’ – ‘Maybe the batteries need recharging?’ – ‘Oh yes, that is the problem. Thank you.’).

Regarding information literacy, for example, learners may be good at finding information quickly but they need assistance in terms of how to assess the reliability of the sources of information and how to synthesize information from them. An *Integrator* (B1) can implement learning activities fostering this competence. A more strategic educator like an *Expert* (B2) would use a variety of pedagogic strategies to help learners combine information more critically and meaningfully, and more importantly, teach them how to quote sources in an appropriate way.

Admittedly, reading about the digital competence of educators in such a condensed way provides a heavyweight of information that needs to be processed and digested. Therefore, it might be advisable to understand this framework as an opportunity for continuous development – rather than the expectation that all of the 22 sub-dimensions of the six competence areas need to be fully developed all at once. Also, it needs to be said that not all teachers necessarily start at the lowest A1 level, in particular because they might bring many existing skills to their profession which can be fitted into the *DigCompEdu framework*. Also, not all teachers need to progress up to the C2 level, since this level is primarily concerned with transforming and innovating whole institutions, rather than individual classrooms and learner groups. While for practicing teachers the *DigCompEdu* can be a source for in-service training to stay up-to-date, pre-service teachers are faced with the challenge of acquiring digital competence already during their teacher education. To shed light on this particular situation, the following section presents how the *DigCompEdu framework* was explored with an empirical study on future teachers’ digital expertise and attitudes towards digital education. Another issue that may be raised and that we cannot follow any further here would lead to the question whether there may not only be progress but also regressing tendencies, or in other

digital competence: a life-long challenge for teachers

words, whether we are speaking about a necessarily unidirectional development or whether reverse tendencies might be possible, too.

### 3 Exploring Future Teachers' Expertise and Attitudes: An Empirical Study on the *DigCompEdu Framework*

#### 3.1 Rationale of the Empirical Study

Despite the importance of improving teachers' digital competence emphasized internationally in policy documents such as the *DigCompEdu framework*, the expected educational revolution might still and often be waiting to occur. Teaching practitioners are frequently branded as "resistant to technology, Luddites and risk-averse" and seem to be under a more general suspicion of failing to achieve success in improving teaching and learning with digital technologies (Howard & Mozejko 2015: 311). The discrepancy between the policymaking and teachers' resistance has been documented by research (Tallvid 2016; Watty et al. 2016; Kamilah & Anugerahwati 2017), and there is an established gap between policies and the actual use of digital technologies in teaching and learning (Madsen et al. 2018). It would be too short-sighted, however, to simply blame teachers for their alleged deficiencies, as other factors also play a decisive role for the digital turn in education, including school equipment and access to further training opportunities. Indeed, the empirical study will show that any claim related to teachers' resistance to technology needs critical challenging.

Yet, it must be emphasized that the effectiveness of implementing information and communication technology (ICT) in schools may rely on "how well teachers and future teachers are able to implement and use ICT in an effective and appropriate manner for teaching and learning" (Røkenes & Krumsvik 2014), apart from students' digital competence. A study conducted by Krumsvik et al. (2013, cited in Røkenes & Krumsvik 2014) involving 17,529 students and 2,524 teachers in Norwegian secondary schools found that teachers' digital competence and students' learning outcomes are strongly correlated. This study highlights the importance of the teacher as a role model with regard to digital competence, and it further implies that the development of digital competence in student teachers needs to begin during their teacher education.

Apart from having digital skills, research indicates that teachers need to have positive attitudes toward technologies and experience self-efficacy in using them to become self-confident users and role models for students (Milbrath & Kinzie 2000). Research has also shown that the actual behavior of using technology is positively influenced by the attitude toward it as well as by the individual's self-perceptions of their competence (Yeung et al. 2012: 1319). Although the *DigCompEdu* provides a good framework for teachers to self-evaluate their digital competence, it barely addresses the relationship between student teachers' self-perceptions of digital competence and their actual attitudes toward digital technologies as well as the possible factors influencing their attitudes.

teachers  
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the role of  
attitudes  
and self-  
efficacy

In this regard, the study presented here aims to fill this gap and advance the understanding of research in future students' expertise and attitudes toward digital technologies (DT) in EFL education. Specifically, the following three research questions (RQ) are being sought:

- ▶ **RQ 1:** What are the general attitudes and the degree of their perceived digital competence of student teachers toward the use of digital technologies in ELT?
- ▶ **RQ 2:** What are the relationships between the self-perceptions of student teachers' digital competence and their attitudes toward digital technologies?
- ▶ **RQ3:** To what extent do factors including age, gender, school types, and teaching experience influence the attitudes of student teachers toward DT?

### 3.2 Design, Make-up, and Context of the Study

When second language teachers and researchers survey opinions, beliefs, and attitudes, they tend to make use of Likert-type scales (DeVellis 1991). Since the purpose of the present research is to explore future teachers' attitudes and their self-reports of their digital competence, a questionnaire based on Likert-type scales was designed (Figure 1).

designing  
the ques-  
tionnaire

#### Section (1): Digital Competence

Instructions: Please read each statement and then click the number which best shows how strongly you disagree or agree. Please respond to every statement.

\* 1. I can create new digital educational resources.

Completely Agree  1  2  3  4  5  6  Completely Disagree

\* 2. I can equip learners with a positive attitude towards digital technologies.

Completely Agree  1  2  3  4  5  6  Completely Disagree

Figure 1: Example of using Likert-type scales in the questionnaire

The questionnaire consisted of three sections: (1) self-perceptions of student teachers' digital competence, (2) student teachers' attitudes toward digital technologies and (3) demographics. The total number of items is 52. Each of the first two sections was made up of 22 6-point Likert scale items (1=Completely Agree, 2=Mostly Agree, 3=Slightly Agree, 4=Slightly Disagree, 5=Mostly Disagree, 6=Completely Disagree). We did not adopt the commonly used Likert scale with 5 or 7 responses with a neutral midpoint, because a 6-point Likert scale tends to have a higher degree of discrimination and reliability than a 5-point one (Chomeya 2010) and increases measurement precision. By way of having no middle category, respondents are urged to make a decision outside of the frequently preferred middle ground, which could

reduce the production of construct-irrelevant variance (Nemoto & Beglar 2014). Items in the first two sections are based on six constructs and 4 constructs respectively which will be presented in 3.3. The order of the items was mixed up to avoid monotony and participants' unconscious tendency to repeat their previous choices. The third section of the questionnaire mainly included demographic information such as gender, age, and years of receiving pre-service or in-service teacher education.

This study was first piloted using the print versions of the questionnaire in an advanced TEFL seminar on Oct. 16th, 2019 with 16 participants from a university in Bavaria. According to the feedback in terms of clarity, format, and length, the questionnaire was revised and transferred into a digital version by using <https://www.wjx.cn/>, which is an online website to create questionnaires. Then the official survey was conducted by asking student teachers to scan the QR code or type in the link generated by the website in two lectures on Nov. 5th, 2019 as well as in a seminar on Nov. 19th, 2019. The preliminary analysis of the collected data was shown to the student teachers near the end of the lectures as incentives for their research participation. The number of valid responses is 181.

### 3.3 Explaining the Constructs of the Questionnaire

The 22 items concerning perceived digital competence in the first section were constructed in consonance with the six dimensions stated in the *DigCompEdu framework* that have been introduced above. The questionnaire items were grouped in six constructs as follows:

The order in which the items appear in the list below reflect their linear order and their association with their respective construct. In the survey that was administered to the respondents of this study, the items were disconnected from their constructs and mixed up – hence the non-linear order of numbers you find below. In the subsequent evaluation, all items were sorted back into the original order.

If you can annotate this document, score yourself with the following questions.  
1 = strongly agree, 6 = completely disagree

#### Professional Engagement

- w7. I can use digital technologies to collaborate with others, such as sharing English teaching ideas using Dropbox.
- w8. I use digital sources and resources for my professional development in my teacher training, such as attending online lectures or watching online tutorials.
- w16. I can critically reflect on my own digital English teaching practice.

conducting  
the survey

digital  
competence:  
constructs



### Digital Resources

- w1. I can create new digital educational resources.
- w3. I can implement digital devices and resources in the English teaching process.
- w4. I can correctly apply privacy and copyright rules when using digital resources.
- w11. I can modify digital educational resources.
- w13. I can select appropriate digital resources for English teaching and learning.

### Teaching and Learning

- w12. I can use digital technologies to encourage communication among learners.
- w14. I can offer support to learners with digital technologies.
- w17. I can help learners take more control of their own English learning with digital technologies.
- w18. I can design the use of digital technologies in lesson planning.

### Assessment

- w9. I can use digital technologies to assess English learning.
- w15. I can analyze digital evidence on learners' progress critically.
- w21. I can use digital technologies to provide targeted feedback to learners.

### Empowering Learners

- w5. I can use digital technologies to make learners more engaged with English learning.
- w6. I know how to provide alternative digital tools for learners with special needs, e.g. visual or hearing impairments.
- w22. I can design personalized learning plans to meet individual students' needs with the help of digital resources.

### Facilitating Learners' Digital Competence

- w2. I can equip learners with a positive attitude toward digital technologies.
- w10. I can encourage students to solve technical problems.
- w19. I can encourage learners to search for digital content.
- w20. I can help students express themselves in English through digital means.

The second section is composed of four constructs and 22 items targeting student teachers' attitudes toward digital technologies. Three items in the first construct are reverse items denoted by REV. Reverse items are the opposite of other items in terms of meaning and need to be reversely scored, i.e. 1=completely disagree and 6=completely agree in this study. They are used to prevent the respondents from answering the questionnaire too carelessly.

attitudes  
toward  
digital  
technolo-  
gies: con-  
structs

1 = strongly agree, 6 = completely disagree (REV = reverse if needed)

### Personal Feeling toward Digital Technologies

- w23. I am confident in my skills in using digital technologies.
- w25. I feel comfortable when using digital technologies.
- w28. Learning about digital technologies and using them is a waste of time. (REV)
- w34. I enjoy using digital technologies in learning and teaching.
- w36. I am worried about my data privacy. (REV)
- w44. I think digital technologies save my time and effort.
- w40. I think digital technologies are too distracting. (REV)

### Attitudes toward Digital Technologies in Teaching and Learning

- w27. Digital technologies make the classroom a better place.
- w32. Digital technologies make English learning and teaching easier.
- w33. Digital technologies can help communication between the students and myself both in and out of the classroom.
- w37. Digital technologies must be used in current English learning and teaching.
- w38. I think digital technologies can help form better assessments.
- w43. I think digital technologies are appropriate for many English learning activities.

### Attitudes toward the Influence of Digital Technologies on Students

- w26. I think digital technologies can motivate students.
- w31. I think digital technologies can satisfy students' diverse needs.
- w39. Digital technologies can improve learner autonomy.
- w42. I think digital technologies are useful for students' English learning.

### Willingness to Use

- w29. I think I will keep up with the new developments in digital technologies.
- w30. I am willing to improve my skills in using digital technologies.
- w41. I think digital technologies have greatly improved my learning and teaching and will continue to do so in the future.
- w24. I should improve my digital competence in order to improve my future students' digital competence.
- w35. I think I can become a better English teacher with the help of digital technologies.



#### How positive are your digital attitudes?

After going through the questionnaire items of digital attitudes above, reflect for yourself: Are you confident and comfortable using digital technologies? If not, why? What are your concerns and worries regarding the use of digital technologies in teaching and learning? **Answer this if you like on the discussion board**

Skip to section 3.5, unless you are interested in the research methodology.

### 3.4 Results of the Study

To test the three research questions (RQ), we first established a framework as the guideline for data analysis (Figure 2) and then the data analysis was conducted with the help of an online SPSS website [www.spssau.com](http://www.spssau.com) offering a ‘Statistical Package for the Social Sciences’ (cf. Grum & Zydatiř 2016).

framework for data analysis

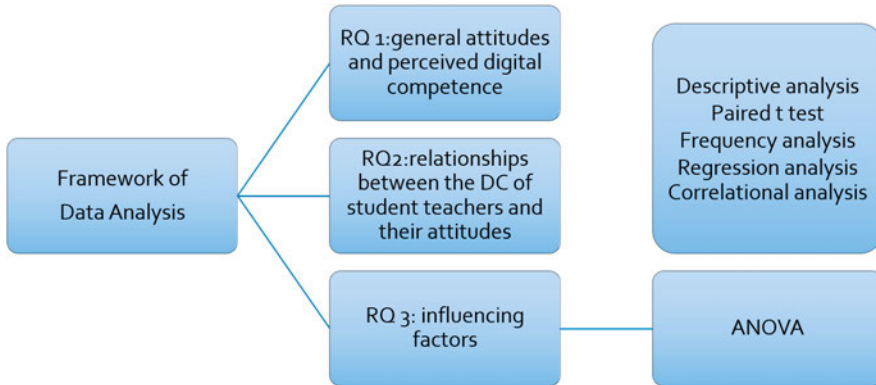


Figure 2: Framework for the data analysis

The reliability analysis showed that the value of Cronbach  $\alpha$  was 0.908, which meant the internal consistency of the questionnaire is excellent and the data could be used for further analysis. We used both parametric and non-parametric analyses. Usually, parametric analyses are adopted when the data are normally distributed and non-parametric analyses do not require the normal distribution. A normal distribution has a symmetric bell shape with equal mean and median located on the center of the distribution. Although the normality test showed that all data collected in this survey did not follow a normal distribution, parametric tests are “sufficiently robust to yield largely unbiased answers that are acceptably close to ‘the truth’ when analyzing Likert scale responses” (Sullivan and Artino, 2013).

#### Cronbach’s Alpha: the most commonly used reliability analysis

It is important to “calculate and report Cronbach’s alpha coefficient for internal consistency reliability for any scales or subscales one may be using” (Gliem and Gliem, 2003). The rules of thumb provided by George and Mallery (2003) indicate that a Cronbach’s  $\alpha$  value above 0.70 was considered as the threshold to test for internal consistency.

Cronbach’s alpha	Internal consistency
$\alpha \geq 0.9$	Excellent



Cronbach's alpha	Internal consistency
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

(Source: <https://www.statisticshowto.com/cronbachs-alpha-spss/>)

RQ1: attitudes and self-perception of digital competence

RQ 1 sought to ask about the student teachers' general attitudes toward digital technologies and their self-perceptions of their digital competences. We created two new variables by grouping the 44 items in the first two sections and conducted a descriptive analysis. The results (Table 1) revealed that the average score for their perceived digital competences was 2.630 and the mean for their digital attitudes was 2.375, both of which were below 3 (between "2-mostly agree" and "3- slightly agree"). The student teachers' digital attitudes were more positive than their digital competences perceived by them, and the difference was significant as the results of the paired t-test analysis show in Table 2. A t-test is a statistical test for hypothesis testing which shows how significant the differences between the means of two groups are. The significance could be told from the P-value, with  $P < 0.05$  being statistically significant and  $P < 0.001$  highly significant. In this case, the two groups refer to the two variables: attitudes toward digital technologies and self-perceptions of digital competences.

Descriptive Analysis-Basic metrics						
Title	N of sample	Min	Max	Mean	Std. Deviation	Median
Digital Competence	181	1.136	4.773	2.630	0.648	2.591
Digital Attitudes	181	1.136	5.136	2.375	0.658	2.273

Table 1: Descriptive analysis on digital competence and attitudes

Results of Paired t test Analysis					
Name	Paired(Mean±Std. Deviation)		Mean difference(Paired1 -Paired2)	t	p
	Paired1	Paired2			
Digital Attitudes Paired Self-perceptions of one's digital competences	2.35±0.60	2.63±0.65	-0.28	-6.529	0.000**
* p<0.05 ** p<0.01					

Table 2: Paired t test analysis on digital competence and attitude

Sullivan and Artino (2013) argued that means are often of little value when data do not follow a classic normal distribution and in this case a frequency distribution of responses will likely be more helpful. The results of the frequency analysis in Figure 3 reveal that 90 % of student teachers had positive attitudes toward DT (34.8%+55.2%) and 75.7% of them had positive self-perceptions of their digital competences (18.2%+57.5%).

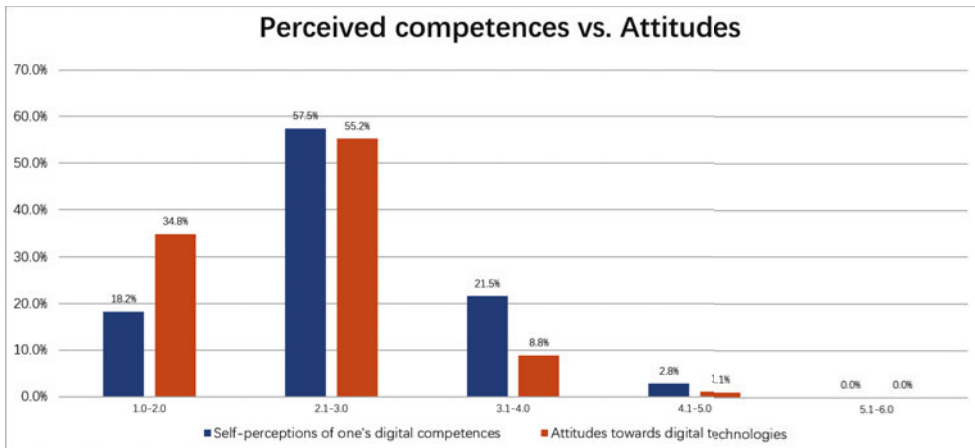


Figure 3: Frequency analysis of perceived competences and digital attitudes

Figure 4 shows a more detailed distribution of responses concerning the constructs within digital competences. Nearly 90 % of the student teachers (57%+29%) were confident in their competence of using digital technologies to promote their professional engagement, the highest among all six constructs. Over 80 % of them agreed that they could use digital technologies to facilitate learners' digital competence (39%+44%) and enhance teaching and learning (35%+46%). 76 % of them thought they could use digital technologies in the assessment of learners. But when it comes to digital resources, the number of participants who had positive perceptions dropped to 65 %. The most

divided results were about empowering learners, with only 50 % of them perceiving that they were competent in this area.

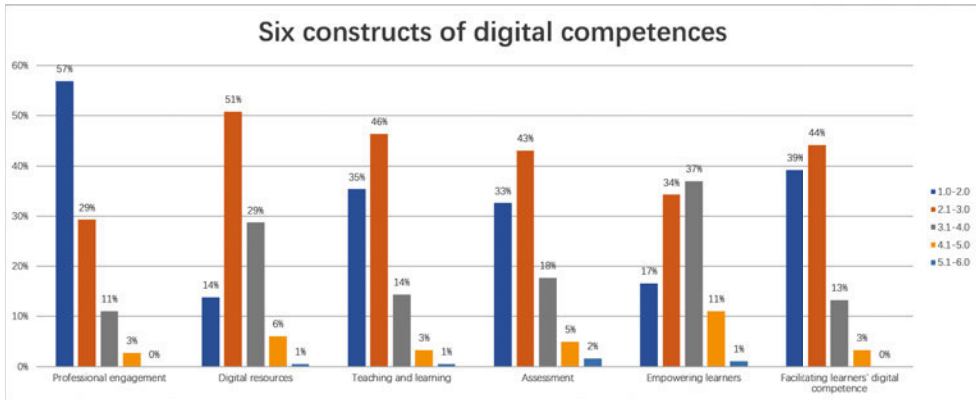


Figure 4: Frequency analysis of perceived digital competences

The frequency analysis of the four constructs regarding student teachers' attitudes toward DT (Figure 5) reveals that 94 % of the participants (60%+34%) held positive attitudes toward the influence of DT on students and nearly 93 % of them were willing to use DT in their future classrooms (55%+38%). Yet they seemed to be more skeptical about data privacy and distraction, reflected in the less positive personal feelings toward DT.

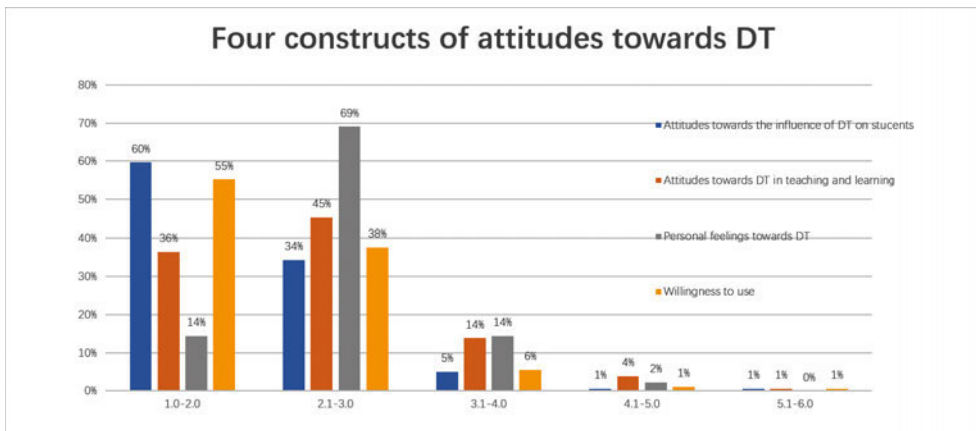


Figure 5: Frequency analysis of attitudes toward digital technologies



RQ2: relationship between self-perceptions of digital competence and attitudes

### Data analysis - Terminology

**Correlation** is the degree of association between random variables. However, correlation is not the same as causation. Mathematically, a correlation is expressed by a correlation coefficient that ranges from  $-1$  (never occur together), through to  $0$  (absolutely independent) and to  $1$  (always occur together).

**Regression analysis** involves identifying the relationship between a dependent variable and one or more independent variables. The estimated regression equation can be used to predict the value of the dependent variable in view of the influence exerted by the value of the independent variables.

The **independent variable** is the one which is controlled in an experiment, but does not depend on other variables (e.g., age). The **dependent variable** is the one that changes in response to the independent variable. Their relationship could be simplified as cause and effect: the change in the independent variable will affect the dependent variable.

To identify the relationship between the two variables of student teachers' self-perceptions of their digital competence and their attitudes toward DT, correlation analyses and regression analyses were conducted.

As is indicated in Table 3, the correlation coefficients (Pearson  $r$ ) for the ten constructs are all above  $0$  ( $p < 0.01$ ), which concludes that student teachers' perceived digital competence and their attitudes are positively related and the relationship is statistically significant. The relationships are found to be remarkably strong ( $>0.500$ ) especially between "Attitudes toward the influence of DT on students" and "Facilitating learners' digital competence" ( $0.530$ ), between "Willingness to use" and "Facilitating learners' digital competence" ( $0.567$ ) as well as "Teaching and learning" ( $0.503$ ), and between "Personal feelings toward DT" and "Digital resources" ( $0.559$ ).

	Attitudes towards the influence of DT on students	Willingness to use	Attitudes towards DT in teaching & learning	Personal feelings towards DT
Facilitating learners' digital competence	0.530**	0.567**	0.463**	0.499**
Empowering learners	0.214**	0.218**	0.219**	0.266**
Assessment	0.297**	0.358**	0.349**	0.423**
Teaching and learning	0.433**	0.503**	0.388**	0.453**
Digital resources	0.341**	0.354**	0.340**	0.559**
Professional engagement	0.286**	0.320**	0.262**	0.390**

\* $p < 0.05$  \*\*  $p < 0.01$

Table 3: Correlation analysis on perceived digital competence and attitudes

In order to more accurately describe the relationship between the two variables, two regression analyses were carried out: one with the attitudes as the dependent variable and the digital competence as the independent variable, and another analysis with the two variables exchanged. According to Table 4, when the “self-perceptions of one’s digital competences” is the dependent variable, and the four constructs of digital attitudes are independent variables, the value of  $R^2$  is 0.374, which means “attitudes toward DT” can account for 37.4% of the reasons for the change of “Self-perceptions of one’s digital competences”. The regression coefficients indicate that “Personal feelings toward DT” ( $t=5.649$ ,  $p=0.000<0.01$ ), “Willingness to use” 0.202 ( $t=2.145$ ,  $p=0.033<0.05$ ) will produce significant positive effects on “Self-perceptions of one’s digital competence” of student teachers.

Results of Regression Analysis (n=181)									
	Unstandardized Coefficients		Standardized Coefficients	t	p	VIF	$R^2$	Adj $R^2$	F
	B	Std. Error	Beta						
Constant	0.828	0.187	-	4.428	0.000**	-	0.374	0.359	F (4,176)=2 6.253, p=0.000
Attitudes towards DT in teaching & learning	-0.05	0.085	-0.064	-0.593	0.554	3.247			
Attitudes towards the influence of DT on students	0.123	0.095	0.138	1.292	0.198	3.205			
Personal feelings towards DT	0.475	0.084	0.409	5.649	0.000**	1.473			
Willingness to use	0.202	0.094	0.223	2.145	0.033*	3.033			
Dependent variable: Self-perceptions of one's digital competences									
D-W: 2.276									
*p<0.05 **p<0.01									

Table 4: Regression analysis (Dependent variable: perceived digital competences)

Table 5 shows that perceived digital competences could predict 38.8% of the change in attitudes ( $R^2=0.388$ ), which means the more competent the student teachers perceived themselves to be, the more positive attitudes they would hold. However, among the six constructs of digital competence, only “facilitating learner’s digital competence” ( $t=4.786$ ,  $p=0.000<0.01$ ) will have a significant, positive effect on the attitudes.

Results of Regression Analysis (n=181)									
	Unstandardized Coefficients		Standardized Coefficients	t	p	VIF	R <sup>2</sup>	Adj R <sup>2</sup>	F
	B	Std. Error	Beta						
Constant	1.067	0.16	-	6.67	0.000**	-	0.388	0.367	F (6,174)=18.403, p=0.000
Facilitating learners' digital competence	0.32	0.067	0.418	4.786	0.000**	2.173			
Empowering learners	-0.047	0.05	-0.071	-0.938	0.35	1.638			
Assessment	0.037	0.057	0.055	0.654	0.514	2.045			
Teaching and learning	0.112	0.074	0.156	1.518	0.131	3.015			
Digital resources	0.11	0.068	0.137	1.622	0.107	2.034			
Professional engagement	-0.018	0.055	-0.024	-0.318	0.751	1.664			
Dependent variable: Digital Attitudes									
D-W: 2.220									
*p<0.05 **p<0.01									

Table 5: Regression analysis (X=attitudes towards DT as dependent variable, Y=six constructs of digital competence as independent variables). The result of regression analysis is an equation where the coefficients represent the relationship between each independent variable and the dependent variable.

To conclude, the correlation analysis and regression analysis show that student teachers' self-perceptions of their digital competence were closely related to their attitudes toward DT and both variables affect each other positively. A positive coefficient in the regression analysis suggests that the mean of the dependent variable tends to increase with the increase of that of the independent variable. Perceived digital competence had a slightly stronger impact on attitudes (0.388) than attitudes had on digital competence (0.374).

In order to find out whether factors such as age, gender, school types, and teaching experience may influence the attitudes and self-perceptions of student teachers toward DT, a one-way ANOVA analysis was used (with ANOVA standing for Analysis of Variance). This type of analysis is conducted to assess the interrelationship of two or more independent variables on a dependent variable. The one-way ANOVA analysis results are as follows:

RQ 3: influencing factors

- ▶ Gender and years of pre-service teacher education may have an influence on student teachers' perceived competence and their attitudes, but other factors like age, school types, and whether student teachers were Lehramt Staatsexamen or Master of English Studies students did not make any difference.
- ▶ There was no statistically significant difference between gender and perceived digital competences on the whole, yet male students perceived themselves to be

more digitally competent in facilitating learners' digital competence ( $p=0.005$ ), creating digital resources ( $p=0.025$ ) and promote their professional engagement with digital technologies ( $p=0.014$ ).

- ▶ Student teachers with more years of pre-service teacher education had significantly less positive attitudes toward DT than students with no or less than one-year experience of pre-service teacher training ( $p=0.040$ ).

### 3.5 Discussion of the Results

Our findings show that student teachers had a very high degree of positive attitudes toward the role of digital technologies in English teaching and learning and its influence on students. These results seem to be inconsistent with the notion that teachers tend to be reluctant in using digital technologies in the classroom. A large majority of student teachers were in fact willing to use them in their (future) teaching and learning, even though only 14 % of the student teachers strongly or completely agree with the items under the construct "Personal feelings toward DT." For instance, despite their concern about data privacy issues, student teachers are still willing to use digital technologies.

Admittedly, having positive attitudes toward technology does not inevitably contribute to a change in behavior to integrate technology more in the classroom, or in a better way (Belland 2009). In other words, teachers may still choose not to use it in the classroom even if they have highly positive attitudes. Other variables may also influence teachers' actual behavior, including their competence. Thus, it is not surprising that perceived digital competences of student teachers toward digital technologies were less positive than their attitudes. For example, over one-third of prospective teachers were not highly confident about their ability to create and modify digital resources. Moreover, half of the future teachers especially did not know how to facilitate learners with special needs. As Florian (2004: 18) argued, Information and Communication Technologies (ICT) offer both opportunities and challenges to learners with special needs. Technology can be used to reduce the effects of possible barriers to learning or participation for students with impairments, but student teachers, without any exposure to this issue, may feel overwhelmed by the challenges of making special adaptations for these learners to have access to technology. These concerns about their competence may pose a direct obstacle to transferring their upbeat attitudes into actions. Certainly, there is also a strong call for teacher education to showcase the didactic potentials of digital technologies as a basis for transferring competence into actual behavior.

The correlation and regression analysis showed that prospective teachers' perceptions of their digital competence were closely related to their attitudes and these perceptions have a strong influence on their attitudes – and vice versa. This finding is in line with the previous research on in-service teachers (Jegede et al. 2007; Kibirige 2011). More specifically, student teachers who participated in our survey and perceived themselves as capable of facilitating learners' digital competence have more positive

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digital attitudes. Those who have positive personal feelings and a high willingness to use digital technologies have better self-perceptions of their digital competence. The findings suggest that prospective teachers may become more positive toward digital technologies if they know how to help their learners to improve their digital competence, or see the actual positive change of their learners for themselves. Besides, the change in one's personal feelings and willingness to use digital technologies causes a shift in his or her perceived digital competence.

Gender also seems to be an important influencing factor regarding attitudes toward digital technologies. Female participants tend to have less favorable attitudes toward digital technologies. This finding is in line with the study done by Cai et al. (2017). They conducted a meta-analysis of 50 articles on gender differences in the attitude toward technology use from 1997 to 2014. Their results showed that males still held a more positive attitude toward technology use than females and that there was only minimal reduction in the gender attitudinal gap. In terms of perceived digital competence, although there is no *significant* difference between female and male students in general in our study, men still had a better self-perception about their ability to deal with digital resources, promoting their professional engagement with digital technologies as well as facilitating learners' digital competence. The results indicate that some form of digital divide may also exist in the form of a gender gap. It would be difficult, however, to find exact reasons for such a gap, and it might be possible that respondents are transporting gender-specific socializations into their questionnaires – thus reproducing stereotypes they hold about attitudes and self-perceptions with regard to technology. Since gender-specific self-perceptions seem to prevail, it will remain important for teacher education not to reproduce such gender-digital divides, challenge them whenever they become visible, and increase self-efficacy in the use of digital technologies irrespective of gender ascriptions. \* good point here about gender stereotypes

gender influences

Interestingly, it was also found that student teachers with no or less than one year of pre-service training had more positive views than students who received more than one year of teacher training. This finding suggests that pre-service teachers tend to develop more doubts about the usefulness and convenience of digital technologies as they receive more teacher training. They also had better self-perceptions of digital competence, though the result was not significant. Another similar interesting result was found by Instefjord and Munthe (2017). In their research regarding how pre-service teachers perceived the education program they received in the final year of their four-year program with an emphasis on digital competence, they found these student teachers were fairly critical of the program, but favorable toward their competence. Such a finding suggests that – with years of training and experience – teachers develop an increasingly reflective and critical compass for orientation in the field of digital education, without rejecting technology per se.

years of experience: a critical compass

#### 4 Implications for Teacher Education and Teacher Development

The emergence of the *DigCompEdu framework* as a European initiative – as well as the results of the empirical study presented in this article – indicate that the digital competence of educators will continue to remain a significant concern and field of action within teacher education both globally and nationally. This tendency is mirrored, for example, in other documents such as the strategy paper *Bildung in der digitalen Welt* of the German KMK, or the Chinese *Education Informatization 2.0 Action Plan*. To bring the digital competence of educators to life effectively, several implications can be mapped out which are based on the introduction into the *DigCompEdu framework* and the empirical results of the study with pre-service teachers offered in this article.

(1) The digital competence of educators is part and parcel of a life-long professional development. On one level, this is because digital learning and teaching is most likely not a “trend” that will disappear, but a dimension of education that will become increasingly integral to schools and classrooms. On another level, the digital world is constantly shifting and changing, with ever new developments. Not only do these shifts mark the need to stay up-to-date. More importantly, they stress the need for teachers to have a critical compass in their professional repertoire that helps them judge the value and usefulness of digital tools and resources (rather than embracing each new development in an instant and euphoric frenzy).

**Do you think you are ready to analyze and adapt/adopt future technologies?**

The COVID-19 pandemic has marked a drastic shift to education occurring digitally and online, which certainly was an urgent necessity that, over time, turned into a ‘new normal’ in many cases: To weather the crisis, teachers had to master the transition from their brick-and-mortar classroom teaching to remote teaching in synchronous or asynchronous formats. Suddenly, the digital competence of educators moved into focus as a must-have – rather than being an optional addition. And still, in less drastic times and contexts, the ongoing digitalization of lifeworlds at large and schools and classrooms in particular also indicates the centrality of educators’ digital competence.

(2) The study has shown that pre-service EFL teachers, i.e. the teachers of the future, bring important initial stepping stones towards a more full-fledged digital competence into their professional development. Their generally high positive attitudes towards digital education, and their favorable command over digital tools based on their self-assessment, indicate a valuable professional trajectory that can be developed further with hands-on experience, critical reflection and a self-monitoring of one’s own progress. Certainly, this is also a call to action directed at teacher education programs at universities where the potentials of digital education can be discovered with student teachers.

**What other digital tools and services have you used at HUFs? Was there anything that was particularly novel, effective or interesting?**

(3) Even though the *DigCompEdu* is in itself not an EFL-specific framework, the diversity of descriptors, articulations of sub-dimensions, and concrete examples are a good starting point for a more rigorous transfer into EFL education. Such a transfer must consider that digital competences are no stand-alone competences as if they were somehow unrelated to EFL education, neatly compartmentalized in a 'separate box'. Instead, we argue that they must be seen as transversal, cutting across key concerns of EFL education such as language learning and communication, intercultural learning, working with texts and literature, or differentiated teaching. This means that digital dimensions should always be considered when teachers design learning processes and scenarios, for example, when

future directions for EFL teaching and learning

- ▶ speaking about current social developments in Anglophone contexts necessitates an exploration of how such developments unfold in social media and hashtags;
- ▶ becoming a fluent communicator today means to be fluent in digital and multimodal communication channels;
- ▶ developing into a reader today requires the capacity to read (and view) digital posts, newsfeeds, YouTube videos, digital games, or interactive fiction.

(4) The fourth implication addresses the need to develop strategies for digital education in the school institution as a whole. Indeed, the *DigCompEdu framework* stresses the need to

transforming schools

- ▶ diversify the use of digital technologies and resources available at a school while putting them to meaningful use in classrooms,
- ▶ share experience of digital teaching, and exchange good examples of digital resources, within the professional communities of teachers,
- ▶ constantly reflect, critique and renew digital teaching and learning practices of the institution, especially where educators become innovating *Pioneers* (at the C2 level).

Ideally, such innovation and progress are not achieved by one teacher alone, but as a collaborative effort shared and developed by many. Depending on the digital challenge in question, some teachers might require guidance that other teachers can offer, and vice versa. Such supportive dialogue and exchange of expertise can also unfold across subjects and subject teachers. This way, the development of digital competence in educators and within schools can become embedded in a conscious give-and-take professional culture of mutual support.

**Do you use any social platforms, messaging or forums in English? Have you communicated with people from other cultures online? How was the experience? Could you adapt this into your teaching?**

**Are there any digital tools or services that you would like to implement on an institutional level?**

## Conclusion

### Summary

Fostering digital competence is a central task of the ongoing professional development of EFL teachers, beginning with pre-service teachers at the university stage up to in-service teachers who are immediately involved in school contexts and classrooms. To achieve this task, the European *DigCompEdu framework* provides indispensable orientation and hands-on points of entry. Its value lies in connecting a teacher's (and jointly, a whole institution's) increasing digital competence with an energetic pedagogic core that puts learners at the center, including the digital innovation of new forms of learner empowerment, learning-teaching scenarios, assessment, and ultimately, crucial avenues into developing digital competences in learners. To achieve this, self-reflection and self-assessment can help teachers identify the strengths and weaknesses of their existing digital competences in light of available progression stages.

### Follow-up and Reflection: Tasks and Questions

- ▶ To get a realistic impression of your current pedagogic professionalism in the field of digital competences, you can use the competence descriptors and questionnaire items provided in this article for your own or for peer-reflection. For a hands-on result, you can also use the *DigCompEdu* "Check-In Self-Reflection Tool" to locate yourself within the steps of the progression model and retrieve impulses for your development (available via <https://ec.europa.eu/eusurvey/runner/DigCompEdu-S-EN>). **Try this link if you wish.**
- ▶ Identify areas and sub-dimensions of your digital competence that you wish to improve. Actively seek out learning opportunities to achieve your goals, e.g. in internships at schools or in the second phase of your teacher training (*Referendariat*). Constantly reflect on your own progress.
- ▶ Develop a lesson sequence on a topic of your own choice. Integrate digital resources and digital ways of teaching and learning into your sequence. Think and reflect: When is the integration of digital aspects meaningful, and what purposes do they serve? Which parts of the lesson sequence would work equally well without the digital, and why? **This is an option for your final project on this course.**

### Commented Suggestions for Further Reading

Redecker, Christine (2017). *European Framework for the Digital Competence of Educators: DigCompEdu*. Punie, Yves (ed.). EUR 28775 EN. Publications Office of the European Union, Luxembourg. ([publications.jrc.ec.europa.eu/repository/bitstream/JRC107466/pdf\\_digcomedu\\_a4\\_final.pdf](https://publications.jrc.ec.europa.eu/repository/bitstream/JRC107466/pdf_digcomedu_a4_final.pdf), last access 26 June).

- ▶ We recommend reading the full-length version of the *European Framework for the Digital Competence of Educators*. For each sub-dimension and progression level of digital competences, you can find helpful descriptions and guidance for practice. The glossary of terms is additionally helpful.

Caspari, Daniela; Klippel, Friederike; Legutke, Michael K. & Schramm, Karen (eds.) (2016). *Forschungsmethoden in der Fremdsprachendidaktik. Ein Handbuch*. Tübingen: Narr.

- ▶ This edited volume provides a thorough introduction into empirical research within foreign language didactics. It explains research concepts and approaches to data analysis in accessible ways and is therefore a good reference for student-driven research, e. g. for a master's thesis.