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Dissertation Thesis

**Professional Preparation of Future Lower Secondary School Teachers
in Using Information and Communication Technologies in the Context
of Teaching English as a Foreign Language**

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ABSTRACT

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The development and wide-spread diffusion of Information and Communication Technology (ICT) give rise to reform of education system, thereby leading to the need for digitally competent teachers. The dissertation focuses on professional preparation of future lower secondary school teachers in using ICT in the context of teaching English as a Foreign Language. The aim of the study is to expand the theories of pedagogy and to implement an empirical research survey which will provide valuable information for the improvement of pre-service EFL teacher training. The research is based on interviews, questionnaire, and data from course syllabuses. The results of the study show that there are clear differences among universities in the Czech Republic in terms of the development quality of didactically specific ICT competencies in the preparation of future primary school EFL teachers.

Key words: ICT, EFL, competence, education

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List of abbreviations

BA   Bachelor

CALL   Computer Assisted Language Learning

CK   Content Knowledge

EFL   English Foreign Language

ELT   English Language Teaching

ESL   English as a Second Language

ETS   Educational Testing Service

GDPR   General Data Protection Regulation

HR   Human Resources

ICT   Information and Communication Technology

IPA   International Phonemic Alphabet

ISTE   International Society for Technology in Education

LT   Language Teaching

LMS   Learning Management System

OECD   Organization for Economic Cooperation Development

SLA   Second Language Acquisition

PCK   Pedagogical Content Knowledge

PK   Pedagogical Knowledge

TPK   Technological Pedagogical Knowledge

TCK   Technological Content Knowledge

TPCK   Technological Pedagogical Content Knowledge

TK   Technological Knowledge

UNESCO   United Nations Educational, Scientific and Cultural Organization

1 INTRODUCTION

The twenty-first century has witnessed an unprecedented development of information and communication technology (ICT). We are surrounded by a variety of digital technologies such as smartphones, tablets, digital cameras, audio equipment, computers, videos, projectors, interactive whiteboards, etc. And new technology emerges nearly every day. ICT influences us almost in every aspect of our lives. With social media such as Facebook, Messenger, WhatsApp and the like, people can communicate with each other no matter how far they are from each other under the condition that the Internet connection is available. With the Internet and computers, we can access rich publications and books related to our study. With smartphones and tablets, we can learn without restrictions of time and place. With computer technology, people can work from home and meet via online conferences. With modern technology, people can do shopping online. It goes without saying that ICT has influenced our lives profoundly.

ICT not only affects communication among people, research, learning, work and daily lives, but also has an impact on education system. In fact, education system has undergone profound changes evidenced by changes in teaching environment, teaching forms, teaching materials and frequency of interaction between students and teachers, etc. "Traditional conceptions of what constitutes a classroom, the role of a teacher and the quality of teacher knowledge have been challenged by the emergence of new technologies" (İşler and Yildirim, 2018, p. 147). Compared to traditional classrooms which are usually characterized by blackboard and chalk, today's classrooms are equipped with computers, the Internet, interactive whiteboards, educational software, projectors, cameras, etc. Under the circumstance, teachers are required to develop knowledge and skills in integrating ICT in teaching (Lawless & Pellegrino, 2007). That is to say, teachers should be aware of integrating ICT into teaching practice to enhance teaching and student learning (Lawless & Pellegrino, 2007). "English teaching and learning is one of the subdomains experiencing the introduction and integration of various types of technologies" (Jahanban-Isfahlan et al., 2017, p. 1). It becomes a mandatory requirement that language teachers are able to use the technology effectively in their teaching practice (Solak & Cakir, 2014). Studies have shown that ICT, if used

properly, can greatly enhance teaching and learning (Titova, 2012; Chen, 2013; Wang et al., 2015; Alhinty, 2015; Ashraf et al., 2014) because digital tools can help teachers and students access rich educational resources. Besides, with digital technology, teachers can create an authentic language learning environment for students to practice the target language. (Alberth, 2013).

1.1 Digitization of Education as the 21st Century Trend

As many studies have indicated that ICT can facilitate active classroom teaching and benefit outcomes of teaching and learning (Barak et al., 2016, Barrs, 2012, Wang et al., 2015), governments from all over the world have attached much importance to the integration of modern technology into education. For instance, the U.S. Department of Education issued the "National Education Technology Plan 2010" to apply various types of technology used in our daily lives to the whole education system to improve teaching and student learning. The strategy is designed to improve technology infrastructure, including hardware and software, in all educational institutions and increase professional development of teachers at all levels of education (U.S. Department of Education, 2010). The UK Department for Education made an educational strategy in 2019 called "Realizing the Potential of Technology in Education: A Strategy for Education Providers and the Technology Industry". The strategy highly regards the role of educational technology in improving teaching and learning. The strategy aims to improve digital infrastructure in educational settings and develop the awareness, knowledge and skills needed for successful integration of technology in education. In other words, the strategy aims to secure digital infrastructure and develop digital capability and skills of teachers. In parallel, the government supports a high technology enterprise in the UK to provide schools with high-quality of educational technology (UK Department for Education, 2019). China also has issued educational strategies. In 2012, China's Ministry of Education issued the education digitalization plan – the "Ten-Year Plan of Educational Digitalization (2011-2020)" in order to enhance the integration of technology into education. Particularly, the plan aims to promote the universal application of ICT in teaching, innovate ICT-based teaching and learning methods to enhance level of interactive teaching, achieve students' equal access to digital technology, develop teachers' technological competence of all subjects. It is noteworthy that teachers' technological competence has been regarded as one of

the standards of teacher qualification (China's Ministry of Education, 2012). In 2019, China's State Council issued "China Education Modernization 2035" in order to innovate teaching model in response to the development of information technology. It was pointed out in the document that modern technology should be used effectively in the teaching process to develop students' critical thinking, problem solving skills and creative skills. The document emphasizes that education informatization is regarded as a powerful force for education modernization (China' State Council, 2019). In 2014, the Czech Republic issued the document "Strategy for Education Policy in the Czech Republic until 2020" which includes the "Strategy for Digital Education" developed by the Ministry of Education, Youth and Sports. The aim of this strategy is to improve digital infrastructure in schools, develop digital competence of teachers and students and achieve effective integration of technology in education (Ministry of Education, Youth and Sports of the Czech Republic, 2014). Under these educational policies, it is not surprising that many schools worldwide are equipped with a high variety of digital technologies such as computers, projectors, language laboratories, interactive whiteboards, digital networks, etc.

1.2   The Role of Teachers in Integration of ICT into Education

As mentioned above, governments worldwide have made investments in technology in educational institutions. "The increase in the availability of digital technology in schools and classrooms makes it important for teachers to be prepared to effectively integrate technology into their instructional practice" (Lawless & Pellegrino, 2007, p. 580). However, studies have indicated that although schools are rich with different kinds of technologies, technology is rarely used in schools (Røkenes and Krumsvik, 2016) or is not used effectively to improve teaching and student learning (Ertmer & Ottenbreit-Leftwich, 2010). For instance, Dostál et al. (2017a) conducted an investigation into the extent of teachers' use of ICT tools for experiments. 260 basic and secondary school teachers were involved. The study showed that 47 % of teachers did not use computers for experiments, and 27 % of teachers used them insufficiently. The result also indicated that most teachers did not use computers for experiments even in the science-based subjects in which ICT should have been used for teaching. Jahanban-Isfahlan et al. (2017) found out that educational technology is rarely used by English foreign language (hereafter 'EFL') teachers at high schools in Iran. Chaaban

and Ellili-Cherif (2016) also examined EFL teachers' use of technology in the classroom. The respondents included 263 EFL teachers in Qatari Independent Schools. The result showed that technology was used for content delivery or preparation. Similarly, a study by Røkenes and Krumsvik (2016) indicated that interactive whiteboards were frequently used as a screen for PowerPoint presentation at schools. "Using PowerPoint to present a lesson or searching the Web for information resources is regarded as low-level use of technology" (Ertmer & Ottenbreit-Leftwich, 2010, p. 257). Beyond that, Buabeng-Andoh (2019) studied teachers' use of ICT in teaching in the context of Ghana. He found out that secondary school teachers rarely used ICT in teaching practice. He also discovered that most teachers used ICT for the basic activities such as finding information on the Internet or browsing websites. Brun and Hinostroza (2014) studied how students were prepared to use technology for future teaching activities in teacher education institutions in the context of Chile. The results showed that although technologies, such as interactive whiteboards, video-conferencing system, were available in the teacher education institutions. They were rarely used by teachers to prepare students (future teachers) for effective use of ICT in future teaching activities. Student teachers felt that their knowledge of pedagogical use of technology in teaching was not enough. The student teachers in the study claimed that their teachers always required them to make PowerPoint presentation, and this was the only resource they used. Studies conducted in Saudi Arabia, Greece, Vietnam, USA, Jordan also indicated similar findings (Alenezi, 2015, Alzaidiyeen et al., 2010, Nikolopoulou & Gialamas, 2015, Peeraer & Petegem, 2015, Shapley et al., 2010). Although there exist various factors affecting the unsuccessful and ineffective use of ICT in classroom teaching, studies have found that teachers' ICT competence is an important factor. A study by Røkenes and Krumsvik (2016) indicated that interactive whiteboards were frequently used as a screen for PowerPoint presentation because teachers lacked knowledge of the real affordances in the interactive whiteboards. This finding is consistent with Holmberg's (2016) conclusion that teachers need knowledge of "technical know-how" (p. 2333). "The lack of competence of teachers in using the entire didactic potential of modern ICT hinders the process of informatization of education in general, and the intensification of teaching specific subjects in particular" (Sysoyev & Evstigneev, 2014, p. 83). The successful integration of technology in classroom teaching is not only concerned with computer hardware and software, rather, it is closely related to teachers' digital competence (Bransford et al., 2000). Teachers' competence significantly affects

the quality of education (Dostál, 2018). In other words, "the final point of educational change, that is, classroom change lies in the teachers' hands" (Jahanban-Isfahlan et al., 2017, p. 1). Therefore, studying teachers' ICT competence is important. In this study, teachers' ICT competence refers to knowledge and skills of, as well as attitudes towards innovative ICT-use in teaching. "Innovative ICT-use" means to effectively integrate ICT in teaching to enhance teaching and support student learning, instead of basic ICT-use, such as teachers' using technology for content delivery, finding information, or doing e-mail (Lawless & Pellegrino, 2007).

1.3   Research Questions and Aims

This research attempts to study future EFL teachers' ICT competence. In the study, the future EFL teachers refer to those who are currently studying in a teacher education program in universities and they will teach at lower secondary schools after their graduation. On the one hand, English has become the main international language and has been included as a mandatory subject in many schools and universities worldwide. Studies have indicated that ICT can facilitate English teaching and learning (Titova, 2012; Chen, 2013; Wang et al., 2015; Alhinty, 2015; Ashraf et al., 2014). It is undeniable that the big challenge of learning English is a lack of an authentic English spoken environment which is very important for language learning. With ICT, real authentic environments can be created, in which students can experience real learning environments and communicate with native speakers. For instance, through YouTube, students can watch videos and movies with English native speakers' voice. Through Facebook and the Internet, students can communicate with English native speakers. One the other hand, from the literature review we can see that the existing studies mainly focus on in-service teachers' ICT competence. Research on pre-service teachers' ICT competence is very rare (Wang et al., 2020). In fact, pre-service teachers also play an important role in ensuring successful integration of technology in their future teaching career. If they are well prepared to teach with respect to ICT competence after their graduation, the quality of teaching can be ensured to some extent. Therefore, it is important to study their ICT competence to ensure effective use of technology in education and the quality of education.

Even though at present the issue has been discussed throughout the world, in our dissertation thesis, we primarily focus on the Czech Republic. Our research is inspired

by the revisions of educational frameworks in the Czech Republic which are being carried out at the moment. They represent the key curricular documents as they co-create a particular form of school education. Above all, the revisions deal with ICT in educational fields which have been recently divided into two distinct subjects— computing and digital literacy (NUV, 2018). The latter is put into effect through an intensive implementation of digital technology to all school subjects, including English as a foreign language. The revisions significantly change the current education system and thereby they represent a new challenge to teachers. Therefore, it is more than necessary to reform university preparation of future EFL teachers so that the competence of university graduates will meet the requirements of school practice.

The research has been conducted in the Czech Republic and Slovakia. This study is designed to answer the following questions:

1. What is the quality of the professional preparation of future EFL teachers regarding the development of their ICT competence? (Does their ICT competence meet the requirements of school teaching practice?)

2. How to develop future EFL teachers' ICT competence if there is a need to develop it?

The aim of the dissertation is to expand the theories of pedagogy and to implement an empirical research survey which will provide valuable information for the improvement of pre-service EFL teacher training.

The major goal needs to be realized through a successful achievement of the sub-goals, which, according to the research methods used in pedagogy, can be divided into two groups:

a) theoretical goals –achieved by the description, explanation, synthesis, evaluation and comparative analysis of theoretical knowledge, aiming to create a theoretical basis for the empirical and applied outputs of the dissertation.

b) empirical goals – focus on finding the optimal form of training future EFL teachers with the emphasis on their ICT competence.

The list of sub-goals of the dissertation:

- Sub-goal No. 1: to analyze current theoretical knowledge and research findings conducted by domestic and foreign researchers who deal with the use of ICT in teaching.

- Sub-goal No. 2: On the research basis, to analyze the university course syllabi focusing on the development of future EFL teachers' ICT competence.

- Sub-goal No. 3: On the research basis to find out the opinions on the professional preparation of future EFL teachers' ICT competence from the perspectives of the selected university EFL teachers.

The concept of the whole dissertation framework including the statement of current situation on the research topic and the proposal of the research questions, took place before the outbreak of the COVID-19 pandemic. A significant part of the work including the field survey and data collection took place at the time when many people were not familiar with what distance education via online technology was. They had heard of or read about it at most. Most teachers even could not imagine how teaching could be carried out through ICT every day without personal contact with students. Furthermore, no one could imagine that online education would last such a long time due to the COVID-19 pandemic.

Subsequently, many questions have arisen, such as what effective online teaching is like; whether all students have equal access to digital technologies; whether students do not deceive in online classes; whether the excessive use of digital technologies does not harm teachers' or students' health; whether the same school schedule can be used in both in-class and online learning and whether previous form of teaching can be fully

replaced by synchronous online learning. It would be possible to mention other questions, which, however, cannot be answered in this work. Nevertheless, we will present them as highly related topics for further research. We also need to mention that at the time of writing this dissertation, the COVID-19 pandemic still continues. In the Czech Republic, we are in the period of the strictest lockdown. The night curfews are carried out and employees have to work from home. People are not allowed to leave their cities. Thousands of patients, whom doctors cannot rescue, are dying, and schools of all levels are closed - from kindergartens to universities.

1.4   Theoretical Frameworks

The dissertation is anchored in the theoretical frameworks related to the trends of education in the 21th century. On an international level, as the literature review presented below has shown, the key terms associated with these trends are: technology-based teaching, student-centered education, and the acquisition of knowledge through active learning, etc. As we perceive the integration of technology into education as an integral part in teacher training, the theoretical model TPCK (Technological Pedagogical Content Knowledge) has become the starting point, which contains the mutual interaction among the components included. Mishra and Koehler (2006) see the TPCK as a new part of a teacher's expertise which transcends all the three separate components (content knowledge, pedagogical knowledge and technological knowledge). It differs from the skills which a teacher can acquire by studying a single discipline. That is, it is not enough for teachers to study only pedagogical and general didactic disciplines, or subject-specific didactics. It is also desirable to include this new expertise in teacher education, which includes understanding the relationship and influence of the three components.

Constructivist teaching is opposite to transmissive teaching. It leads pupils to construct their individual knowledge, its understanding and useful applications. The concept of constructivism, as understood by pedagogy, refers to the formation of concepts and meanings in the mind of an individual which demonstrate a unique individual experience. In contrast, social constructivism extends individual learning to group learning and holds the view that knowledge is built more efficiently in interactions within a small group of people who share their concepts. According to many researchers (e.g. Ulit et al., 2020; Reid-Martinez & Grooms, 2021),

constructivism is the epistemological basis for understanding learning through ICT mediation.

The integration of ICT into education is closely associated with innovative processes which challenge the traditional concepts of education. The theory of the diffusion of innovations (Rogers, 1962), which is one of the oldest social theories, deals with this issue. Rogers (1962) considered the innovation, communication channels, time, and the social system to be the main elements affecting the diffusion of an innovation. Based on these elements, he defined the diffusion of an innovation as a process in which the innovation is diffused through communication channels among individuals of a social system in time and space. The successful integration of ICT into education is based on the assumption that all educators and the interests accept ICT and consider it as beneficial. Otherwise, the integration cannot be considered successful.

1.4.1 Technological Pedagogical Content Knowledge Framework

Teaching is a complex activity which requires many kinds of specialized knowledge (Marešová & Klement, 2012). Technological pedagogical content knowledge (TPCK) framework is a framework of teacher knowledge. "It builds on Shulman's (1986) construct of pedagogical content knowledge (PCK) to include technological knowledge" (Koehler & Mishra, 2009, p. 60). At the heart of the TPCK framework is the complex interplay of three forms of knowledge: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). In TPCK framework, the three primary forms of knowledge (CK, PK, TK) are not in isolation. They are interrelated with each other and form four kinds of compound knowledge: TPK (Technological Pedagogical Knowledge), PCK (Pedagogical Content Knowledge), TCK (Technological Content Knowledge), TPCK (technological pedagogical content knowledge) (Koehler & Mishra, 2009). The framework is shown below (picture 1).
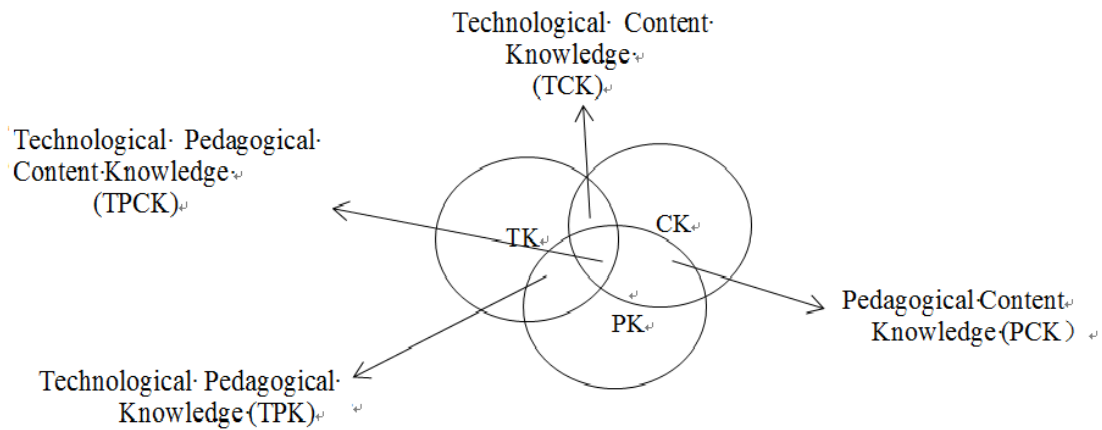
Picture 1: TPCK Framework and Elements (Koehler and Mishra, 2009).

TK (Technological Knowledge) is knowledge about using various types of technology including computer hardware and software. TK is always "in a state of flux" (Koehler & Mishra, 2009, p. 64) because new technology emerges every day. TK is more than computer literacy. "Teachers should know how to use technology effectively at work and in everyday life, understand when technology can assist or hinder realization of a goal" (Koehler & Mishra, 2009, p. 64).

CK (Content Knowledge) is the knowledge to be learnt or taught. This knowledge not only includes understanding of concepts and theories of subject-matter but also involves understanding of how theory and concept of one subject is related to other subjects (Shulman, 1986). Different academic fields or subjects have different content knowledge. For example, for the music subject, this knowledge would include music theory, music composition, musical instrument, phrase, tone; for the linguistics subject, this knowledge would include theory of language acquisition, rules of grammar, pronunciation, phonetic symbols.

PK (Pedagogical knowledge) is knowledge about scientific aspects of teaching. It is teachers' knowledge of how to teach so that students can learn. In other words, PK refers to teaching methods and teaching strategies. It involves knowledge of leaners and their characteristics, assessment, classroom management, etc. The selection of teaching methods should not only take the topics to be taught into account, but also consider characteristics of students.

TPK (Technological Pedagogical Knowledge) is "an understanding of how teaching

and learning can change when particular technology is used in a particular way" (Koehler & Mishra, 2009, p. 65). Teachers should be familiar with the affordance of technology and use it for educational purposes. Koehler & Mishra (2009, p. 66) states "TPK requires a forward-looking, creative, and open-minded seeking of technology use for advancing student learning and understanding".

PCK (Pedagogical Content Knowledge) is a combination of content knowledge and pedagogical knowledge. This concept was first put forth by Shulman(1986) who said that "pedagogical content knowledge includes the most effective analogies, illustrations, examples, explanations, word demonstrations, ways of depicting and formulating the topic which make it comprehensible to others" (Shulman, 1986, p. 9). PCK is a unique teaching experience of a teacher. It refers to teachers' using subject content knowledge and pedagogical knowledge to systematically organize courses and present them to students. The essence of PCK is to help students understand and absorb content of subjects effectively. Teachers not only need special knowledge of a certain subject, but also need knowledge of pedagogy (how to teach) (Shulman, 1986).

TCK (Technological Content Knowledge) is an understanding of how technology and content can influence each other. The content to be taught determines the types of technology to be used. Likewise, technology can promote or limit the types of content to be taught. Teachers should know how the content of subject- matter and technology can influence each other and be able to choose the suitable technology for the content they teach.

TPCK (technological pedagogical content knowledge) is a new form of knowledge that teachers must have. It involves three kinds of knowledge (subject content knowledge, pedagogical knowledge and technological knowledge), but it is not a simple combination of the three kinds of knowledge. It emphasizes integrating technology into subject content and pedagogy. When integrating technology, pedagogy and content in an appropriate way, the function of TPCK framework outweighs other elements and compound elements. Table 1 is the succinct definition of each construct and examples of TPCK dimensions (Chai et al., 2013, p. 33).

Table 1: The definition and examples of TPCK dimension (Chai et al., 2013)

TPCK Constructs	Definition	Example
TK	Knowledge about how to use ICT hardware and software and associated peripherals	knowledge about how to use Web 2.0 tools (e.g., Wiki, Blogs, Facebook)
PK	Knowledge about the student learning, instructional methods, different educational theories, and learning assessment to teach a subject matter without references towards content	knowledge about how to use problem-based (PBL) in learning
CK	Knowledge of the subject matter without consideration about teaching the subject matter	Knowledge about Science or Mathematics subjects
PCK	Knowledge of representing content knowledge and adopting pedagogical strategies to make the specific content/ topic more understandable for the learners	Knowledge of using analogies to teach electricity (see Shulman, 1986)
TPK	Knowledge of the existence and specifications of various technologies to enable teaching approaches without reference towards subject matter	The notion of Webquest, KBC, using ICT as cognitive tools, computer-supported collaborative learning
TCK	Knowledge about how to use technology to represent/ research and create the content in different ways without consideration about teaching	Knowledge about online dictionaries, SPSS, subject specific ICT tools e.g. Geometer's Sketchpad, topic specific simulation
TPACK	Knowledge of using various technologies to teach and/represent	Knowledge about how to use Wiki as a communication tool

	and /facilitate knowledge creation of specific subject content	to enhance collaborative learning in social science

1.4.2 Constructivism

Constructivism is a philosophical viewpoint about the nature of knowledge. The constructivist theory can be traced back to Jean Piaget, who focused on how humans construct meanings in relation to the interaction between their experiences and their ideas (Fosnot, 2005). Piaget (1954) believes that the development of human cognition is an interactive process between individuals and the environment, in which a meaning is constructed. Human's mental structure changes constantly. To better understand how the mental structure changes, Piaget introduced a concept called "schema". It is an important concept of constructivism. The schema refers to cognitive structure or structure of mental activity. It is the basis of cognitive activity. The formation and changes of schema determine the development of cognition. Piaget pointed out that the change of a schema is affected by three processes: assimilation, accommodation, equilibration. Assimilation means an individual absorbs stimuluses into their existing schema and makes them a part of their schema. If an individual can integrate stimuli into their own cognitive structure, the process is assimilation. Accommodation takes place when an individual cannot utilize the existing schema to accept and explain new things. Under the circumstance, they need to change the existing schema in order to adapt to the new context. Equilibration means the development of cognition is from one state of equilibration to another state of new equilibration through the individual's self-regulation.

Constructivism is a learning theory that is proposed to improve teaching. The main purpose of constructivism is to understand how the various activities in the process of development lead to independent learning of children, and how teachers play the role of supporters appropriately in the course of student learning. The essence of constructivist theory is that knowledge is not transmitted by teachers, rather, it is obtained through interaction with others in a social context through the help of others (including teachers and learning partners) in a given context, that is, social and cultural context, using the necessary learning materials, via meaning construction (Fosnot, 2005).

According to constructivism, students are not passive recipients of information, they actively make the meaning of knowledge. This process of constructing meaning can only be made individually. In the process of learning, students, based on their experience and knowledge background, select and process external information actively, whereby they make knowledge of their own. According to the constructivist theory, the external information itself is meaningless. Meaning is constructed through the reciprocal interaction between previous experiences and new experiences. In other words, the obtainment of knowledge is achieved through interaction between learners and the environment they live in. Constructivism advocates the learner-centered learning under the guidance of teachers. That is, it not only emphasizes that learners are the subjects of cognition, but also values teacher's guidance. The teacher is the facilitator of the construction of the meaning rather than inculcator or transmitter of knowledge. Constructivism holds the view that the best way for learners to achieve the construction of the meaning of what they are learning, to attain a profound understanding of the nature, the law, and the connection between the thing and the other things that the knowledge reflects, is to experience the real world of the real environment, that is, through access to direct experience, rather than just listening to others (such as teachers) on the introduction and explanation of this experience . The fundamental principle of constructivism is that learning is a constructive activity that students themselves have to carry out. Teachers' responsibilities are not to pass on knowledge to students but to create learning environments conducive to meaning construction for students (Fosnot, 2005).

"Constructivism believes that learning is an interpretive, recursive, nonlinear building process by active learners interacting with their surroundings—the physical and social world" (Fosnot, 2005, p. 291). From this point of view, learning is an active process under the guidance of the constructivist theory. Active learning is "a method of learning in which students are actively or experientially involved in the learning process" (Weltman, 2007, p. 8). Active learning is the opposite of passive learning; it is learner-centered, not teacher-led, and requires students' involvement in the learning process. According to Bloom's taxonomy, active learning benefits longer retention. There is a close relationship between recall and learners' taking an active role during or after instruction (Bloom et al., 1956). That means active learning is more likely to benefit longer and greater retention than passive learning.

Constructivist theory considers "context", "collaboration", "conversation" and "meaning construction" as four essential elements in the learning environment. The

terms "context", "collaboration", "conversation" and "meaning construction" are defined as follows (Fosnot, 2005). The "context" refers to creating a learning environment conducive to the meaning construction of the learned knowledge. "Collaboration" takes place throughout the learning process. Collaboration plays an important role in the collection and analysis of learning materials, the evaluation of learning outcomes, and the final construction of meaning. The "conversation" is an indispensable part of the collaboration process. The members of the group must discuss how to complete the learning tasks. In addition, the collaborative learning process is also a conversation process, in which each learner's idea is shared by the entire learning group. Conversation is one of the important means to achieve meaning construction. The "meaning construction" is the ultimate goal of the entire learning process. The meaning to be constructed refers to the nature, laws, and intrinsic connections between things. Helping students to construct meaning in the process of learning is to help students to get a deeper understanding of the nature and laws of things reflected in the current learning content and the internal relationship between the things and other things (Fosnot, 2005).

Although constructivism is a theory of learning, it has profoundly influenced teaching methods in education. "It suggests an approach to teaching that gives students the opportunities for concrete, contextually meaningful experience through which students can search for patterns; raise questions; and model, interpret, and defend their strategies and ideas" (Fosnot, 2005, p. ix). Under the guidance of constructivist theory, the instructor acts more like a facilitator than as a teacher. Therefore, teaching content and teaching methods should be adapted for student-centered learning environment in order to help students construct meanings. "In student-centered classrooms, the teacher becomes the 'guide on the side' instead of the 'sage on the stage', helping students to discover their own meaning instead of lecturing and controlling all the classroom activities" (Slavin, 2003, p. 243).

As mentioned previously, ICT can create interactive learning environment facilitating interaction between teachers and students, support situated learning and improve learning experience (Titova, 2012; Chen, 2013; Wang et al., 2015). For example, if a teacher lectures a lesson called Disney Land. By using virtual reality technology, students will experience the realistic scene of Disney Land. The dynamic image of Disney Land will help students remember the vocabulary related to "Good Neighbor Hotel" and "Dark Rides", etc. In this sense, the concept of using ICT in

teaching is in accordance with the concept of constructivism. In addition, with modern technology, teachers can integrate text, sound, images, pictures, videos, and animations into teaching materials, which can help students easily understand new knowledge, build a relationship between the new and old knowledge, and finally achieve meaningful construction. The fusion of text, sound, images, videos, and animations provides students with a sound learning context. The rich teaching resources enable teachers to carry out classroom activities through which the communication and collaboration between the teacher and the students and amongst students will increase.

1.4.3 Diffusion of Innovations Theory

Innovation is a very broad concept. An innovation can be an innovative spirit, a new idea, a newly emergent thing, or an invention. As we have already mentioned, diffusion of innovation theory was first proposed by an American professor E. M. Rogers (2003) in his book *diffusion of innovations*. From the perspective of communication, diffusion of innovations is a theory about how an innovation is known and diffused in a social system. "An innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12). "Diffusion is a process that communicates an innovation through specific channels among the members of a social system" (Rogers, 2003, p. 5). After a period of time of diffusion, an innovation will be accepted or refused. An innovation, even its advantages are evident, is not easy to be adopted by ordinary people. Many innovations have been diffused over several years before they are widely accepted by public. Therefore, how to accelerate the rate of diffusion of innovations is a problem many individuals and units confronted (Rogers, 2003).

Four main elements in diffusion of innovations

Rogers (2003) says the diffusion of an innovation is affected by four factors: the innovation, communication channels, time, social system.

Innovation

Rogers (2003) states that when an idea, a method, or an object is regarded as a new thing, it can be seen as an innovation. What people concern about an innovation is its newness and how it works and what it can bring to their life and make a difference.

Communication channels

Communication channels refer to the means by which information transmits from one side to another side. Mass media, including broadcast, TV, newspaper, internet, mobile phones, and so on, are regarded as the most efficient way to transmit information. Mass media can diffuse information to a vast number of people in a short time. To some extent, mass media can change people's attitudes towards a thing. Interpersonal communication is another efficient way of diffusion. Interpersonal communication, especially the communication between and among people who have similar social status, economic and educational background, is a power of persuasion. Interpersonal communication can take place between two individuals or an individual and a group of people or a group of people and another group of people. Verbal communication and nonverbal communication are two forms of interpersonal communication. Verbal communication means people exchange ideas and share information through language. Nonverbal communication means the transmission of information in the process of communication is without using language. The main form of nonverbal communication is human behavior. People can get information by observing others' behavior.

In addition, recent years have witnessed rapid development of the Internet. The Internet breaks traditional mode of communication. Internet community, such as Facebook, Twitter and the like, has become a way of information transmission. Information is usually forwarded to influence friends through the Internet community.

Time

The diffusion of an innovation cannot be achieved in a moment, rather, it is a process and it takes time. When an innovation emerges in a society, people first are aware of it and get a preliminary understanding of the innovation. Then they spend time obtaining further information of the innovation from friends or families. It takes a period of time from an individual's first understanding of an innovation to their adoption or rejection of an innovation. And during the diffusion of an innovation, the speed of adoption of an innovation is different. Some people take a long time to make decisions. Some people who like to try using new things may adopt an innovation immediately. Likewise, some innovations can be adopted by people in a short time for their obvious advantages while others are not. Therefore, time is an important factor in the diffusion of innovations.

Social system

Social system refers to a group of people that have shared problems and goals. "The members of a social system may be individuals, informal groups, organizations, and/or subsystems" (Rogers, 2003, p. 23). The diffusion of innovations happens in the social system and is affected by many factors in the system. In other words, the diffusion is affected by the following factors: "how the social structure affects diffusion, the effect of norms on diffusion, the roles of opinion leaders and change agents, types of innovation decisions, and the consequences of innovation" (Rogers, 2003, p. 24).

Five attributes of innovations

Rogers (2003) argues that whether an innovation can be successfully accepted by people is affected by the following five attributes:

(1) Relative advantages

Relative advantages refer to the relative merit an innovation has compared with the existing things. "The degree of relative advantages may be measured in economic terms, but social-prestige factors, convenience, and satisfaction are also often important components" (Rogers, 2003, p. 15). An innovation will be adopted rapidly when people believe that it has more relative advantages.

(2) Compatibility

Compatibility refers to the degree to which an innovation is compatible with potential users' needs. An innovation consistent with users' needs will be adopted more rapidly than the one that lacks compatibility.

(3) Complexity

Complexity refers to the degree of difficulty an innovation is understood. An innovation which is easily understood will be adopted more easily by people than the complicated one.

(4) Trialability

Trialability means the possibility of free use of an innovation. Free use can reduce uncertainty of users so that it can help an innovation be adopted by people.

(5) Observability

Observability means the result of an innovation can be seen by people. If the result is visible instead of abstract, it will be adopted more easily. Observability can prompt people to communicate about innovations.

Process of diffusion of innovations

During the process of diffusion of an innovation, the number of adopters changes over time. The cumulative number of the adopters over the process forms an "S" shape diffusion curve, as is shown in picture 2.
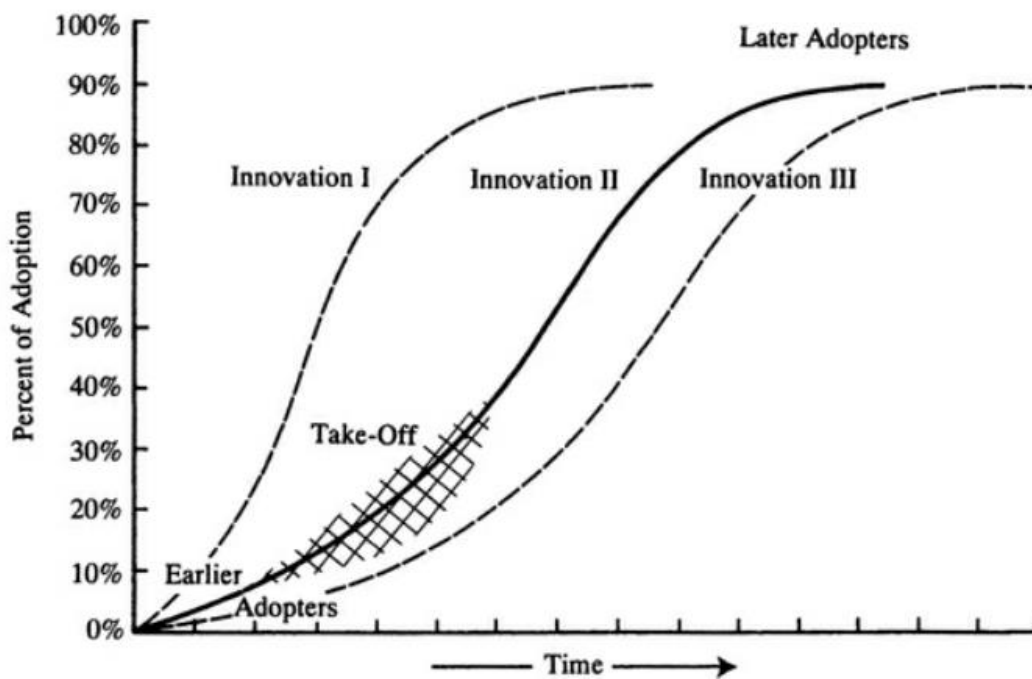
Picture 2: Rogers' process of diffusion of innovations （Rogers, 2003）

According to Rogers' process of diffusion of innovations, at the onset, adopters are few and the speed of diffusion is slow. After a period of time, the cumulative number

of adopters increases dramatically. Meanwhile, there is a rapid development of diffusion during time. After that, the cumulative number of adopters reaches a summit. In the end, no significant increase in the number of adopters is found.

The innovation-decision process

Rogers (2003) states the innovation-decision process includes the following five steps:

Awareness: people are informed of an innovation. They know about it but they do not take actions.

Persuasion: when people understand an innovation, they either have a positive attitude toward it or they have a negative attitude toward it.

Decision: people accept or refuse the innovation based on the previous attitudes.

Execution: people try to use the innovation or reject it based on the previous decision.

Confirmation: people further confirm whether the decision made is right. If the decision made is wrong, they may change the previous decision.

In recent years, more and more studies have been conducted about the diffusion of educational innovations at schools (Bandono et al., 2021; Buč & Divjak, 2015; Warford, 2017). An educational innovation can be a new tool, new technology or a new method to be adopted by educators and school authorities. The adoption of educational innovations can give rise to reforms in education system, including changes in pedagogy and teaching style. The aim of adoption of educational innovations is to make teaching more productive and support active learning. Diffusion of innovations theory can help identify the reason why in some areas, the integration of educational innovations in education are successful as well as why some educational innovations can be easily accepted in educational settings while some are not. Besides, the diffusion of innovations theory informs us that the diffusion of innovations is affected by the social system. Likewise, the diffusion of educational innovations in schools is affected by education system. Thus, efforts to improve the implementation of educational innovations in education should be devoted to concerning the whole education system instead of simply introducing educational innovations to schools (Rogers, 2003).

2 LITERATURE REVIEW

Teachers, parents and other players of school education expect the school education to be the same as it was at the time when they were young, but children do not expect it. Children want their lives to be as they are today (Hausenblas, 2005). And what is today's world like? It is filled with information and communication technologies, which over time have become an essential part of our lives. The current generation grows up with digital technology and they take it for granted. ICT is integrated into a great number of human activities, which, at first glance, are not even related to information technology. Current students, who spend much of their time with digital media, want to work with them in the educational process, too. Pupils want not only to hear, but also to see and try. Currently, it is difficult for most of them to listen to the spoken word for a long time. When visual or experimental experience is included in teaching, their attention increases (Marešová & Klement, 2012).

There is no doubt that the European Union and the governments of the individual member states consider the full implementation of modern technology in all subjects teaching as a necessity to move the education system, from emphasizing the simple memorization of facts to emphasizing the so-called literacy - especially the reading, mathematic, scientific and technical literacy. However, this requires information-literate teachers who are able to work differently than before and make full use of the potential of digital technology in teaching (Redecker, 2017; Digital Education Strategy to 2020, 2014).

2.1   ICT and Education in the 21st Century

Studies on the impact of ICT on education have increased exponentially in recent years. As far as their research is concerned, most of them have indicated that ICT can improve outcomes of education. For instance, Boulton (2017) studied whether the use of technology can help improve literacy levels of students. The subjects were 92 secondary school students with low level of literacy. Their age was from 12 to 14. 5 secondary school teachers and 7 pre-service teachers were also involved in the study. The result indicated that students were more engaged in the classroom learning than

usual. And there was an improvement in literacy level of students due to the use of technology in classroom teaching. In the study, teachers highly appraised the effectiveness of technology in improving student engagement and fostering student-centered learning.

Wainwright (2013) summarized eight studies on the impacts of iPads on education. The studies were conducted in many places including kindergarten in Auburn, University of California Irvine medical school, KIPP Academy in Houston, Houghton Mifflin Harcourt in California, etc. The participants included kindergarten children, college students, senior high school students and primary school students. The results indicated that iPads could help student achieve progress in many subject disciplines such as literacy, math, medicine, because the test scores of students who used the device were higher than those who did not use the device. In addition, the study in Open Colleges showed that most of the teachers thought that iPad can improve classroom teaching. Wang (2015) studied the effectiveness of tablet technology on art education. 12 junior high school students were involved in the study. They are taught how to use iPad applications in drawing and painting under the guidance of the teacher. The result showed that iPads could help enhance students' interest in learning art and could help develop students' innovation ability.

There is also an increasing number of studies on the effectiveness of social media on education. For instance, Rasiah (2013) studied the effectiveness of Facebook as social media on teaching and learning. The participant were 122 undergraduate students. In the study, Facebook was used as a complementary tool for classroom teaching, The findings showed that Facebook could foster communication among students and between students and the teacher. It is regarded as an ideal communication tool providing instant feedback to each other. Besides, students in the study found it easy to share ideas and documents among themselves. In a word, students enjoyed learning via Facebook. Study by Ventura and Quero (2013) indicated that using Facebook could increase interactions among students in teaching, and help students develop a set of competences including group learning skills, creativity, critical thinking, socializing skills, etc. That is, Facebook has a positive impact on learning experience.

Studies on the effectiveness of other ICT tools such as digital educational games, interactive whiteboards, MOOCs, e-books have been also conducted. Griffiths (2003) claimed that video games had educational potential. He said that video games can help develop children's thinking skills and learning skills if they were used properly.

MOOCs provides rich educational resources to teachers and students. Students in remote areas can also access the resources only if the Internet is available. Study by De Lima Guedes (2020) showed that teachers tended to integrate MOOCs into teaching practice because MOOCs can give students a platform to engage in global communities and the chance to communicate with peers, academics and professionals. This is important to student learning according to constructivism which highlights the role of participation in learning. Korat et al. (2014) studied the effect of an e-book on preschoolers' vocabulary learning. 144 preschool children were involved in the study. The results showed that an e-book with a dynamic dictionary could benefit students more in vocabulary acquisition than an e-book with a static dictionary or without a dictionary. Luo and Yang (2016) studied the effect of interactive whiteboards on student learning in Taiwan. The participants were 544 primary school students. The results indicated that the use of interactive whiteboard in teaching could positively affect student learning. Teachers' use of interactive whiteboards could enhance students' enjoyment of learning as well as student engagement in learning.

Table 2: Advantages of ICT tools for education in general
(based on reviewed literature)

Advantages of ICT tools for education in general
Creating more interactive learning environments
Enhancing critical thinking skills
Facilitating individual learning
Enabling ubiquitous learning
Providing immediate feedback
Motivating interest of learning
Supporting situated learning
Minimizing educational disruption in conflict and disaster areas
Ensuring productive use of time spent in classrooms
Expanding equal access to learning

Bridging formal and informal learning,
Enhancing seamless learning
Building new communities of learners
Improving communication and administration
Assisting learners with disabilities

However, there also exist negative views of using ICT in education. Sana et al. (2013) studied whether multitasking on a laptop during a lecture can affect learning performance. The result indicated that student who multitasked on their laptops during the lecture got lower scores than those who used their laptops exclusively for taking notes. In addition, to integrate ICT in teaching, "teachers need to be familiar with a number of resources and sometimes they lack enough preparation. Sometimes the application of some activities requiring ICT may be time-consuming and some students might be reluctant to use new technologies" (Cuestas & Fazzi, 2012, p. 9).

Table 3: Disadvantages of using ICT in education (based on reviewed literature)

The disadvantages of using ICT in education
Causing distraction
Less time on coursework
Lack of enough preparation of ICT knowledge
Time-consuming
Students' reluctance to new technology

In an overview, the advantages of using ICT in education outweigh the disadvantages. ICT tools have become a means to realize the digitalization of education. They can help teachers create dynamic courseware with graphics, hyperlinks, audio texts, etc., realize active classroom and improve outcomes of learning. ICT can also foster communication between teachers and students and enable learning in an authentic

environment. In addition, technology has potential to promote student engagement and can make students excited to participate in teaching and learning practice (Billings & Mathison, 2011). If teachers are able to incorporate interesting materials to make lessons fun for students, the engagement will be increased (Gilakjani, 2017).

2.2   ICT Integration Models in Education

"ICT includes computers, mobile phones, digital cameras, satellite navigations systems, electronic instruments and data recorders, radio, television, computer networks, satellite systems ... almost anything which handles and communicates information electronically. In other words, it includes both the hardware (the equipment) and the software (the computer programs in the equipment)" (UNESCO, 2011, p. 92).

The introduction of ICT in educational institutions has been fostered in many countries (Gobbo & Girardi, 2001). However, the achievement is not satisfying. Studies showed that teachers knew how to use basic ICT tools, but they did not know how to use these tools to improve teaching and student learning. That means they had knowledge of using technology, but they did not have knowledge of integrating technology in teaching (Aslan & Zhu, 2018). Effective integration of ICT into teaching and learning has become an essential competence for teachers (Wang, 2008). In education, simply providing students with a variety of digital resources such as websites or digital tools is definitely not ICT integration (Wang & Woo, 2007). "Integration does not just mean placement of hardware in classrooms" (Earle, 2002, p. 7). "ICT integration heavily emphasizes that ICT and other crucial educational components such as content and pedagogy are molded into one entity" (Wang & Woo, 2007, p. 149). Knowledge about integrating technology into instruction and knowledge about using technology such as a particular piece of software, e.g. a browser, a spreadsheet, a video capture or an editing program are two different things (Lawless & Pellegrino, 2007). A study revealed that teachers expressed that they were good at using technology, but they were not good at using ICT in teaching (Røkenes & Krumsvik, 2016). "Successful technology integration requires concerted focus on the improvement of student learning" (Earle, 2002, p. 7).

The integration of ICT in education differs from the use of ICT in education (Rao, 2013). The differences are showed in Table 4 as follows:

Table 4: The differences between using technology and technology integration
(Rao, 2013)

Using Technology	Technology Integration
Technology usage is random, arbitrary and often an afterthought.	Technology usage is planned and purposeful.
Technology is rare or sporadically used in the classroom.	Technology is a routine part of the classroom environment.
Technology is used purely for the sake of using technology.	Technology is used to support curricular goals and learning objectives.
Technology is used to instruct students on content.	Technology is used to engage students with content.
Technology is mostly being used by the instructor(s).	Technology is mostly being used by the student(s).
Focus on simply using technologies.	Focus on using technologies to create and develop new thinking process.
More instructional time is spent on learning how to use the technology.	More instructional time is spent on using the technology to learn.
Technology is used to complete lower-order thinking tasks.	Technology is used to encourage higher-order thinking skills.
Technology is used solely by individuals working alone.	Technology is used to facilitate collaboration in and out of the classroom.
Technology is used to facilitate activities that are feasible or easier without technology.	Technology is used to facilitate activities that would otherwise be difficult or impossible.
Technology is used to deliver information.	Technology is used to construct and build knowledge.
Technology is peripheral to the learning activity.	Technology is essential to the learning activity.

ICT integration is a growing area that has attracted the attention of many researchers in recent years. When teachers can effectively integrate ICT into education, ICT has the potential to enhance teaching and learning (Wang & Woo, 2007). Many researchers have dealt with how to integrate ICT in education effectively. In the following subchapters, some ICT integration models in education are elaborated. Furthermore, the stages and basic principles are explained.

2.2.1 The Five-stage Technology Integration Model

Toledo (2015), studying the stages that schools, colleges, and departments of education (SCDEs) experienced as faculty and students moved from lower to higher levels of computer technology use and integration, developed a five-stage model for computer technology integration for teacher education. The five-stage technology integration model is shown in table 5.

Table 5: The Five-stage technology integration model by Toledo (2015)

Stage	Characteristics, Tasks, Actions
Pre-Integration	• lack of university leadership • few faculty using computer technology • stand-alone classes offered to meet credentialing requirements • lack of infrastructure to provide funding, support, and resources
Transition	• change in support of leadership at the university, school, and/or departmental levels • increased interest and vision for the use and integration of computer technology filters down to the teacher educators • requirements of technology standards produce shift
Development	• SCDEs begin to complete tasks that enable them to infuse computer technology throughout the curriculum o acquisition of technical resources such as computers for

	faculty, computer labs o hiring of education technology faculty and specialists o planning and implementation of new faculty development programs

Expansion	• further movement in the department toward providing the needed education technology hardware, software and systematic training for faculty success in computer technology integration
	
	    o strengthening of the relationships between the support personnel and the faculty
	
	    o presence of these relationships produces positive impact on the faculty levels of use and integration
	
	    o creation of an environment in which faculty are encouraged to risk trying new technologies and methodologies

Systemwide Integration	• evidence of the integration of standards proficiencies for students indicated • computer technology being imbedded into each of the teacher education courses • faculty and student's enthusiasm for integration increases

    In the model, each stage is with different features, actions and tasks as the stage moves towards the highest level of technology integration. The first stage is pre-integration. Technology is rarely used in this stage and there is no infrastructure to support the integration. The second stage, transition, is characterized by increased use and integration of technology. In the third stage, development, SCDEs take initiatives to realize the integration of technology in teaching. In the fourth stage, expansion, further support is given to the provision of technology as well as faculty training. In the last stage, systemwide integration, technology is widely used in every curriculum. This model can be taken as a guide for SCDEs to improve the integration of technology in schools (Toledo, 2015).

2.2.2 The SAMR Model

Dr. Ruben Puentedura (2006) created the SAMR (Substitution, Augmentation, Modification and Redefinition) model, shown in picture 3, to help teachers understand the stages of ICT integration they will take, reflect and assess their ICT integration practice. The model presents four stages of ICT integration in K-12 educational settings (Wahyuni et al., 2019).

The first stage is substitution. At this stage, technology without changing its function direct substitutes other tools. This is the lowest stage of technology integration. For example, teachers look for learning resources such as links or You Tube video for students.

Augmentation is the second stage. At this stage, technology is used as a tool to improve teaching and learning. With the technology, there is a better learning experience and increasing engagement among students.
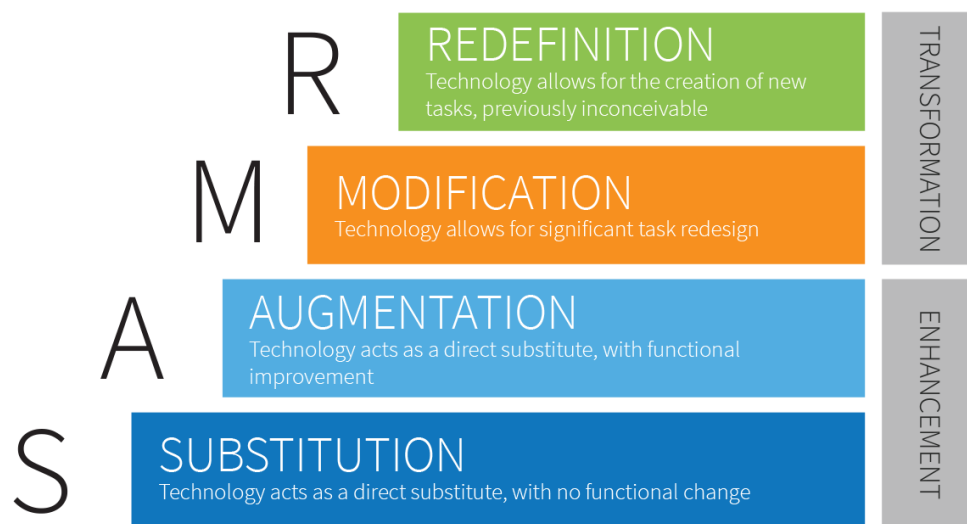
Picture 3: The SAMR model by Dr. Ruben Puentedura (2014)

Modification constitutes the third stage in the model. At the stage, technology can enhance the effect of students' performance. For instance, students add some dynamic pictures or video into their works or presentation to attract attention from audience. The highest stage is redefinition. At this stage, technology is used to create works and tasks. Students become producers, creators, and innovators. For example, a tale can be remade into a picture, a book, or a movie. Students create their own content for others (Puentedura, 2006).

2.2.3 The Technology Integration Planning Model

Roblyer (2006) developed a technology integration planning model (TIP), which gives a general approach to addressing challenges involved in integrating technology into teaching practice. The TIP includes five phrases: determine relative advantage; decide objectives and assessment; design integration strategies; prepare the instructional environment; evaluate and revise integration strategies. The model is shown as follows (picture 4):
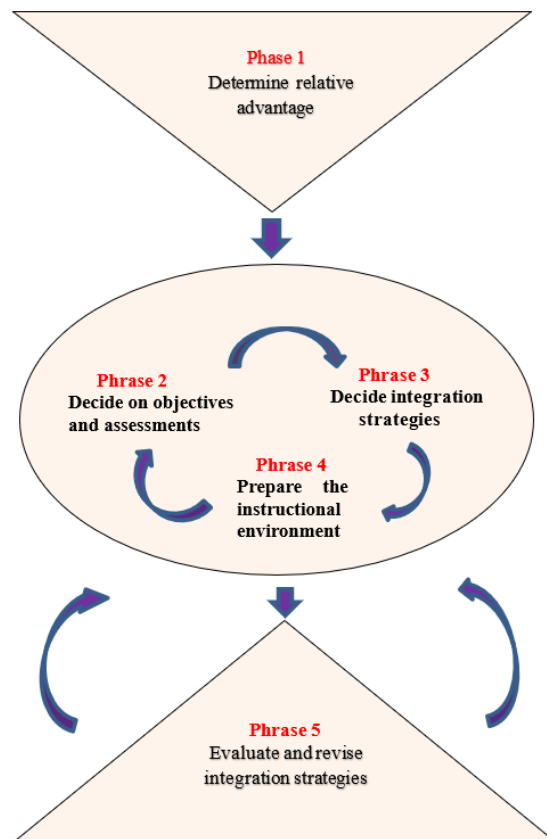
Picture 4: The TIP model (Roblyer, 2006)

Phrase 1: Determine relative advantage

At this stage, it should be considered why a technology-based method should be used, what is the problem addressed and whether technology-based methods offer a solution with sufficient relative advantage.

Phrase 2: Decide objectives and assessment

At this stage, teachers should consider how to know whether students have learnt, what outcomes are expected and how to assess these outcomes.

Phrase 3: Design integration strategies

At this stage, it should be considered what teaching strategies and activities will work best, what kinds of instructional methods are needed, how technology best supports these methods, how to prepare students adequately to use technology.

Phrase 4: Prepare the instructional environment

At this stage, teachers should create a good teaching environment in which effective technology integration is achieved. The equipment, software, media, materials that are needed, the arrangement of resources to support instruction and learning and the planning required to make sure technology resources work well should be considered.

Phrase 5: Evaluate and revise integration strategies

This stage is a process of self-reflection. At this stage, teachers should self-reflect their technology integration in teaching practice. They should consider what can be done to improve technology integration.

2.2.4 The Systematic ICT Integration Model

Wang and Woo (2007) developed a systematic ICT integration model, as shown in picture 5. This model requires teachers to explicitly explain the reason for using the technology, and how to effectively integrate the technology. The components of the model consist of seven parts: problem statement; learning objectives; technology required; rationale; strategies; assessment; reflection.
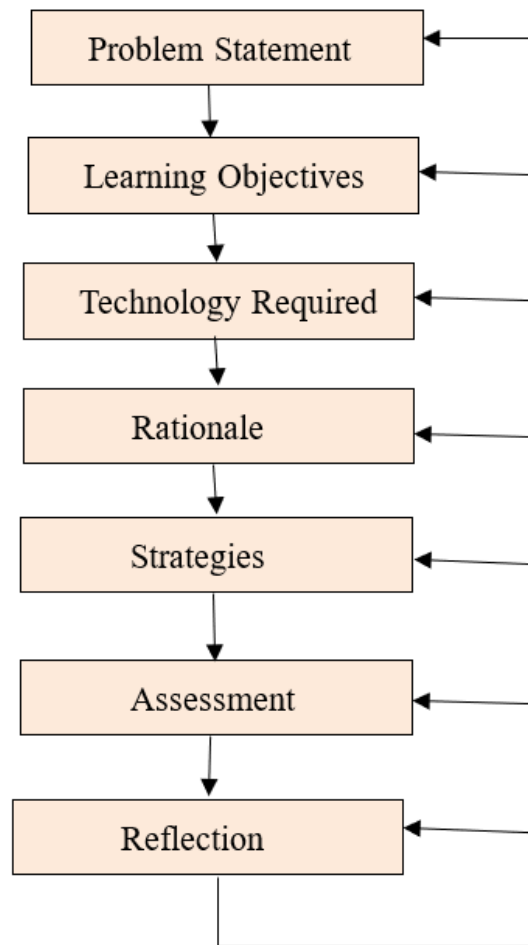
Picture 5: The systematic model for ICT integration (Wang & Woo, 2007)

Problem statement

This stage is the starting point of ICT integration. Problem statement refers to the problems to be solved in a topic. The problem should be relevant to target learners rather than the teachers.

Learning objectives

Learning objectives refers to the expected learning outcomes students will get after learning the topic. Learning objectives should be specific and measurable.

Technology required

Teachers should consider the suitable technology that can be used in teaching to achieve

the learning objectives and address the problem mentioned above. It may include software, hardware and any other tools.

Rationale

Rationale refers to the reason for using the selected technology. Teachers should select the suitable technology for the topic learned based on whether the use of the selected technology can enhance learning or can bring effective teaching and learning.

Strategies for implementation

At this stage, teachers should consider how to effectively integrate ICT in the learning process. Teachers also need to consider whether the ICT -integration plan can promote student learning, including critical thinking and higher-order thinking.

Student assessment

The assessment in question is used to understand how well students master the learnt knowledge. The assessment can be ICT-based or non-ICT-based. The ICT-based assessment refers to using computer technology to submit tasks or assignments. The non-ICT-based assessment refers to the traditional way of submitting an assignment characterized by writing assignments on paper.

Reflection

After completing the ICT-integrated topics, teachers should reflect their experiences of integrating ICT in teaching, such as whether the selected technology is appropriate, the advantages and disadvantages of using the technology, and the possible ways of improvement.

2.2.5 The Generic ICT Integration Model

Wang (2008) proposed a generic model shown in picture 6 for guiding the integration of ICT in teaching and learning. The model consists of three fundamental elements: pedagogy, social interaction and technology (Wang, 2008).
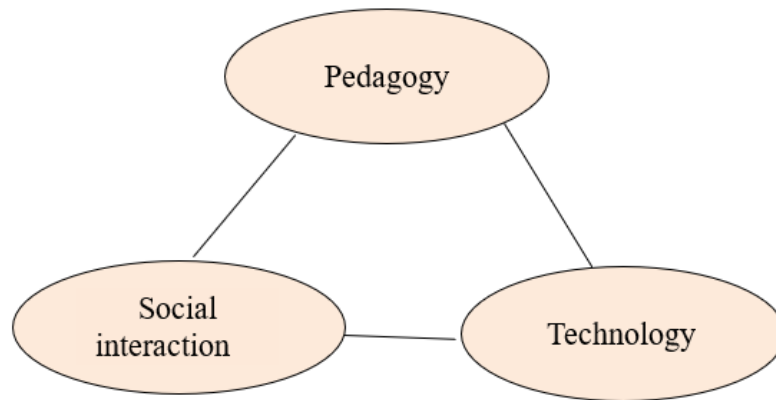
Picture 6: The generic model (Wang, 2008)

Pedagogy refers to the strategies and techniques that the teachers use to scaffold learning. Pedagogical design must consider how to use available resources in an effective way in order to facilitate student learning. Social interaction is important to learning. With technology, teachers should create a desired learning environment for students, in which they can communicate and share information with others by means of ICT. Technology is an essential condition for ICT integration because many educational activities cannot be conducted without the support of a computer. Excellent design of pedagogy or social interaction heavily depends on the support of technology. According to the generic model, successful ICT integration should take pedagogy, social interaction and technology together and blend them in a balanced way (Wang, 2008).

2.2.6 The Technology Integration Matrix (TIM) Model

The Florida Center for Instructional Technology (FCIT) (2007) developed the technology integration matrix (TIM) model to illustrate the integration of technology in educational settings. The TIM model incorporates five interdependent characteristics of meaningful learning environments: active; collaborative; constructive; authentic; and goal-directed and five levels of technology integration: entry; adoption; adaptation; infusion; and transformation. The five characteristics of meaningful learning environments and the five levels of technology integration together create a matrix of 25 cells. The model is shown in table 6.

Table 6: The Technology Integration Matrix (TIM) model, developed by FCIT (2007)

Levels of Technology Integration into the Curriculum

Characteristics of the Learning Environment	Entry	Adoption	Adaptation	Infusion	Transformation
Active	Information passively received	Conventional, procedural use of tools	Conventional independent use of tools; some student choice and exploration	Choice of tools and regular, self-directed use	Extensive and unconventional use of tools
Collaborative	Individual student use of tools	Collaborative use of tools in conventional ways	Collaborative use of tools; some student choice and exploration	Choice of tools and regular use for collaboration	Collaboration with peers and outside resources in ways not possible without technology
Constructive	Information delivered to students	Guided, conventional use for building knowledge	Independent use for building knowledge; some student choice and exploration	Choice and regular use for building knowledge	Extensive and unconventional use of technology tools to build knowledge
Authentic	Use unrelated to the world outside of the instructional setting	Guided use in activities with some meaningful context	Independent use in activities connected to students' lives; some student choice and exploration	Choice of tools and regular use in meaningful activities	Innovative use for higher order learning activities in a local or global context
Goal-Directed	Directions given, step-by-step task monitoring	Conventional and procedural use of tools to plan or monitor	Purposeful use of tools to plan and monitor; some student choice and exploration	Flexible and seamless use of tools to plan and monitor	Extensive and higher order use of tools to plan and monitor

The TIM model indicates how two elements work with each other to measure the effectiveness of ICT integration in teaching. For example, we can look at the table and find what it looks like if the students are in a constructive learning environment with entry level of technology integration. It reads "information delivered to students". If students are in a constructive learning environment with transformational technology integration, it looks like "extensive and unconventional use of technology tools to build knowledge".

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2.2.7 The System-based Mentoring Model

Kopcha (2010) developed a system-based mentoring model of ICT integration to delineate how a mentor can support and help teachers to develop skills of ICT integration in teaching. The model is shown in picture 7. Initially, the mentor analyzes the need of teachers. Based on the need, the mentor considers strategies to meet the need. Then comes the four stages of ICT integration including initial setup, teacher preparation, curricular focus, and community of practice. After each of the four stages of ICT integration, the mentor evaluates the outcomes and revises the goal if there is a need. After that, the system begins again. The system in the model is recursive. What the mentor does in each of the four stages to help teachers' learning of ICT integration is presented below.
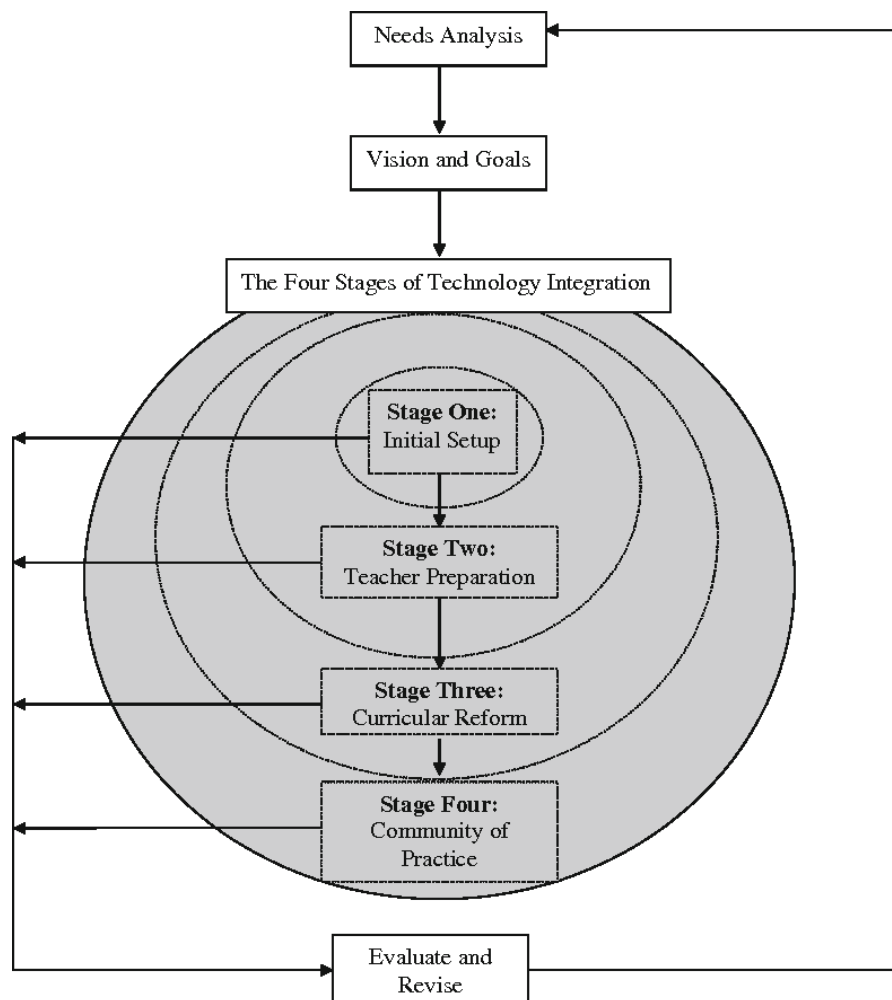
Picture 7： The System-based mentoring model of ICT integration (Kopcha, 2010)

1. Initial setup: the mentor helps teachers access technology and create a friendly environment to support the use of technology.

2. Teacher preparation: the mentor prepares teachers to use technology in student-centered ways and focuses on teachers who have little knowledge of basic skills with technology.

3. Curricular focus: the main task of the mentor at this stage is to increase teachers' experiences with the pedagogy needed to employ technology in student-centered ways.

4. Community of practice: During this stage, the mentor trains teachers and faculty working in schools to become technology leaders and help create a community of practice for collaboration among teachers.

2.2.8 The SQD (Synthesize Qualitative Data) Model

Tondeur et al. (2012) developed an ICT integration model for pre-service teachers by reviewing qualitative studies related to preparing pre-service teachers to integrate technology into their lessons. The aim of the model is to showcase the strategies for technology integration in pre-service teacher education program. Picture 8 shows the model.

The model includes 12 key themes, which are divided into two categories: "key themes related to the preparation of pre-service teachers at the micro level and key themes about conditions necessary to implement such programs at the institutional level" (Tondeur et al., 2012, p. 8). Tondeur et al. (2012, p. 8) said that "the two key themes 'aligning theory and practice' and 'systematic and systemic change efforts' are overarching themes, identified as important at both micro and institutional levels".
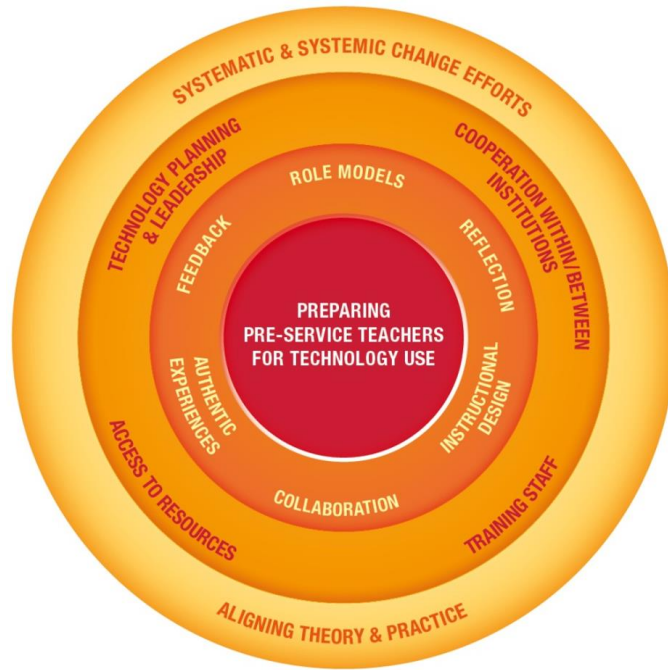
Picture 8: The SQD model (Tondeur et al., 2012)

Tondeur et al. (2012, p. 5-6) conclude that key themes related to the preparation of pre-service teachers include:

"• aligning theory and practice

• using teacher educators as role models

• reflecting on attitudes about the role of technology in education

• learning technology by design

• collaborating with peers

• scaffolding authentic technology experiences

• moving from traditional assessment to continuous feedback"

The authors also conclude that key themes related to the institutional level include:

"• technology planning and leadership

• co-operation within and between institutions

• staff development

• access to resources

• systematic and systemic change efforts" (p. 7)

2.3 Factors Influencing ICT Integration in Education

From the analysis in chapter 2.1, we are informed that the advantages of the integration of ICT in education outweigh the disadvantages. There is consensus that successful integration of ICT can benefit the outcomes of teaching and learning. Therefore, it is necessary to understand what factors influence the successful integration of ICT, so that barriers can be avoided and situation can be improved to achieve successful integration of ICT in teaching. Previous studies showed that the following factors can influence the integration of ICT in education.

2.3.1 Perceived Value and Expectancy of Success

Wigfield and Eccles (2000) proposed an expectancy-value theory which is to explain how motivation influences performance. "Expectancy-value theory believes that individuals' choice, persistence, and performance can be explained by their beliefs about how well they will do on the activity and the extent to which they value the activity" (Wigfield & Eccles, 2000, p. 68). People with high perceived value and expectancy of success of doing something are more willing to do it. Khawaji (2016) studied whether teachers' perception of technology use in classroom teaching had an impact on teachers' integration of technology in teaching. He found out that teachers' perceived value and their expectancy of success can significantly influence teachers' use of technology in teaching practice. Teachers who believe that ICT can promote teaching and learning tend to have more frequency of ICT integration in classroom. However, Buabeng-Andoh (2019) discovered that teachers' perceived value and expectancies of success did not have significant correlation with the integration of technology. In other words, teachers believed that ICT can benefit teaching and learning, but they rarely used ICT in teaching. This may be due to other factors, such as perceived ICT competence, school support, access to technology, etc.

2.3.2 ICT Competence

ICT competence is defined as knowledge and skills of using ICT as well as attitudes towards using ICT (Ananiadou & Claro, 2009). Many studies indicate that teachers' ICT competence influences their integration of ICT in education. Aslan & Zhu (2018) argue that perceived ICT competence had a positive impact on teachers' integration of ICT into their lessons. Sipila (2014) studied teachers' digital competence and their use of ICT in teaching in the context of Finland. 292 Finnish teachers from primary, secondary, and upper secondary schools were involved in the study. He found that teachers who had advanced ICT competence used ICT frequently in education. Gobbo and Girardi (2001) conducted a study on ICT integration in classroom teaching in the context of Italy. The result indicated that teachers who had high level of competence with ICT made greater use of ICT in their teaching than teachers who had lower competence with ICT did. It is worth noting that ICT competence is not equal to ICT literacy or ICT skills (Punie & Cabrera, 2006). According to the definitions identified by European Commission, "ICT competence not only includes ICT literacy which means learning to operate technology, but also includes high-order skills" (Punie & Cabrera, 2006, p. 10).

2.3.3 Computer Self-efficacy

Computer self-efficacy refers to teachers' evaluation of their ability to use computer technology to complete a certain task. In other words, it refers to teachers' confidence in their use of computer technology (Wong et al., 2012). In the study of teachers' use of ICT in classroom teaching, Hassan et al. (2016) studied factors influencing teachers' ICT competence in the context of Iran. The participants were teachers from secondary schools. Interviews were adopted to collect data. He found that teachers' self-confidence can influence their use of ICT in teaching. This is coherent with Chen (2010) who found that computer self-efficacy has an impact on teachers' integration of technology.

2.3.4 Training

Training of pedagogical use of technology for teachers plays an important role in the successful integration of computers into classroom teaching. There is a growing corpus of studies which suggest that there exists a relationship between training and the integration of ICT in education. Hassan et al. (2016) studied factors that affect teachers' motivation to use ICT in the classroom. The research revealed that effective training was one of the important factors which influenced the integration of ICT in the classroom. The study by Mulhim (2013) on the use of ICT in classroom teaching by female primary school teachers in the context of the Kingdom of Saudi Arabia indicated that technology was rarely used in the teaching process. Teachers had no training experiences regarding the use of ICT in teaching. It is noteworthy that a lot of research has shown that although ICT training programs have been offered, the result is not satisfactory. There are two main reasons. "Firstly, the training has been delivered as 'one-size fits all' and has not been related to the trainees' specific needs. The other factor is that most of the training courses are solely concerned with technological skills" (Mulhim, 2013, p. 597). "It is not ICT use per se that improves education but other factors such as what kind of use, what it is used for, and how it is utilized" (Gobbo & Girardi, 2001, p. 64).

2.3.5 Computer Accessibility

The availability of ICT infrastructure and resources is an important factor influencing the adoption of ICT in teaching. Successful integration of technology in education depends on the accessibility of digital technology and services (Buabeng-Andoh, 2019). Access to ICT resources does not only mean the availability of technology resources, but also the suitable type of ICT tools teachers and students can use for teaching and learning (Buabeng-Andoh, 2019). In the study by Hassan et al. (2016), all the participants pointed out that if technologies were available in schools, teachers would more likely to use them in teaching. Tondeur et al. (2008) found that the availability of technology can positively influence technology integration. They found that if students could access computer technology in classrooms, they were more likely to use it as a learning tool.

2.3.6 Leadership Support

School leadership support is an important factor affecting the use of technology by teachers (Hassan et al., 2016,). A study by Becker & Riel (2000) found out that if schools can create more opportunities, such as seminars, for teachers to communicate with each other at schools or outside schools, their use of technology in teaching will increase. It is suggested in the study that schools should organize more professional activities in the form of seminars, workshops, and conferences to encourage professional interaction. Buabeng-Andoh (2019) found leadership support had a positive impact on teachers' technology integration in teaching. That is, teachers are more willing to integrate technology in their teaching practices when they think their schools can support them to implement technology. The study suggested that school leadership support should play its role in the successful integration of ICT in teaching. Uluyol and Sahin (2016) studied the use of technology by elementary school teachers and the incentives inciting them to use technologies in classroom teaching in the context of Turkey. 101 elementary school teachers from 24 public elementary schools participated in the study. The study highlighted school leadership support as an incentive for encouraging teachers' use of technology in teaching. The study suggested a special training for the school leaders in order to improve ICT integration in teaching.

2.3.7 Gender

There exists a debate about gender difference in influencing teachers' ICT integration in education. Some research findings show that male teachers have higher competence than female teachers in ICT integration in teaching. For example, Vitanova et al. (2015) studied factors affecting the development of ICT competence of teachers in primary schools. 220 teachers from 10 primary schools of Macedonia were involved in the study. The findings indicated that men were more likely to have higher ICT competence than women. However, research by Aslan and Zhu (2017) showed that gender variable did not significantly influence pre-service teacher' use of ICT in teaching practice.

2.3.8 Age

Samak (2006) studied EFL teachers' ICT integration in Jordan. The result indicated that the age had a negative impact on the Jordanian EFL teachers' attitudes towards ICT. In other words, when the age of the teachers increased, their positive attitudes towards ICT decreased. The study showed that younger Jordanian EFL teachers used technology more frequently than older teachers. To compare, a study by Inan and Lowther (2010) revealed that there was no significant direct relation between teachers' age and teachers' readiness to use ICT. However, the study showed that teachers' age and their computer proficiency were negatively correlated. That means the age had an indirect negative impact on teachers' technology integration. Makhlouf and Bensafi (2021) studied factors influencing teachers' use of ICT in teaching. The participants were 50 secondary school EFL teachers. The result indicated that age did not significantly influence teachers' use of ICT in teaching practice.

2.3.9 Working Experience

Teaching experience is a variable of the years of teaching service. Generally, age is related to teaching experience. That is, elder teachers have more teaching experience than young teachers. A study by Samak (2006) indicated that there was a negative relationship between teachers' teaching experience and their attitude towards ICT. Inan and Lowther (2010) studied factors influencing teachers' integration of technology in K-12 classrooms. The results indicated that there was a negative relationship between years of teaching and technology integration. Teachers with less teaching experience used technology more frequently than experienced teachers.

2.3.10 Subject/Elementary Teacher

Aslan and Zhu (2017) studied Turkish pre-service teachers' integration of ICT. The participant were 599 pre-service teachers. They were in the fourth year of their training programs. The subject areas included science, mathematics, social sciences, Turkish language. The study showed that subject variable could significantly affect pre-service teachers' integration of ICT in teaching practice. In other words, the extent to

the integration of ICT into teaching was different in different subjects of the teaching programs. The pre-service science teachers were more likely to integrate ICT in teaching than the pre-service elementary mathematics, social sciences and Turkish language teachers. A study by Barton and Haydn (2006) showed that teachers of different subjects had different preference in using different ICT tools. In other words, there were different levels of technology use among teachers of different subjects. However, a study by Aslan and Zhu (2018) on in-service teachers' ICT integration indicated that the subject variable did not significantly influence teachers' integration of ICT in teaching.

2.3.11 The Location of Schools

Different geographical areas have various levels of general welfare and income of local people, which affect the amount of support from local people that can be given to the local school (Albirini, 2006). A study by Buabeng-Andoh (2019) indicated that the semi-urban school teachers used technology less frequently in teaching than the urban school teachers in that the semi-urban school teachers got fewer training and school leadership support than the urban school teachers. However, a study by Vitanova et al. (2015) revealed that the location of schools was not a significant factor influencing ICT integration.

2.3.12 Teachers' Personal Theories of Teaching

Teachers' personal theories of teaching affect what teaching method a teacher adopts in teaching practice. Teachers' personal theories of teaching determine what to teach and how to teach it in the classroom. If a teacher prefers student-centered learning, ICT will be more easily integrated into classroom use. On the other hand, if the classroom teaching is still teacher-centered, traditional teaching methods will be dominant. Honey and Moller (1990) interviewed twenty teachers from elementary, middle, and high schools in Italy. They found that teachers' educational beliefs had a major impact on the integration of ICT in teaching. The study indicated that teachers whose beliefs were student-centered tended to use computer-based technology in their

teaching practice; teachers whose beliefs were teacher-centered were less likely to use computer technology in classroom. Gobbo and Girardi (2001) found that transmission-oriented teachers rarely used computer technology in classroom and constructivist teachers were motivated to use ICT in teaching.

2.3.13 Lack of Time

Lack of time has been identified in literature as a factor influencing the successful integration of ICT in teaching. Abuhmaid (2011) made a study on the impact of ICT training courses on the development of teachers' ICT competence in the context of Jordan. Both qualitative and quantitative research methods were used to collect data. The participants were 115 teachers and 12 principals. In the study, one teacher wrote: "it is unrealistic for the teacher to search for other materials than the textbook if his/her workload is more than nine lessons a week" (Abuhmaid, 2011, p. 201). Another teacher noted: "using the computer needs time for preparing the digitized materials, and we, the teachers, suffer from the lack of time and work pressure" (Abuhmaid, 2011, p. 201). The study showed that timing issue was also a problem for teachers' taking of ICT training courses, especially for female teachers, because ICT training courses often took place after school hours or during holiday and female teachers found it difficult to attend the training courses because they had family commitments. In the study, one teacher commented: "the place where training takes place and its distance from where one lives should be considered. Training should also be considered as part of the teacher's working hours" (Abuhmaid, 2011, p. 201). Barton and Haydn (2006) studied factors influencing teachers' use of ICT in their subject teaching. The findings indicated that time issue was an important factor affecting the integration of ICT in teaching practice and teachers even had no time to learn new technology for the improvement of their ICT competence.

2.4 EFL teachers' ICT Competence

With the penetration of digital technology into various areas and human activities, the demands on related knowledge, skills and attitudes are growing. At the same time, there is a problem when schools help develop teachers' digital competence and later

find that they are not able to effectively integrate technology in teaching. Therefore, various models of ICT integration into school education are being developed around the world. Initially, it was a rather accidental use of ICT by teachers, later students began to work with these technologies. Specifically, a subject was created in school curricula where students became acquainted with computer hardware and learned to use common software applications. In other subjects, pupils and students did not have opportunities to use technology. From today's point of view, however, this does not seem to be enough. It is necessary to integrate ICT into individual subjects so that it becomes a natural part of students' learning environment and activities. That is why education is changing all over the world, and we see the use of digital technology in most subjects, specifically in EFL. However, there is a need for teachers to have the appropriate competence. On the one hand, they must be able to master and use technology themselves; and on the other hand, they must be able to create a learning environment where technology is exposed to pupils and they can use the technology naturally.

2.4.1   ICT Competence

"The concept of competence was originally developed in psychology referring to the individual's ability to respond to certain demands placed on them by their environment" (Sampson & Fytros, 2008, p. 160). Below, some main definitions of competence are presented in order to get full understanding of the term.

Mandl and Krause (2003, p. 76) said that competence can be seen "as a system of prerequisites for successful action in certain domains that can be influenced by practice and learning". Weinert (1999) defined a more general concept of competence. According to Weinert, competence is "a roughly specialized system of abilities, proficiencies, or individual dispositions to learn something successfully, to do something successfully, or to reach a specific goal" (Weinert, 1999, p. 34). Sampson and Fytros (2008, p. 165) defined "competence as a set of personal characteristics (e.g. skills, knowledge, attitudes) that an individual possesses or needs to acquire, in order to perform an activity within a specific context".

Rychen and Salganik (2003, p. 4) stated that "competence is more than just knowledge or skills. It involves the ability to meet complex demands, by drawing on

and mobilizing psychosocial resources (including skills and attitudes) in a particular context. For example, the ability to communicate effectively is a competence that may draw on an individual's knowledge of a language, practical IT skills, and attitudes towards those with whom he or she is communicating". This definition of competence is in line with the European understanding of competence. According to the European understanding of competence — European e-competence framework (e-CF, 2014, p. 5), competence is defined as "a demonstrated ability to apply knowledge, skills, and attitudes for achieving observable results". In the European e-competence framework, the terms "skill", "attitude", "knowledge" are defined as follows. "The term skill is defined as the ability to carry out managerial or technical tasks. Attitude means in this context the cognitive and relational capacity (e.g. analysis capacity, synthesis capacity, flexibility, pragmatism…). If skills are the components, attitudes are the glue, which keeps them together. Knowledge represents the set of know-what (e.g. programming languages, design tools…) and can be described by operational descriptions" (Methodology of e-CF, n.d.).

In line with European understanding of competence, the OECD (Organization for Economic Cooperation Development) (2005) also viewed attitudes as a component of competence. "Competence is more than just knowledge and skills" (OECD, 2005, p. 4). Rychen (2016) in his contribution to *OECD Education 2030: Key Competencies for the Future* pointed out that competence is defined as "the ability to successfully meet complex demands in a particular context through the mobilization of knowledge, (cognitive, metacognitive, socio-emotional and practical) skills, attitudes and values" (p. 3). According to the definition, attitudes and values are regarded as essential components of competence and cannot be ignored. Knowledge, skills, attitudes and values affect each other and then influence one's actions and performance (Rychen, 2016). According to OECD (2019a), knowledge includes both theoretical understanding and practical experience of doing something. There are four different types of knowledge: "disciplinary knowledge, interdisciplinary knowledge, epistemic knowledge and procedural knowledge" (OECD, 2019a, p. 16). OECD (2019a) defined the above mentioned four types of knowledge as follows. Disciplinary knowledge involves content and theoretical ideas about a certain subject. For instance, the knowledge of physics and chemistry. Interdisciplinary knowledge refers to the understanding that the theory and content of one subject is related to other subjects. Epistemic knowledge refers to knowing how experts of subject disciplines think and

handle things. Procedural knowledge is knowledge of the order of doing things. Skills refer to the ability of using knowledge and experience to perform a task. There are three different types of skills: "cognitive and metacognitive skills, social and emotional skills, practical and physical skills" (OECD, 2019a, p. 16). OCED (2019a) defined the mentioned three different types of skills as follows. Cognitive and metacognitive skills refer to the ability to self-monitor, self-control and self-regulate. Social and emotional skills include mutual respect, trust, empathy, sharing, optimism. Practical and physical skills refer to the ability to use physical tools such as ICT devices and operate them for individual purpose. Attitudes and values refer to personal preference, beliefs and moral standards that influence decision making and performance.

ICT competence includes knowledge and skills of as well as attitudes towards using ICT (Ananiadou & Claro, 2009). To analyze ICT competence in education, Ferrari (2012) says that "ICT competence is the set of knowledge, skills, and attitudes …to perform tasks; solve problems (p. 3). The European Commission identified that "digital competence involves the confident and critical use of technology for work, leisure and communication" (Punie & Cabrera, 2006, p. 17).

It is necessary to point out that "digital competence" and "ICT competence" are usually used as interchangeable concepts. However, "ICT competence" or "digital competence" is different from "ICT literacy" or "computer literacy" or "digital literacy" or "ICT skills" (Punie & Cabrera, 2006). According to the definitions identified by European Commission, "ICT literacy refers to learning to operate technology while ICT competence is not only about ICT literacy, but also about higher-order skills such as understanding what it means to live in a digitalized society" (Punie & Cabrera, 2006, p. 11). However, Educational Testing Service (ETS) (2002) gave a broad definition of ICT literacy. According to ETS, "ICT literacy is defined as using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society" (ETS, 2002, p. 2). ETS (2002) defined the terms "access", "manage", "integrate", "evaluate" and "create" as follows. In the definition, to access information means knowing how to get information. To manage information means to operate information. To integrate information means to explain and present information. To evaluate information means to judge the reliability of the obtained information. To create information means generating information by modifying, designing information. The ETS pointed out that ICT literacy not only includes cognitive proficiency but also technical proficiency. ETS

(2002) defined "cognitive proficiency" and "technical proficiency" as follows. Cognitive proficiency refers to the ability of processing, storing and extracting information. It involves memory, thinking, imagination, etc. Technical proficiency refers to skills of operating digital tools, including hardware and software. ICT literacy is closely related to cognitive proficiency and technical proficiency in the sense that people with low literacy cannot make full use of technology. For example, in order to find a solution for a medical problem via the Internet, an individual must be able to read information (cognitive) and be able to obtain information on the Internet using a search engine (technical) (ETS, 2002).

The European Commission developed a European Digital Competence Framework for Citizens known as DigComp. It was pointed out in the framework that digital competence includes five aspects and the concept of each aspect is outlined in picture 9. Totally 21 competencies are included. The framework indicates that being digitally competent not only means to use the latest smart phones or computer software, but also to use such digital technologies in a critical, collaborative and creative way (Carretero et al., 2017).

ICT competence has become one of the key competencies necessary for individuals to live better in the world. The OECD (2005) studied the key competencies needed for students to live happily and successfully in a society in the future. Three broad categories of competencies were selected in OECD's Definition and Selection of Competencies Project. OECD (2005) elaborated the three broad categories as follows. "The first category is: using tools interactively (e.g. language, technology). The tools mentioned in the first category refer to socio-cultural tools, such as language, information, and knowledge, as well as physical tools such as computers" (OECD, 2005, p. 10). The first category includes three sub-categories, i.e. "the ability to use language, symbols and texts interactively; the ability to use knowledge and information interactively; the ability to use technology interactively" (OECD, 2005, p. 10-11). It is noteworthy that ICT competence was regarded as one of key competencies for a successful life. Even more than ten years ago it was foreseen. The second category is: "interacting in heterogeneous groups" (OECD, 2005, p. 12). It means to build up interpersonal relationship with friends and peers or others in society. The second category also includes three sub-categories, i.e. "the ability to relate well to others; the ability to cooperate, work in teams; the ability to manage and solve conflicts" (OECD, 2005, p. 12-13).
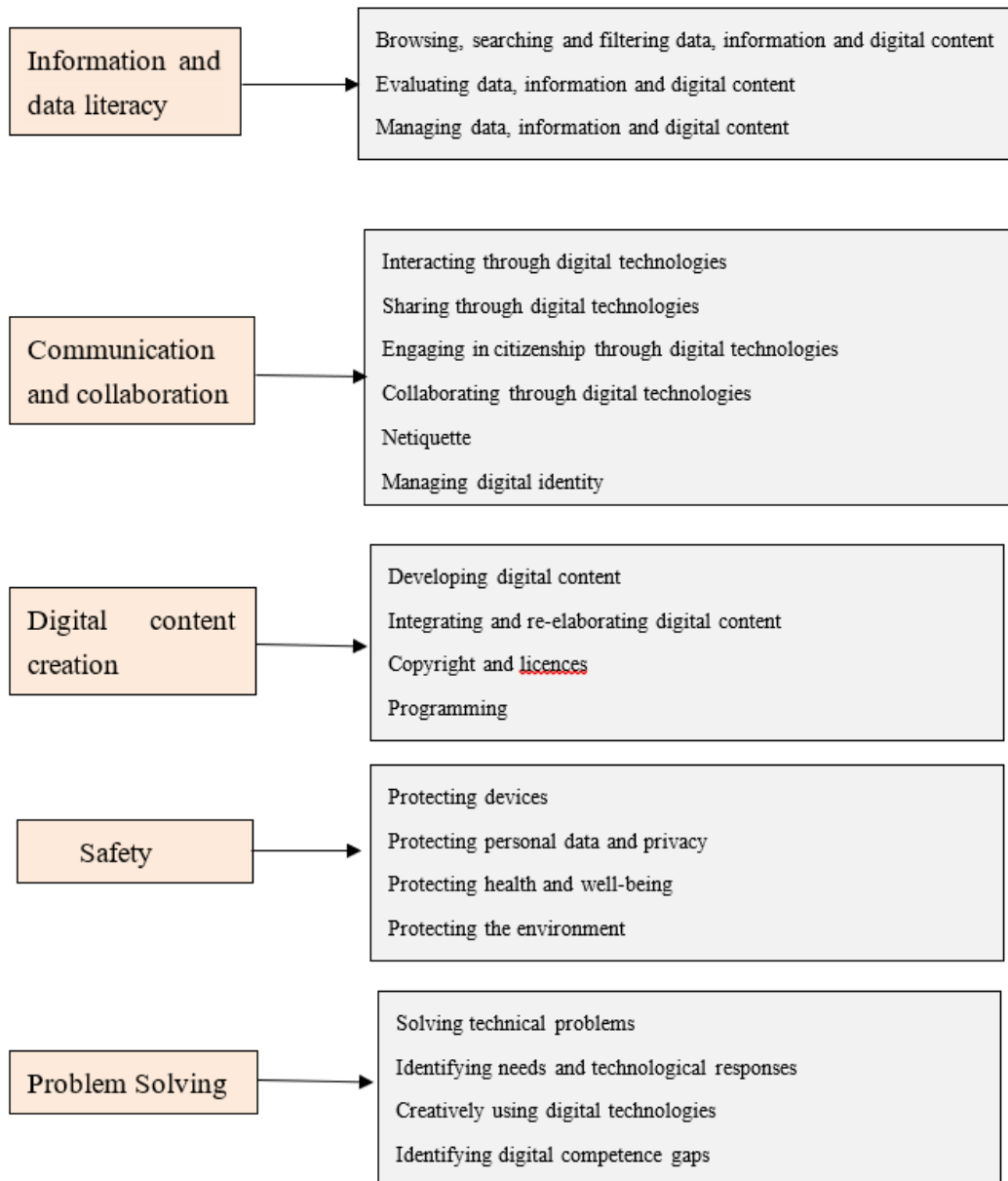
Picture 9: The DigComp Framework and 21 competencies (Carretero et al., 2017)

The third category is "acting autonomously" (OECD, 2005, p. 14). That is, an individual should be independent and can make own decisions rather than follow others. The third category includes three sub-categories as well. The first sub-category is "the ability to act within the big picture" (OECD, 2005, p. 14). That is, individuals need to consider their actions and decisions based on moral standards, laws, etc. The second sub-category is "the ability to form and conduct life plans and personal projects" (OECD, 2005, p. 15) and the third sub-category is "the ability to defend and assert rights, interests, limits and needs" (OECD, 2005, p. 15). With ICT competence, the

other two categories of competence will be easier to achieve because ICT can facilitate interaction and communication among people. Besides, ICT can also help develop critical thinking and problem-solving skills (McMahon, 2009). Table 7 is the outline of the OECD key competencies.

Table 7: The OECD key competencies (OECD, 2005)

Use tools interactively (e.g. language, technology)	The ability to use language, symbols and text interactively
	The ability to use knowledge and information interactively
	The ability to use technology interactively
Interact in heterogeneous groups	The ability to relate well to others
	The ability to cooperate, work in teams
	The ability to manage and resolve conflicts
Act autonomously	The ability to act within the "big picture"
	The ability to form and conduct life plans and personal projects
	The ability to assert rights, interests, limits and needs

Partnership for 21st century skills (P21) created a framework for 21st century skills. P21 is an organization aimed to help students worldwide to realize 21st century learning The framework includes five parts: core subjects (native language, world languages incl. English, arts, geography, history, mathematics, science, government/civics); 21st century themes (global awareness, financial, economic, business and entrepreneurial literacy, civic literacy, health literacy); learning and innovation skills (critical thinking and problem-solving skills, creativity and innovation skills, communication and collaboration skills); Information, media and technology skills (information literacy, media literacy, ICT literacy); life and career skills (flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, leadership and responsibility) (P21, 2019). It is noteworthy that ICT competence constitutes a distinct component of the 21st century skills.

It is necessary to point out that ICT competence is a temporary qualification. It is not like a driver's license which, once got, is valid forever, because new digital

technology emerges every day. People should learn new knowledge and skills of using the newly emerging technology to improve their ICT competence. Otherwise, their knowledge and skills of using technology will be obsolete and cannot meet the demand of the times. Besides, ICT competence is closely related to the situation. When the situation changes, the concept of ICT competence may change accordingly (Martin, 2006). For example, the concept of ICT competence in educational institutions is different than the concept of ICT competence in business sectors.

Nowadays, ICT has been widely used in educational settings. Most schools and classrooms are equipped with computer technology, interactive whiteboards, broadband and other digital infrastructure. On the individual level, nearly every student has a computer. The reform of education system requires new qualification of teachers. In other words, teachers are expected to be able to integrate digital technology in education to improve teaching. This competence of teachers is termed as teachers' ICT competence. Teachers' ICT competence includes knowledge and skills of, as well as attitudes towards using ICT to achieve effective teaching and learning (Ananiadou & Claro, 2009). In other words, teachers are required to effectively integrate ICT in an educational setting to enhance teaching and learning. Teachers' ICT competence has attracted attention from many aspects.

The International Society for Technology in Education (ISTE) (2016) issued technology standards for educators (teachers) called ISTE Standards for Educators. ISTE focuses on use of technology in education, such as digital citizenship in education, STEAM (science, technology, engineering, arts and math) in education, digital educational resources, Artificial Intelligence (AI) in education, teacher education (preparing tomorrow's teachers for the future of learning), online learning, etc. ISTE aims to help teachers at all levels of education achieve innovative use of technology in teaching so as to improve student learning. The ISTE Standards for Educators include seven standards: learner, leader, citizen, collaborator, designer, facilitator, analyst (picture 10). These standards aim to help teachers to reflect traditional ways of teaching, to inspire teachers to use technology effectively, to empower student learning. ISTE (2016) elaborated the mentioned seven standards as follows. The first standard is the "learner". It means a teacher is an educator but at the same time he (or she) is expected to be a learner. He should learn from others and adopt the proven pedagogical approaches to improve his teaching. Another way to learn is to attend webinars, conferences, discussions or groups where inspiring ideas are shared. A teacher should

also follow current research and read publications because there are findings on effective teaching approaches made by technology. The second standard is the "leader". Teachers are expected to act as leaders. They should advocate technology use, voice thoughts on education policy to national, state, district, school or city leaders, model effective use of new digital resources and tools for learning. The third standard is the "citizen". Teachers are expected to inspire students to behave safely, legally and ethically in a digital world. Teachers should also encourage students to make productive contribution to the digital world. The fourth standard is the "collaborator". Teachers are expected not only to collaborate with students to discover and use new digital resources or solve problems in the educational process but also to collaborate with colleagues to improve their teaching practice. The fifth standard is the "designer". Teachers are expected to design materials, activities and authentic learning environment with digital tools to support teaching and learning. The sixth standard is the "facilitator". It means teachers facilitate student learning with digital technology. ISTE (2016) also issued ISTE Standards for Students (Picture 14). Teachers are expected to be responsible for helping students obtain the ISTE standards for students. The seventh standard is the "analyst". Teachers can assess students learning and adjust current instruction based on the assessment.

Picture 10: The ISTE Standards for Educators (ISTE 2016)

In view of the importance of ICT for education, The UNESCO (United Nations Educational, Scientific and Cultural Organization) (2011) set out to study ICT competence for teachers and created the ICT Competency Framework for Teachers (ICT-CFT). The ICT-CFT includes three stages. UNESCO expounded the mentioned three stages as follows. The first stage is technology literacy. Teacher's ICT competence related to this stage involves incorporating various ICT tools in classroom for improving teaching as well as teaching students of how to use a range of ICT tools. The second stage is knowledge deepening. Comparing with the first stage (technology literacy), the second stage (knowledge deepening) emphasizes in-depth understanding of their school subjects from the perspectives of both teachers and students. Teachers must have in-depth understanding of the subjects so that they can guide students to acquire an in-depth understanding of knowledge. Teachers are expected to integrate various types of technology into their subject teaching and help students get deep understanding of knowledge. Students are expected to be able to apply the knowledge to solve complex problems in a real world. The third stage is knowledge creation. This stage focuses on creation of new knowledge with the use of ICT. Teachers are expected to use a variety of ICT tools to create learning environments for students and support students' knowledge creation. The three stages can also be seen as three different approaches to teaching (UNESCO, 2011). "Each stage includes six aspects of a teacher's work — understanding ICT in education, curriculum assessment, pedagogy, ICT, organization and administration and teacher professional learning" (UNESCO, 2011, p. 9) (Picture 11). In each stage, every aspect of a teacher's work is related with the use of ICT to achieve teaching goals. The approaches in the ICT-CFT can be used by teachers at different levels of instruction, including primary school education, secondary school education, higher education, adult education, formal and informal education.
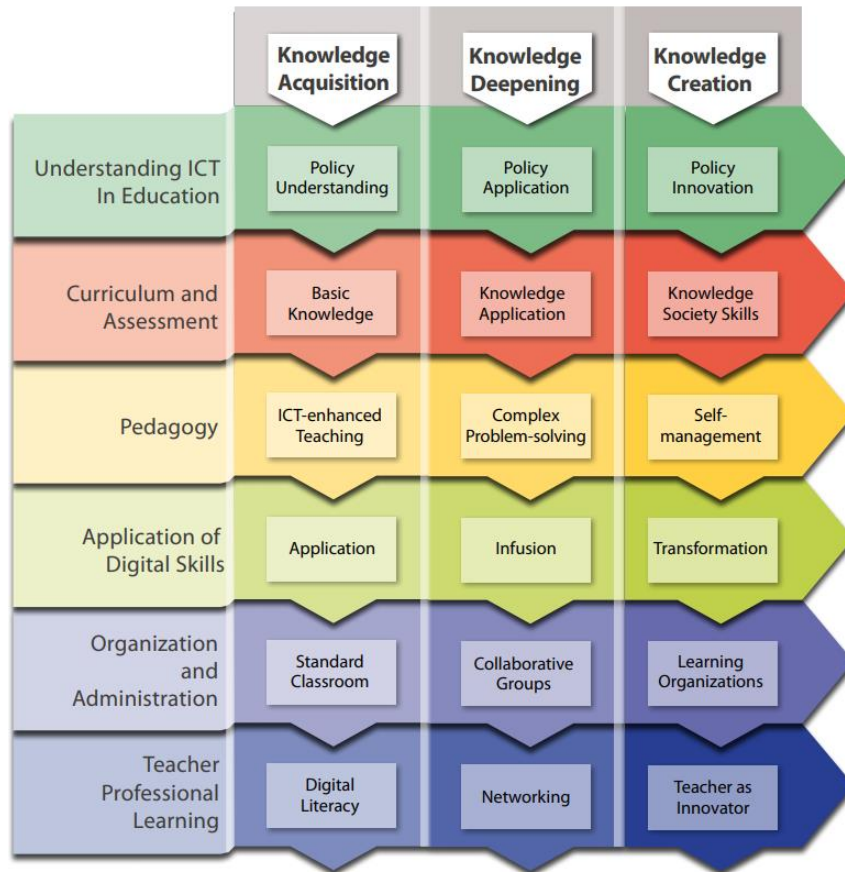
Picture 11: The UNESCO ICT competencies

The three stages are continuous and progressive. The first stage focuses on basic competence in integrating ICT in education and the second and the third stages are higher and advanced competencies needed in teaching practices. In different stages, teachers' competencies are different. UNECSO pointed out that teachers should be not only themselves digitally competent and be able to pass on digital knowledge and skills to students, but also be able to help students develop problem solving skills, innovation ability and collaborative skills. Table 8 specifies teachers' competencies in technology literacy approach. Table 9 describes teachers' competencies in knowledge deepening approach. Table 10 delineates teachers' competencies in knowledge creation approach.

Table 8: Teachers' competencies in technology literacy approach (UNESCO, 2011)

	TECHNOLOGY LITERACY
UNDERSTANDING ICT IN EDUCATION	Teachers must know policies and can make basic use of ICT to support the policies.
CURRICULUM AND ASSESSMENT	Teachers must have basic knowledge of using ICT to achieve the goal of the curriculum and must have basic knowledge of using ICT for assessment.
PEDAGOGY	Teachers must know how to use ICT in classroom teaching.
ICT	Teachers must know basic knowledge of how to operate computer hardware and software.
ORGANIZATION AND ADMINISTRATION	Teachers must be able to use ICT with small groups of students, the whole class, and individuals and enable accessibility to all students.
TEACHER PROFESSIONAL LEARNING	Teachers must know how to use digital resources to improve professional learning.

Table 9: Teachers' competencies in knowledge deepening approach
(UNESCO, 2011)

	KNOWLEDGE DEEPENING
UNDERSTANDING ICT IN EDUCATION	Teachers must understand national policies and be able to support the policies.
CURRICULUM AND ASSESSMENT	Teachers must be proficient in knowledge of subject-matter and be able to use ICT to help students get a deeper knowledge of the subject.

	Teachers must be able to use ICT to make assessment more effectively.
PEDAGOGY	Teachers must be able to adopt student-centered teaching method and facilitate student collaborative learning.
ICT	Teachers must be proficient at operating different types of educational tools and be able to use them effectively in classroom teaching.
ORGANIZATION AND ADMINISTRATION	Teachers must be able to use ICT to create student-centered learning environments.
TEACHER PROFESSIONAL LEARNING	Teachers must be able to use technology to gain information and materials related to their subject-matter to support professional learning. Teachers must be able to use technology to communicate with experts of their subject disciplines and colleagues to support their professional learning.

Table 10: Teachers' competencies in knowledge creation approach (UNESCO, 2011)

	TECHNOLOGY LITERACY
UNDERSTANDING ICT IN EDUCATION	Teachers must understand policies with respect to ICT implementation in schools. Teachers should be able to take part in school programs to support the policies.
CURRICULUM AND ASSESSMENT	Teachers must know the characteristics of student learning and be able to help develop students' critical thinking, problem solving skills, innovation

	ability with the help of ICT.
PEDAGOGY	Teachers must be able to use ICT to create a learning environment that helps students develop their innovation ability.
ICT	Teachers must be able to use various types of ICT tools to help students develop innovation ability.
ORGANIZATION AND ADMINISTRATION	Teachers should be able to build a learning community with the help of ICT.
TEACHER PROFESSIONAL LEARNING	Teachers must be able to learn continuously to improve their teaching. Teachers must be able to create new knowledge about teaching.

In Europe, there is also growing awareness that teachers' ICT competence is important for enhancing teaching and learning and that effort needs to be put into studying framework of teachers' ICT competence specific to the teaching profession (Redecker, 2017). In respond to the demand, the Digital Competence of Educators (DigCompEdu) framework was developed. The DigCompEdu framework is designed for educators at all levels of instruction, from kindergarten education to tertiary education, including vocational education, special needs education, etc. (Redecker, 2017). The aim of the framework is to promote teachers' ICT competence.

The DigCompEdu framework presents the development of teachers' ICT competence in six areas (Picture 12): "professional engagement; digital resources; teaching and learning; assessment; empowering learners; facilitating learners' digital competence" (Redecker, 2017, p. 16). The six areas are elaborated in the DigCompEdu framework as follows (Redecker, 2017). Area 1 is professional engagement. It refers to using ICT to communicate with students, colleagues, and others for professional development. Area 2 is digital resources. It refers to selecting, creating, modifying, managing, protecting and sharing digital resources. Area 3 is teaching and learning. It means the innovative use of ICT in the teaching and learning process. Area 4 is assessment. It refers to using ICT to assess students' performance in learning. Area 5 is empowering the learner. That is, students can have equal access to digital technology,

can achieve individual learning needs and can actively engage in the learning process. Area 6 is facilitating learners' digital competence. It means teachers help students acquire students' digital competence. Students' digital competence is detailed in the European Digital Competence Framework for Citizens (DigComp). Students' digital competence includes five dimensions: "information and data literacy; communication and collaboration; digital content creation; safety; problem solving" (Carretero et al., 2017, p. 11). The ability to facilitate learners' digital competence is an integral part of educators' digital competence. Teachers who are competent in using ICT in education should gain the competencies presented in the six areas in the DigCompEdu framework (Redecker, 2017).
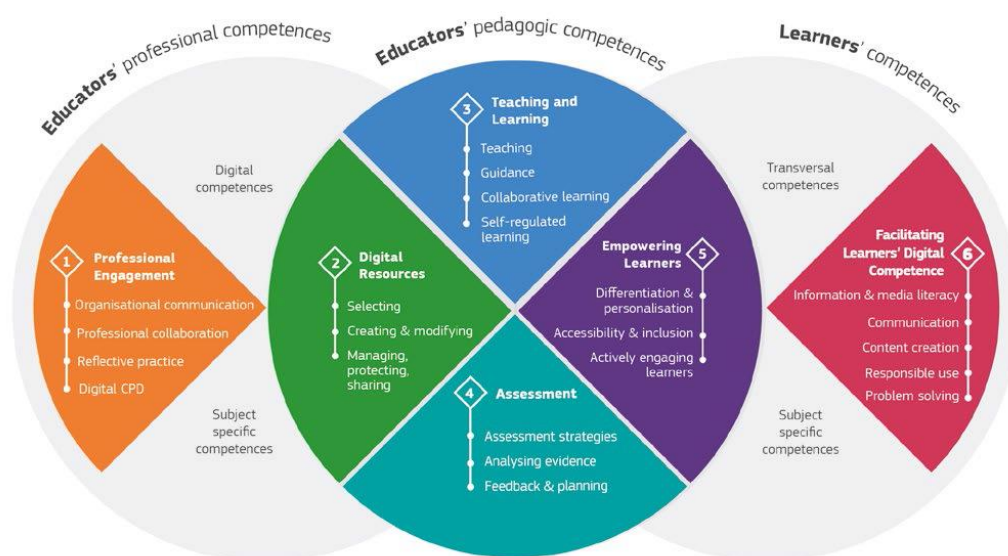
Picture 12: The DigCompEdu conceptual framework and areas of competence (Redecker, 2017)

More specifically, each broad area is equal to one broad competence. And each broad competence includes several sub-competencies. The acquisition of each broad competence is realized by achievement of the sub-competencies related to it. Totally, there are 22 sub-competencies included in the six areas. The sub-competencies in each area are explained in the DigCompEdu framework as follows (Redecker, 2017).

The area 1 (professional engagement) includes four sub-competencies: "organizational communication; professional collaboration; reflective practice; digital

continuous professional development" (Redecker, 2017, p. 19). Organizational communication means using ICT to improve communication with learners, colleagues and others. Professional collaboration is using ICT to collaborate with other teachers by sharing ideas, knowledge and teaching experience. Reflective practice means to reflect on one's own ICT integration in educational practices. Through reflection, improved teaching methods can be achieved. Digital continuous professional development refers to using ICT tools for continuous professional development.

Area 2 (digital resources) includes three sub-competencies: "selecting digital resources; creating and modifying digital resources; managing, protecting and sharing digital resource" (Redecker, 2017, p. 20). Selecting digital resources means to select suitable digital tools and resources for teaching. Creating and modifying digital resources means to generate new digital resources for teaching and modify existing digital resources. Managing, protecting and sharing digital resources means to manage digital content, to protect private digital content, to share digital content with learners, colleagues and others.

Area 3 (teaching and learning) includes four sub-competencies: "teaching; guidance; collaborative learning; self-regulated learning" (Redecker, 2017, p. 21). Teaching means to integrate ICT tools and resources in innovative ways in teaching practice in order to improve teaching. Guidance means using ICT to guide, assist and support learners in the learning process. Collaborative Learning means using ICT to facilitate learner collaboration. Collaborative learning is an educational approach under which two or more learners work together to solve a problem (Smith and MacGregor, 1992). Self-regulated learning means to enable learners to self-control their learning with the help of ICT.

Area 4 (assessment) includes three sub-competencies: "assessment strategies; analyzing evidence; feedback and planning" (Redecker, 2017, p. 21). Assessment strategies means using ICT to do assessment effectively. Analyzing evidence means using digital technology to analyze students' achievements and progress. Feedback and planning means using digital technology to provide feedback to students and parents.

Area 5 (empowering learners) includes sub-competencies: "accessibility and inclusion; differentiation and personalization; actively engaging learners" (Redecker, 2017, p. 22). Accessibility and inclusion mean to enable students to have equal access to digital technologies. Differentiation and personalization means using ICT to support

individual learning needs. Actively engaging learners means using ICT to enhance students' engagement in the teaching and learning process.

Area 6 (facilitating learners' digital competence) includes five sub-competencies: "information and media literacy; communication; digital content creation; responsible use; digital problem solving" (Redecker, 2017, p. 23). Information and media literacy means being able to teach students how to use digital technology to obtain information, to process and evaluate the obtained information. Communication means being able to teach students how to use digital technology to communicate and collaborate with others. Digital content creation means being able to teach students how to use digital technology to create different kinds of materials, works and content. Responsible use means being able to teach students how to use digital technology legally and safely. Digital problem solving means being able to teach students how to solve technical problems. Table 11- Table 16 are the outlines of the sub-ICT competencies of teachers in each area and their descriptions.

Table 11: sub- ICT competencies in area 1 and the descriptions (Redecker, 2017)

Area 1	Sub-ICT competencies	Descriptions
Professional Engagement	Organizational communication	Using ICT to improve communication with learners, colleagues and others
	Professional collaboration	Using ICT to collaborate with other teachers by sharing ideas, knowledge and teaching experience
	Reflective practice	To reflect on one's own ICT integration in educational practice
	Digital continuous professional development	Using ICT tools for continuous professional development

Table 12: sub- ICT competencies in area 2 and the descriptions (Redecker, 2017)

Area 2	Sub-ICT competencies	Descriptions
Digital Resources	Selecting digital resources	To select suitable digital tools and resources for teaching
	Creating and modifying digital resources	To generate new digital resources for teaching and modify existing digital resources
	Managing, protecting and sharing digital resource	To manage digital content, to protect private digital content, to share digital content with learners, colleagues and others

Table 13: sub- ICT competencies in area 3 and the descriptions (Redecker, 2017)

Area 3	Sub-ICT competencies	Descriptions
Teaching and Learning	Teaching	To integrate ICT tools and resources in innovative ways in teaching practices in order to improve teaching
	Guidance	To guide, assist and support learners in the learning process
	Collaborative learning	Using ICT to facilitate learner collaboration
	Self-regulated learning	To enable learners to self-control their learning with the help of ICT.

Table 14: sub- ICT competencies in area 4 and the descriptions (Redecker, 2017)

Area 4	Sub-ICT competencies	Descriptions
Assessment	Assessment strategies	Using digital technology to do assessment effectively
	Analyzing evidence	Using digital technology to analyze students' achievements and progress
	Feedback and planning	Using digital technology to provide feedback to students and parents

Table 15: sub- ICT competencies in area 5 and the descriptions (Redecker, 2017)

Area 5	Sub-ICT competencies	Descriptions
Empowering Learners	Accessibility and inclusion	To enable students to have equal access to digital technologies
	Differentiation and personalization	Using ICT to support individual learning needs
	Actively engaging learners	Using ICT to enhance students' engagement in the teaching and learning process

Table 16: sub- ICT competencies in area 6 and the descriptions (Redecker, 2017)

Area 6	Sub-ICT competencies	Descriptions
	Information and media literacy	Being able to teach students how to use digital technology to obtain information, how to process and evaluate the obtained information

	Communication	Being able to teach students how to use digital technology to communicate and collaborate with others
Facilitating Learners' Digital Competence	Digital content creation	Being able to teach students how to use digital technology to create different kinds of materials, works and content
	Responsible use	Being able to teach students how to use digital technology legally and safely.
	Digital problem solving	Being able to teach students how to solve technical problems

The DigCompEdu framework helps teachers understand how many ICT competencies a teacher needs in order to be digitally competent in education. To help teachers understand their personal level of digital competence, the DigCompEdu progression model was proposed (Picture 13). The progression model includes six proficiency levels, ranging from A1 to C2. The six proficiency levels apply to every area in the DigCompEdu framework. The proficiency levels used by the Common European Framework of Reference for Languages (CEFR), ranging from A1 to C2, was used as a reference for the creation of the DigCompEdu progression model. Just as a student may have different proficiency levels in the skills of reading, writing, listening and speaking; likewise, a teacher may have different proficiency levels of ICT competence in different areas referred in the DigCompEdu framework (Redecker, 2017).
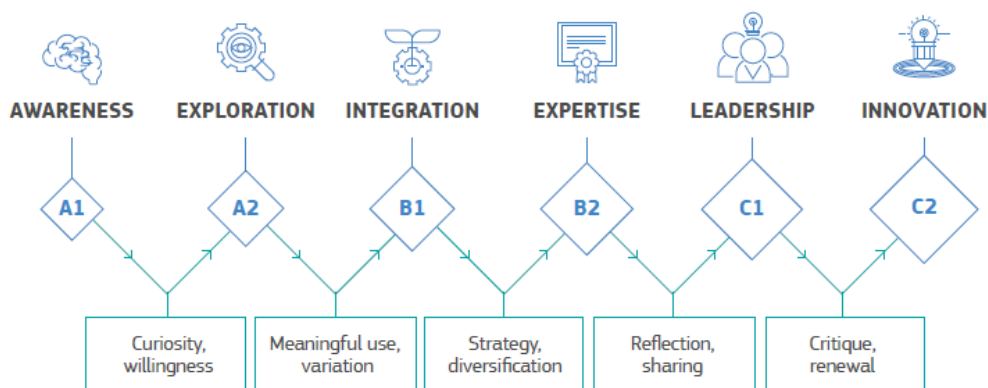
Picture 13: The DigCompEdu progression model (Redecker, 2017)

The level A1 in the DigCompEdu progression model is identified as newcomer. And A2 explorer, B1 integrator, B2 expert, C1 leader, C2 pioneer. From level A1 to level C2, the use of ICT becomes more complex. The descriptions of the six proficiency levels in each area of the DigCompEdu framework are presented in Table 17.

Table 17: Descriptions of the DigCompEdu proficiency levels

Level	Proficiency	Descriptions
A1	Newcomer	Teachers rarely use digital technology in pedagogical practices and rarely know how technology can facilitate student learning.
A2	Explorer	Teachers can make basic use of technology in teaching practices and are aware of the potential of technology for teaching and learning.
B1	Integrator	Teachers can integrate ICT in teaching and learning meaningfully and are able to foster learners' digital competence.
B2	Expert	Teachers can use technology to enhance teaching and learning and support collaborative learning.

C1	Leader	Teachers can use ICT to create digital resources and help improve students' digital competence.
C2	Pioneer	Teachers can use ICT to innovate teaching and learning and can use ICT to create complex digital resources.

Teachers' ICT competence not only influences the integration of ICT in education but also has an impact on students' ICT competence. Teachers who have no or limited competence in using ICT cannot be able to help students improve their ICT competence. The ISTE (2016) also issued ISTE Standards for Students (picture 14). Like ISTE Standards for Educators, the ISTE Standards for Students also includes seven standards: empowered learner; digital citizen; knowledge constructor; innovation designer; computational thinker; creative communicator; global collaborator. ISTE (2016) detailed the mentioned seven standards (ISTE Standards for Students) as follows (ISTE, 2016). The first standard is the *"empowered learner"*. It means students are able to use technology to enrich their learning experience and enhance learning achievement. Students have basic knowledge of how to use devices and software applications and can troubleshoot technology issues. The second standard is the *"digital citizen"*. It means students understand the rights and obligations when using technology and are aware of copyright and data privacy. Students are expected to act safely, legally and ethically in digital world. The third standard is the *"knowledge constructor"*. It means students are able to use digital tools to make creative works, such as dynamic presentation, videos, e-books, etc. The fourth standard is the *"innovative designer"*. It means students are able to use digital tools to create innovative artifacts, such as computer programs. The fifth standard is the *"computational thinker"*. It means students design a problem and are able to use digital technology to analyze data and test solutions. The sixth standard is *"creative communicator"*. It means students are able to articulate their ideas creatively by using digital tools such as interactive charts and graphs, mind maps. The seventh standard is the *"global collaborator"*. It means students can collaborate with others by using collaborative technology such as videoconferencing to work with others, to enrich their knowledge.

Picture 14: The ISTE Standards for Students (ISTE, 2016)

Teachers' ICT competence should be higher than students' ICT competence so that they can provide guidance to students. Otherwise, they would not be able to help students with gaining the above skills. Teachers' ICT competence plays an important role in the successful integration of ICT in classroom as technology itself cannot bring changes to education and its impact on education can only take effect through the people who use it, especially educators or teachers, for teachers determine whether to use technology and how to use it in classroom teaching (Jahanban-Isfahlan et al., 2017). Teachers' knowledge and skills of, as well as attitudes towards using ICT significantly affect successful integration of ICT in education (Malinina, 2015). Therefore, it is essential that they are competent in integrating ICT in teaching.

2.4.2 ICT Integration for English Teaching and Learning

Teaching EFL has been greatly changed due to the development of technology and the new emergence of ICT tools. Technology brings a lot of benefits to the process of teaching and learning (Gilakjani, 2017). "New technologies such as computers and networks are now being used in classrooms for instruction in composition, literature … handwriting, drama, in short, for every area of language arts" (Bruce & Levin, 2003, p.

651). Specifically, "ICT opens new perspectives for foreign language teachers because it expands the classroom context, sets up international partnerships … more exposure to native speakers through online systems, etc." (Titova, 2012, p. 4379).

There is a growing number of studies on the effectiveness of tablets and tablet applications for learning of English language. Chen (2013) conducted research in South China University of technology about the impact of tablet computers on language learning. The participants were ten freshmen English majors. The study showed that tablet computers were effective tools for language learning if students could make full use of the technological affordances. A study by Wang et al. (2015) was conducted in a Taiwanese university about the effect of ipad APP on students' English vocabulary acquisition. The research subjects were 74 students studying in a private university. The study showed that the experimental group that used ipad APP to learn English vocabulary had better performance in the post-test than the control group that used the traditional semantic-map method. In other words, ipad APP had a positive effect on English language learning. Couvaneiro and Pedro (2015) researched on the use of tablets in teaching English as a foreign language. 53 Portuguese 8th grade students and two teachers were involved in the study. Questionnaires and interview were used to do the research. The result indicated positive effects of tablets on teaching-learning process, which were proved by the development of English oral competence of students and a more active participation of students. Alhinty (2015) studied the use of various tablet applications (apps) for children's learning of English as a foreign language. The results indicated that tablets can be used as educational tools to facilitate young children's English language learning. Bitter and Meylani (2016) studied the effects of a mobile English-speaking software application called "Qooco Kids English" on children's spoken English. In the research, the Qooco Kids English was used to teach children to speak English. The children were grade 5 and grade 6 students aged 10 to 12 years old in Chiang Rai Municipality schools 6 and 7 in Thailand. The pre-and post-tests indicated that the Qooco Kids English software could develop student achievements in both spoken and written English.

Studies about the benefits of using digital educational games in EFL learning also abound in recent years. Ashraf et al. (2014) conducted a study on whether online games can significantly affect learning of English vocabulary by Iranian EFL learners. The subjects in the experiment were 45 students aged 16 to 22. The experimental group could use online games to learn English vocabulary while the control group learned

English vocabulary by traditional methods characterized by pen and pencil technique. The results indicated that the experimental group had a better performance than the control group in the post-test. In other words, online games were effective tools for English vocabulary acquisition. In accordance with the findings of Ashraf et al. (2014), Yip and Kwan (2006) studied the effectiveness of online games on students' EFL vocabulary learning. The subjects in the study were undergraduate students studying engineering in the Hong Kong University of Science and Technology. They compared the vocabulary mastery of students who used online games to learn English vocabulary with that of those students who learned vocabulary without the aid of online games. The findings indicated that online games had a positive effect on students' EFL vocabulary learning. The study also showed that both teachers and students viewed online games as effective vocabulary learning tools. Students in the study said they preferred online games as a learning tool to the traditional learning methods. Ebrahimzadeh and Alavi (2017) studied educational potential of a digital video game to see whether it can facilitate students' vocabulary learning. The participants of the study were 136 male EFL students aged 12 to 18. Pre- and post- test were used to examine students' performance in learning vocabulary. The result indicated that students got better performance in vocabulary posttest. In other words, digital video games helped language learners with vocabulary learning by making learning process enjoyable. Chen and Lee (2018) explored the effectiveness of an educational game on young children's learning of English vocabulary. The participants were 30 primary school students. The results showed that the digital educational game could assist young children in learning English vocabulary. Digital educational games can also help improve students' English listening and speaking skills. Liu and Chu (2010) investigated a case study on the differences between the experimental group who used ubiquitous games to learn English and the control group who used a non-gaming method. The participants were 64 students aged 13-14 and three high school teachers. The results showed that the ubiquitous games had an impact on the learning outcomes and students' motivation of English learning. In other words, ubiquitous game can help improve students' learning outcomes and students became more motivated in the learning process. Students in the study said that ubiquitous games could create an authentic language environment for them to practice oral English.

Studies on the use of interactive whiteboards for English teaching and learning have also attracted researchers in recent years. Dudáková (2013) conducted research on

the use of interactive whiteboards in teaching English in the Czech Republic. The participants were EFL teachers from kindergartens and primary, secondary language schools. The questionnaire was used to collect data in the survey. In the study, the majority of teachers held the view that interactive whiteboards were helpful in many areas of English teaching, including vocabulary, grammar, listening, reading, writing, speaking, etc. They believed that interactive whiteboards made teaching more effective. Katwibun (2014) studied the effectiveness of interactive whiteboards in vocabulary teaching in the context of Thailand. The subjects were 51 high school students. The study showed that implementing interactive whiteboards as an instructional tool in vocabulary teaching could improve students' vocabulary knowledge. It could also increase students' participation and motivation in English learning. Zezulková (2017) conducted a study on the engagement of students with the interactive whiteboards in English lessons. The participants were 90 students of a primary school. The result indicated that interactive whiteboards could enhance the engagement of students and enjoyment of lessons.

Table 18: Advantages of using ICT in teaching English as a foreign language (based on reviewed literature)

Advantages of using ICT in teaching English foreign language
Creating an interactive, collaborative environment for language learning
Improving learning outcomes
Providing opportunities for practicing speaking in an actual environment.
Supporting individual learning
Providing rich materials from the Internet for English learning
Making learning more interesting
Enhancing motivation of English learning

Some researchers pointed out negative aspects of using ICT tools in English teaching and learning. Time consumption is a universal factor. Some teachers said that it took them a lot of time to find teaching materials suitable for a particular class. Besides, some teacher mentioned that the poor quality of devices and equipment is another negative aspect of using ICT. Quite often, teachers are concerned with students' spelling skills due to frequent use of technology (Malinina, 2015).

Table 19: Disadvantages of using ICT in teaching English Foreign language (based on reviewed literature)

Disadvantages of using ICT in teaching English foreign language
Time consumption
Distraction of learning
Low spelling skills of students

In general, the advantages of using ICT in teaching EFL outweigh the disadvantages. Due to the advantages brought by ICT, ICT have been widely used in teaching practice in educational institutions nationwide. Educational digitalization has become a priority and a focus of educational revolution in many countries as there is a consensus that educational digitalization is a fundamental way to cultivate students. Governments from all over the world have been exploring the best way suited to their countries to infuse ICT in education.

2.4.3   Teacher Education

Teacher education can also be called teacher training or teacher learning. The aim of teacher education is to train teachers to be competent so that the quality of teaching could be ensured. Teacher education is regarded as an important way to prepare future teachers' attitudes, knowledge and skills required for effective technology integration in their future classrooms (Baran et al., 2019). Baran et al. (2019) investigated the impact of teacher education strategies on preservice teachers' TPCK. 215 preservice teachers were involved in the study. The result indicated that there was a strong

connection between preservice teachers' learning experience in their teacher education programs and their development of TPCK-practice. In other words, teacher education programs could increase teachers' technology integration in the process of teaching. The finding concurs with Kee's conclusion. Kee (2012) investigated the impact of training experience on student teachers' feeling of readiness. He found that student teachers who had training experience felt more prepared regarding the integration of technology in teaching than those who did not have training experience.

In view of the value of teacher education, OECD (2019b) carried out a study on initial teacher preparation (ITP) from 2016 to 2018. The study aimed to inform policy makers, school leaders and educators of how to improve future teachers' competence in teaching. The study pointed out that a sound initial teacher education program should include a systematic initial teacher education curriculum covering all knowledge needed. Besides, the curriculum should respect changes and reforms in the curriculum in school contexts where future teachers will work. In other words, initial teacher education curriculum should respond to the realities of schools. In addition, new emerging evidence on effective teaching and learning should be included in the initial teacher education curricula as new research on effective teaching and learning are emerging every day from various sources. Teacher education program should not only provide future teachers with knowledge but it should also help develop practical skills of future teachers that allow them to give instruction. Collaboration between schools and universities is regarded as an efficient way to achieve this. The study also pointed out that experienced teacher educators are also crucial to teacher education programs. Teacher educators should be competent in teaching future teachers and be knowledgeable in integrating new emerging evidence and new models in teaching. The study also highlighted that an effective teacher education program should provide induction support to beginning teachers. In other words, it should provide beginning teachers with support in the early years of their teaching career in schools. The aim of the induction support is to help beginning teachers solve problems and overcome difficulties in real schools.

Roberts-Hull et al. (2015) created a teacher education pathway which includes six stages, encompassing selection into initial teacher education, progression through initial teacher education, exit from initial teacher education, teacher registration, hiring and first year(s) of teaching. They elaborated the six stages as follows. The first stage is selection into initial teacher education. It means to set admission standards. Only

those students who meet the admission standards can be enrolled in teacher education. The second stage is progression through initial teacher education. It means excellent teacher education program should be taken to help future teachers become well-prepared. The third stage is exit from initial teacher education. It means to set graduation requirements. Only those students who meet the graduation requirements can successfully graduate. This measure can ensure the quality of new teachers in society. The fourth stage is teacher registration. "Teacher registration refers to the stage after a teacher completes their initial teacher education course but before they can be employed. Sometimes it is referred to as teacher certification or teacher licensure" (Roberts-Hull et al., 2015, p. 4). Usually there is a registration exam. Requirements at the registration stage help to filter poor teacher candidates. The fifth stage is hiring. It means using hiring criteria to select best teacher candidates. This measure can encourage teacher candidates to attend the best teacher education programs and teacher education providers to offer the best programs). The sixth stage is first year(s) of teaching. It means schools provide feedback on the skills of beginning teachers to the teacher education providers and the teacher education providers can improve their programs accordingly (Roberts-Hull et al., 2015).

Beyond that, many countries, realizing that competence of teachers is the prerequisite for high-quality instruction and learning outcomes, have attached much importance to teacher education. Darling-Hammond (2017) studied well-developed teacher education programs in the following four countries: Finland, Australia, Canada, Singapore. The teacher education initiatives and policies in the mentioned four countries are elaborated in sequence below. Finland has invested intensely in initial preparation of teachers since 1979. The initial preparation for teachers in Finland is well-designed and high-quality. Due measures have been taken to ensure a well-developed teacher education system. There are strict standards for admission to teacher education. Only those with strong academic ability and a passion to teach can be selected as candidates. The country also highly respects practical skills of future teachers. Clinical learning takes place in special teacher training schools which are responsible for training beginning teachers. In Finland, government supports initial preparation of teachers. Teachers get salaries while they are in training. Due to the well-developed teacher education, teaching quality in Finland is high. Students from Finland performed very well in all aspects on the PISA (Program for International Student Assessment). In the same vein, in Australia, much effort has been devoted to teacher

education. Many teacher education programs in Australia are supported by governments. The country helps built partnership between universities and schools aimed at the development of practical skills of future teachers. In recent years, a national professional standards framework for teachers has been created which details what teachers should know for professional development. The country also develops performance assessments for evaluating beginning teachers' capacity to teach. In Australia, beginning teachers are provided with induction support in their early career. The similar initiatives have been conducted in Canada in recent years. The teacher preparation is also supported by the government in Canada. Recruitment for admission to teacher education is strict. High grade point averages are required. A profession-wide approach is adopted to spread evidence-based practices throughout classrooms and schools to improve teachers' capacity in teaching. In addition, there are a set of competencies guiding ongoing practice and teachers are evaluated based on these competencies. The country also values clinical experience for future teachers. Partnership between universities and schools is established to provide clinical experience. Recently, an induction program has been enacted to provide a range of supports for new teachers, including orientation, study issues and professional development. With these measures, students have achieved great improvement in their studies. In line with the initiatives, Singapore has also provided supports in the teacher preparation and induction process. The support is reflected in finance as well as in policy. The country creates a career ladder which specifies the expectation for preparation at each stage, which helps teachers become qualified teacher educators or curriculum specialists. Meanwhile, a highly developed performance management system has been established to evaluate and support teaching practice. School-university collaboration is developed to support clinical practice. Besides, mentor teachers have a definite mission to support new teachers in their early years of service.

The aim of teacher education is to improve quality of teaching and, through this, outcomes of student learning. From the above analysis, it is indicated that the effectiveness of teacher education is associated with many factors including the content of training, mentor teachers, admission standards, graduation requirements, induction support in the beginning year of teaching, policy support, etc. Generally, the following strategies can be adopted to improve quality of teachers:

Method courses

Subject-specific method courses in teacher education are usually designed for teaching future teacher teaching strategies (Keeler, 2008). As for technology integration in education, Keeler (2008) provides examples of using a range of technology in a content subject methods course. He elaborated the use of course Web site in teaching which contained lesson plans, lecture slideshows, audio of class lectures, basic course resources, the use of blogs, cell phones as communication tools, the use of audio aids for feedback, the use of concept mapping software, content-specific software in instruction, the use of e-portfolios for submissions of assignments, just to name a few. Pre-service teachers in the study stated that the method courses helped them be effective teachers. Ödalen et al. (2019) studied the effects of pedagogical training courses at six Swedish universities. The research adopted quantitative methodology. 183 university teachers were the subjects who participated in pedagogical training courses. In the study, most teachers said that the courses were very useful and their pedagogical skills improved.

Field Experience

"To prepare effective teachers for 21st century classrooms, teacher education must shift away from a norm which emphasizes academic preparation and course work loosely linked to school-based experiences. Teacher education programs must be fully grounded in field practice and interwoven with academic content and professional courses. Teacher education programs must work in close partnership with school districts to redesign teacher preparation to better serve prospective teachers and the students they teach" (National Council for Accreditation of Teacher Education, 2010, p. ii).

Field experience is a means to connect theory and practice, allowing knowledge learned at universities to be applied into practice. Field experience which can be viewed as practicum or internship often takes place at schools. Studies have shown that field experience can help to prepare future teachers. Akinde et al. (2017) studied the value of field experience for international students. Data was collected by survey, interview and field log. The participants were 10 international students. The students stated that the field experience was invaluable. They said they learned a lot about curriculum and instruction from the filed experience. The finding concurs with Akarsu and Kaya's

conclusion (Akarsu & Kaya, 2012). Akarsu and Kaya (2012) conducted a study to explore the effectiveness of practicum courses. A total of 164 pre-service teachers were involved in the study. Both qualitative and quantitative research methods were adopted in the study. The practicum courses included school experience and teaching practice. The result indicated that the majority of the pre-service teachers stated that practicum courses were useful for their future teaching. The study also revealed that cooperating teachers in schools are crucial to the effectiveness of field experience (Rozelle & Wilson, 2012). Study by Rozelle and Wilson (2012) indicates that future teachers often modelled themselves on teaching pattern or teaching methods of their cooperating teachers, they even used the cooperating teachers' script and instructional presentations. In other words, cooperating teachers' teaching style and behaviors significantly influenced prospective teachers.

Case Methods

A case method is another pedagogical means used to improve teacher education. "The cases may be examples of specific instances of practice or exemplars of principles, exemplifying in their detail a more abstract proposition or theoretical claim" (Shulman, 1986, p. 11). Cases can make knowledge and skills understood easily (Doyle, 1990). Doyle (1990) argues that "cases can be used as precedents to exemplify the procedures and the issue of teaching as well as prototypes to develop essential knowledge about teaching events" (p. 14). Cooperating teachers and mentor teachers can use a case method for teacher education. Koc (2011) studied the value of video cases in teacher education from the perspectives of pre-service teachers. The participants were 97 pre-service teachers. The study employed qualitative research methods. The pre-service teachers were asked to create video cases simulating classroom realities. They could consider classroom situations from their observations in the coursework or from their own memories from their primary, secondary, or university education. The pre-service teachers were also asked to analyze the cases they created and share the cases with peers. The participants stated that video cases made learning easier compared to the printed materials and also made learning more enjoyable. They also said that the video cases could be a model teaching them how to integrate technology into teaching in their future career.

Cases methods not only can be used in coursework in teacher education, but also

can be utilized in teacher education practicum. Tülüce (2016) explored the opinions of pre-service English language teachers on the effectiveness of a case story method in teacher education in the context of Turkey. The participants were 21 future English language teachers. The case story method was conducted in the practicum course through which the pre-service teachers observed classroom activities, wrote case stories, and shared case stories via seminars. The analysis of the data elicited from a focus group interview and post-course reflection papers indicated that the majority of pre-service teachers stated that the case story method had a positive impact on their learning because it could foster involvement in the practicum observations. In addition, the case story method enabled them to make reflection both on their current practicum observation and their prior learning experience, which is vital to professional development. The result also showed that most pre-service teachers held the view that the case story was helpful for their future teaching. For example, one of the pre-service teachers said: *"I had the opportunity to understand what I might face in the real teaching field when I begin my teaching career. It helped me to identify many solutions to possible problems I might face in the future"* (Tülüce, 2016, p. 1286).

Learning Communities

"The concept of a learning community is based on a premise from the business sector regarding the capacity of organizations to learn" (Vescio & Adams, 2008, p. 81). Kruse et al. (1995) said the characteristics of a learning community include five aspects – "reflective dialogue, de-privatization of practice, collective focus on student learning, collaboration, shared values and norms" (p. 9). They define the term "reflective dialogue", "de-privatization of practice", "collective focus on student learning", "collaboration", "shared values and norms" as follows (Kruse et al., 1995). Reflective dialogue means members of a learning community communicate with each other about all aspects of teaching and self-reflect their teaching practice. De-privatization of practice means members of a learning community show their classroom teaching to others. That means teachers of the learning community learn from each other by classroom observation. Collective focus on student learning means the main task of a learning community is to improve student learning. Collaboration means members of a learning community work together to develop teaching practice. Shared values and norms mean members of a learning community have common social values, beliefs,

moral standards, ideas of teachers' responsibility, etc. Studies have indicated that a learning community is another way to promote professional development of teachers. Haddix (2015) studied the role of community engagement in teacher education. In the study, pre-service teachers were asked to attend a community event. The study showed that the community engagement benefited pre-service teachers. A pre-service teacher in the study said, "the sense of community and feeling of connecting with students in a way that was not graded was valuable to me" (Haddix, 2015, p. 69). In the same vein, a study by Harfitt (2018) indicates that a learning community plays a significant role in preparing teachers. The participants were 136 teacher candidates required to participate in a community-based task which was a mandatory component of the teacher education program. Qualitative methodology was adopted to collect perceptual data from the teacher candidates. The study showed that a well-organized learning community could make pre-service teachers more attentive to students' needs and help develop pedagogical skills of pre-service teachers. In addition, in the study pre-service teachers saw mentor teachers and staff from the community as role models. Some pre-service teacher said, "my mentor was there every day giving me advice and encouraging me to try new things…if ever I become a mentor to a student teacher, I will try to be the same as my mentor was to me" (Harfitt, 2018, p. 9). Moreover, as mentioned above, one of the characteristics of a learning community is collaboration. Through collaboration, pre-service teachers can also learn from their own peers. In the study some pre-service teacher said, "I leaned more from our collaboration than from my own efforts" (Harfitt, 2018, p. 10).

Teacher Research

"Teacher research refers to a form in which the teacher conducts research on or inquiries into his/her own practice. Self-study is the same process used by teacher educators" (Richardson, 2001, p. 15486). The aim of teacher education is to improve quality of teaching (Richardson, 2001). The BERA-RSA (British Educational Research Association-Action and Research Centre) studied the role of research in teacher education. The study was based on substantial evidence and the result showed that teachers' research literacy had a positive impact on the quality of teaching. The concept of research in the study is inclusive. It not only includes literature review of research publications, but also other forms of research such as group discussion about

professional development, analysis of school data, investigation, thematic research (e.g. research focusing on a certain topic). The study identified four main ways in which research can make contribution to teacher education: "first, the content of teacher education programs may be informed by research-based knowledge and scholarship; second, research can be used to inform the design and structure of teacher education programs; third, teachers and teacher educators can be equipped to engage with and be discerning consumers of research; fourth, teachers and teacher educators may be equipped to conduct their own research" (BERA-RSA, 2014, p. 5).

The research-based approach is a typical paradigm of teacher research in teacher education. It allows for teaching while studying. It is an effective way to integrate theory and practice (Toom et al., 2010). However, "the main goal of research-based approach is not to educate researchers, but to develop student teachers' pedagogical thinking, because they can think and approach their work in an inquiry manner" (Toom et al., 2010. p. 336). Colucci-Gray et al. (2013) found out that action-research project had a positive impact on teachers. Action research is a process of inquiry in which teachers investigate their practice critically. Similarly, Toom et al. (2010) conducted a study on the research-based approach to teacher education in the context of Finland. Both quantitative and qualitative methodologies were adopted in the study. 278 student teachers and 33 teacher educators were involved in the study. The results indicated that the student teachers thought that a research-based approach was valuable for teacher training and teacher educators said that research-based teacher education encouraged them to conduct research related to curriculum development.

2.5   Previous Research on EFL Teachers' ICT Competence and Its Development

This dissertation attempts to study future EFL teachers' ICT competence and its development. The topic is based on the following considerations. On the one hand, English is an international language and is widely use in the world (Nishanthi, 2018). English plays a more and more important role in our work and life. Many books and websites are written in English. In majority of business and science, English skills have become requirements. The importance of English can never be overestimated. Therefore, there is an increasing number of people studying English; on the other hand, ICT is a proven tool that can greatly improve the effectiveness and efficiency of

teaching and learning. Education informatization has become a priority of many countries. Many schools and universities have been equipped with computers with various built-in software applications, interactive whiteboards, projectors, the Internet, etc. It can be concluded that it is an inevitable trend to incorporate ICT in education. Integrating ICT in English teaching is a trend of this era. However, "the most important thing about ICT in education is not the governmental policy but teachers themselves; their attitude towards ICT and its use at their lessons, their competencies to work with it" (Malinina, 2015, p. 75). Teachers determine what technology to be used and how technology is used in teaching (Mehan, 1989). Mehan (1989, p. 4) states that "it is not the features inherent in the machine but what people do with the machine that determine how microcomputers will be used in education". Therefore, there is a need to study EFL teachers' ICT competence.

EFL teachers' ICT competence has been studied by some scholars in recent years. According to Sysoyev and Evstigneev (2014), the ICT competence of a foreign language teacher refers to the ability to use digital technology to help students develop language skills. Sysoyev and Evstigneev (2014, p. 83-84) said a foreign language teacher should have knowledge and skills to do the following things:

"1) General use of ICT in teaching a foreign language, including informing students the basics of information security, searching and evaluating information for educational purposes, organizing interaction in the educational process by ICT.

2) Creating the five types of educational resources in a foreign language teaching (Hotlist, Multimedia Scrapbook, Subject Sampler, Treasure Hunt, WebQuest).

3) Using Web 2.0 technology in learning a foreign language (blogs, wikis, podcasts, bookmarks, etc.), including using concordances to develop grammatical and lexical skills of speech, using online tests to manage learning, using the Internet communication in learning a foreign language (e-mail, web forum, Skype, etc.), etc."

Sysoyev and Evstigneev (2014) argue that a foreign language teacher's ICT competence not only includes the above knowledge and skills, but also includes awareness of the importance of using ICT in teaching and the ability to reflect his or her own ICT use in teaching practice. Thus, the authors summarize that a foreign

language teacher's ICT competence includes the following five interrelated components: "value-motivational, cognitive, operational, communicative and reflective components" (Sysoyev & Evstigneev, 2014, p. 84). They define the terms "value-motivational component", "cognitive component", "operational component", "communicative component", "reflective component" as follows (Sysoyev & Evstigneev, 2014). The value-motivational component refers to understanding the benefits of using ICT in teaching. The cognitive component refers to knowledge of using various types of technology in language teaching. The operational component refers to the ability to integrate ICT in language teaching. The communicative component refers to the ability of sharing language teaching experience with other teachers. The reflective component refers to the ability of teachers to self-reflect their teaching practice for improvement of teaching methods

In addition to the theoretical studies, there are some empirical studies on EFL teachers' ICT competence as well. Overall, the empirical studies on this topic can be categorized into two broad groups. The first group is: the studies on EFL teachers' computer literacy or ICT competence or ICT literacy; the second group is: the studies on EFL teachers' technological pedagogical content knowledge (TPCK). The first group focuses on EFL teachers' computer literacy or ICT competence or ICT literacy. This group of studies mainly focuses on technical mastery of ICT skills of EFL teachers. The second group focuses on EFL teachers' technological pedagogical content knowledge (TPCK). The two groups of studies are elaborated below.

The first group - the studies on EFL teachers' computer literacy or ICT competence or ICT literacy are presented below.

Malinina (2015) studied foreign language teachers' ICT competence in the context of Russia. Respondents were primary, secondary and high school foreign language teachers. Questionnaire, interview and observation were employed in the research to collect data. The study focused on the following six aspects of basic ICT skills of foreign language teachers: "file navigation; email; the Internet; word processing; presentation packages; spreadsheets" (p. 77). The results indicated that foreign language teachers had basic level of ICT skills.

Al Khateeb (2017) studied in-service EFL teachers' digital competence in the context of the Kingdom Saudi Arabia. The participants were 110 in-service EFL teachers from primary, intermediate, and secondary schools. Quantitative methodology

was employed in the research. The study examined EFL teachers' ICT competence in five areas: "information processing; communication; control creation; safety and problem solving" (p. 39), which are proposed in the European Digital Competence Framework for Citizens (DigComp) (Carretero et al., 2017). The findings indicated that the majority of EFL teachers were incompetent in the five areas although most of the teachers had ICT- related certificates.

Røkenes and Krumsvik (2016) investigated secondary English as a Second Language (ESL) student teachers' ICT competence through a didactics course offered at a teacher education program in Norway. Data were collected through surveys, participant observations, and semi-structured interviews. A digital competence model was used to analyze ESL student teachers' ICT competence. The model identified that ESL student teachers' ICT competence included four components: "basic digital skills; didactic ICT competence; learning strategies and digital Bildung (development)" (p. 3-4). Based on the above criteria, the study indicated that ESL student teachers had high basic digital skills. However, some ESL student teachers expressed that they knew little about the didactic use of digital technology because they did not have learning experience with ICT from prior schooling, higher education, and teacher education. The study also indicated that student teachers were not good at making full use of interactive whiteboards so the interactive whiteboard was simply used as a screen to show PowerPoint. This is because, as some ESL student teachers claimed, their mentor teachers were incompetent in using various digital tools, including interactive whiteboards. In the end, the study proposed seven suggestions for the development of student teachers' ICT competence: "modeling didactical ICT-use for student teachers; scaffolding student teachers' learning experience with ICT; teacher educator linking theory and practice; raising student teachers' awareness through reflection; providing student teachers with access to resources and support; fostering student teachers' innovative assessment practices; encouraging collaborative learning among student teachers" (p. 8-16).

Sysoyev and Evstigneev (2015) studied in-service EFL teachers' ICT competence in Russia. The participants were 46 EFL teachers of Derzhavin Tambov State University and National Research Tomsk State University. The study examined EFL teachers' ICT competence in the following four aspects: basic use of ICT in language teaching (finding information, processing the obtained information, etc.); the use of online software (Filamentality) in language teaching; the use of communication tools in

language teaching; the use of Web 2.0 technologies in language teaching (YouTube, blog, wiki, etc.). The results showed that most teachers had skills of searching information on the Internet and evaluating Internet resources for educational purposes. However, most teachers were not familiar with the use of Filamentality and Web 2.0 technologies in teaching English as a foreign language except for using reference sources (online encyclopedias and dictionaries) in teaching English as a foreign language.

Razak et al. (2010) investigated IT competence of language teachers in Malaysian technical schools. Questionnaires and interview were the research methods. The samples were 56 English teachers from 14 technical schools in Malaysia. The study examined English teachers' ICT competence in eight aspects: "knowledge on computers and its social impact; operational basics; basic Internet; computer assisted learning and teaching; web-based learning and teaching; computer mediated communication; computer assisted management; assessment and evaluation" (p. 152). The results showed that most of English teachers in Malaysian technical schools were not competent in the eight aspects. Due to low competence, the use of computers for teaching was limited in the schools. The study also indicated that most training focused on basic ICT skills. Training on advanced technology use were rarely provided to EFL teachers. Moreover, teachers' attitude towards computers was negative. There was a high level of anxiety among teachers regarding using technology. This partly explained low ICT competence of the teachers.

Benali et al. (2018) explored digital competence of Moroccan teachers of English. The research subjects were 160 Moroccan English teachers. Quantitative methodology was employed in the research. The competencies listed in the DigCompEdu framework were used as references to examine self-assessment of English teachers' ICT competence. The result indicated that the majority of participants were confident in using ICT in teaching. They were competent in using ICT to find digital resources to enhance teaching. However, they were not competent in using digital technology to do formative and summative assessment effectively. Also, they had low competence in teaching students how to use digital technology for knowledge creation. In addition, the study also indicated that digital teaching confidence and years of teaching experience were positively related to the teachers' digital competence.

Jamalvandi et al. (2017) dealt with Iranian EFL teachers' CALL literacy. The participants were 140 EFL teachers from Iranian high schools. The study examined EFL

teachers' CALL literacy from four aspects: the ability of using digital communication tools in language teaching, the ability of evaluating online information, the ability of integrating multimedia in language teaching, basic computer skills. Quantitative methodology was adopted in the research. The findings showed that the Iranian EFL teachers possessed a moderate level of CALL literacy. More specifically, teachers' literacy on using online communication tools for language teaching was not satisfactory. Teachers' literacy on evaluating online information was moderate. Teachers' multimedia literacy was average, and teachers had high literacy on basic computer skills. EFL teachers were recommended to improve knowledge and skills of using ICT to enhance teaching. The study also indicated that gender and teaching experience had no significant relationship to CALL literacy. However, academic degree can significantly influence teachers' CALL literacy.

Jahanban-Isfahlan et al. (2017) made effort to uncover Iranian high school EFL teachers' use of technology in their classroom teaching and their attitudes towards technology. The participants included 120 junior and senior high school Iranian EFL teachers and over 600 junior and senior high school students. Quantitative methodology was employed in the study. The results indicated that Iranian teachers were not sufficiently competent to use ICT in their classes although they had positive attitudes towards technology.

Dashtestani（2014）conducted a study to explore Iranian EFL teachers' computer literacy. The participants were 263 EFL teachers. Both quantitative and qualitative methodology were used in the study. The results of the study indicated that the participants did not have sufficient knowledge and skills of using ICT in language teaching although they had positive attitudes towards using technology in teaching. The study also revealed that the following factors, such as training in pedagogical use of ICT, school leadership support, time for improvement of computer skills, can influence teachers' ICT competence.

Ardıç and Çiftçi (2019) studied EFL teachers' ICT competence in the context of Turkey. The participants were 193 in-service EFL university teachers. Quantitative methodology was used in the study. EFL teachers' ICT competence was measured by self-assessment of knowledge and skills of ICT in seven areas: "word processing skills; spreadsheet skills; database skills; electronic presentation skills; web/Internet navigation skills; graphic tools skills; integration skills" (p. 162). The results showed that the EFL teachers had low skills in the seven areas. The study also indicated that

most EFL teachers needed ICT training courses. The EFL teachers preferred to gain pedagogical use of ICT in language teaching rather than theoretical knowledge and technical mastery of ICT.

Son et al. (2011) examined computer literacy of Indonesian teachers of English as a foreign language. Quantitative methodology was employed in the study. The participants were 73 in-service Indonesian teachers of EFL at schools and universities. The study was based on EFL teachers' self-assessment of their computer skills and their use of computer applications in teaching. The result indicated that the EFL teachers were incompetent in the use of CALL. Most teachers had basic ICT skills, but they did not know how to use web 2.0 technology, such as blog, wiki etc., to improve English language teaching.

Correos (2014) studied on EFL teachers' ICT literacy in the context of the Philippines. The study examined English teachers' ICT literacy from seven aspects: "general computer knowledge; file management knowledge; system maintenance and security knowledge; word processing skills; communication skills (E-mail); Web skills and presentation skills" (p. 3). The participants were 30 secondary school EFL teachers. The results indicated that teachers were competent in basic computer operation skills, file management skills and word processing skills. They had moderate knowledge of communication skills (E-mail), Web skills and presentation skills. However, they were incompetent in computer maintenance and security. The study also revealed that technology was rarely used in language teaching.

The second group - the studies on EFL teachers' technological pedagogical content knowledge (TPCK) are presented below.

Turgut (2017) studied whether pre-service English language teachers' perceived TPCK increased after they completed a four-year teacher education program. The program included three courses: computer I and II, and CALL. 176 pre-service English language teachers were involved in the study. Both quantitative and qualitative methodologies were adopted in the study. The results of the study indicated that senior pre-service EFL teachers had highest level of TPCK based on self-assessment. The findings also revealed that school teachers' TPCK was very limited and technology was rarely used in the schools although Turkish government had made substantial investment in schools in the form of technology.

İşler and Yildirim (2018) investigated Turkish pre-service EFL teachers' TPCK. The study employed quantitative and qualitative methodologies, i.e. questionnaires and interviews were used to collect data. A total of 94 Turkish pre-service EFL teachers were involved in the study. The findings showed that most participants had an average or high level of TPCK and two participants were with low level of TPCK. The study highlighted the importance of teacher education. It was suggested that teacher education should provide pre-service teachers with courses that would teach them how to integrate technology into content and pedagogy to improve teaching.

Solak and Cakir (2014) studied the TPCK competence of pre-service English teachers in Turkey. 137 pre-service English teachers from a state-run university were the subjects. Quantitative methodology was used in the study. The results revealed that pre-service teachers' TPCK competence was high overall, but they had limited competence in solving technical problems with computers. It was also found that females' pedagogical knowledge was higher than the males' knowledge and males were better in technological knowledge than females.

Öz (2015) explored pre-service EFL teachers' level of TPCK. The participants were 76 undergraduate students who studied in an English language teaching program in a university in Turkey. The participants did the survey in their final semester. Both qualitative and quantitative research methods were employed in the study. The study indicated that the teachers generally had high level of TPCK. However, not all teachers put the acquired TPCK into practice in order to promote learning outcomes. That means knowledge and skills of TPCK do not guarantee their practical use in language teaching. The study also showed that university professors used various technologies in classrooms and taught students how to use technology to improve English teaching, while cooperating teachers in practice schools did not use technology because the administration put a ban on it. Some teachers used interactive whiteboards just for presenting the installed course books.

Koçoğlu (2009) explored the TPCK of pre-service EFL teachers in language education in the context of Turkey. The author used interviews to gather data. 27 student teachers studying in the fourth year of their teacher education program participated in the study. The findings showed that the computer-assisted language learning course was beneficial for the development of pre-service teachers' TPCK.

Studies on the development of teachers' ICT competence also attract researchers' attention. However, studies on the development of EFL teachers' ICT competence are very few. Most studies focus on the development of ICT competence of teachers in general. The studies indicate that well-organized training courses and experienced teacher educators are helpful means of developing teachers' ICT competence. For example, Kamalodeen et al. (2017) studied the development of teachers' ICT competence in using web 2.0 tools through an ICT professional development program. The program lasted four months. The participants were early childhood, primary and secondary school teachers. By the end of the training, they were asked to self-perceive their development of competence in using web 2.0 tools. Most of the teachers reported that they gained competence and confidence in using Skype, videoconferencing tools, emails, blogs, and wikis after taking part in the initiative. Petelin et al. (2019) reveals that training courses are means to develop teachers' ICT competence. Gonda (2016) studied ICT competence of teacher trainees and its development in the context of Hungary. He points out that teacher educators play an important role in the development of teacher trainees' ICT competence because student teachers usually model themselves on their mentors' teaching practice.

In general, there is an increasing number of publications in recent years on EFL teachers' ICT competence (or ICT literacy or ICT skills) and EFL teachers' TPCK. The ICT competence (or ICT literacy or ICT skills) mentioned in most of the studies included in the first group is defined as technical mastery of ICT skills including basic computer skills such as finding information, word processing; presentation packages; spreadsheets. It is noteworthy that EFL teachers' ICT competence is not just technical mastery of ICT skills and it emphasizes integrating ICT effectively to improve teaching and learning (Lawless & Pellegrino, 2007). Research by Røkenes and Krumsvik (2016) reported that some EFL teachers expressed they were good at using technology, but they were not good at using technology in teaching. Similarly, a study by Keeler (2008) also showed that pre-service teachers knew how to use specific technological tools, but they rarely knew how to integrate the tools in education. A digitally competent teacher should have the ability to effectively integrate ICT in education to be better at teaching and help students learn creatively and critically, rather than using ICT for searching information on the Internet or making presentation for content delivery (Lawless & Pellegrino, 2007). Second, regarding country distribution of the publications, the current research mainly focuses on the following countries: Iran, Turkey, Norway,

Morocco, Saudi Arabia, Malaysia, Russia Indonesia and the Philippines. Most research focused on the context of Turkey and Iran. Third, with respect to the adopted methodology, most research employed quantitative methodology or mixed methodology. Fourth, with regard to the development of EFL teachers' ICT competence, studies on this topic are very few. Most of the existing studies focus on the development of ICT competence of teachers in general.

3 RESEARCH METHODOLOGY AND DATA ANALYSIS

In order to successfully achieve the set objectives in the dissertation, it is necessary to choose appropriate research methods which would enable us to obtain the needed data showing measurable facts in educational practice. We have chosen the methods based on considering the accessibility of the data and the need of obtaining the target data. We have used the funds from the granted projects "Teachers' attitudes towards innovations in the curriculum of informatics and professional preparation of EFL Teachers in using information technology in class" (2018), "Curricular innovations of the subject of computing in the context of the teachers' opinion and research of optimal preparation of future EFL teachers for the use of information technology in class" (2019) and "Research of factors influencing interest in study of technological subjects teaching and possibilities of ICT implementation in education" (2020), funded by Palacky University in Olomouc. The research survey is characterized by intensive contact with the research participants. The research method reflects a close connection between theory and practice. When making the research design, we have also gained experience from other research surveys and the published results which we analyzed, as discussed in previous chapters.

3.1 Research Design and Approach

The study aims to investigate professional preparation of future EFL teachers' ICT competence in teaching English as a foreign language. The future EFL teachers refer to current graduate students majoring in English as a foreign language. They will become lower secondary school EFL teacher after their graduation.

A mixed methodology is employed to collect data. In other words, both qualitative and quantitative methods are used. "Quantitative methodologies focus on measurable factors in a wide range of sampling, they usually only reflect the effects of the variables operationalized in the research design and qualitative methodologies, on the other hand, have the potential to provide a rich and multifaceted insight into multidimensional

perspectives and values, but do not easily facilitate with any degree of certainty provable generalization from data" Guo (2016, p. 27). The qualitative methods used in the study are document analysis and personal interview (especially the part that can be described as non-standardized where we tried to capture the broader relationships between the phenomena studied). This enabled us to avoid the danger of concentrating too much on the stage of individual, isolated phenomena. In our case, the quantitative method is a standardized part of the interview, in which invariable questions and their clear wording are given in advance, while the exact order of the questions is also observed during the interview, as a different order of questions could influence the verbal conduct of the respondents. Quantitatively, the results of such a survey can be compared relatively easily and allow for a statistical evaluation to be carried out. The wording and structure of the questions asked can be found in Appendix 1. When formulating and asking these questions to the respondents, we observed the principles for conducting interviews, see e.g., Chráska (2016), Hendl and Remr (2017).

Personal Interview is a method of gaining rich and deep information about the respondents' ideas and opinions. Through personal interview, an interviewer asks questions "in a face-to-face contact to other person or persons" (Kothari, 2004, p. 97) and records the respondents' ideas verbatim (Kothari, 2004). "The method of collecting information through personal interview is usually carried out in a structured way. Such interviews involve the use of a set of predetermined questions and of highly standardized techniques of recording" (Kothari, 2004, p. 97). "Thus, the interviewer in a structured interview follows a rigid procedure laid down, asking questions in a form and order prescribed" (Kothari, 2004, p. 98). Compared to an unstructured interview in which "an interviewer can ask supplementary questions or omit certain questions when the situation changes, a structured interview ensures comparability of one interview with another" (Kothari, 2004, p. 98). In addition, "the analysis of unstructured interview is more challenging and time-consuming" (Kothari, 2004, p. 98). Therefore, in the study, we have adopted the structured interview.

In the course of the interviews, we scaled the respondents' answers to individual questions to do justice to quantification requirements. "The Likert-type scales are developed by utilizing the item analysis approach wherein a particular item is evaluated on the basis of how well it discriminates between those people whose total score is high and those whose score is low. The scales consist of a number of statements which express either a favorable or unfavorable attitude towards the given object. Respondents

are asked to respond to each of the statements in terms of several degrees, usually five. Each response is given a numerical score and the total score represents the respondent's position on the continuum of favorable-unfavorable towards an issue" (Kothari, 2004, p. 84).

In the study, personal interviews are carried out to interview college and university EFL teachers. The questions in the interview adopt Likert type five-point scales ranging from strongly agree to strongly disagree (see Appendix 1). The interviews aim to explore the professional preparation of future EFL teachers' ICT competence and the ways of how to develop it if there is a need from the perspectives of college and university EFL teachers. The questions for interviewing college and university teachers include three parts (see Appendix 1). Part one which includes seven questions (question 1 to question 7) is related to the first issue (what is the level of professional preparation of the future EFL teachers' ICT competence?). Part two relates to the topics of ICT-related courses. This section is to answer the second question (how to develop the future EFL teachers' ICT competence if there is a need to develop it?). The third part of the questionnaire relates to personal information, including gender, age, teaching experience, etc.

Bowen (2009, p. 27) said that "document analysis is a systematic procedure for reviewing or evaluating documents". The author also argues that "documents can be analyzed as a way to verifying findings or corroborating evidence from other sources" (p. 30). Information and insights elicited from documents are supplementary and valuable research data. The process of document analysis includes content analysis and thematic analysis (Bowen, 2009). "Content analysis is the process of organizing information into categories related to the central questions of the research" (Bowen, 2009, p. 32). "Thematic analysis is a form of pattern recognition within the data, where emerging themes become the categories for analysis" (Fereday & Muir-Cochrane, 2006, p. 82).

In the research, document analysis is realized by reviewing the course syllabi for developing future EFL teachers' ICT competence, aiming to get information about professional preparation of future EFL teachers' ICT competence within current curricula.

In our research, we worked with two questions:

1. What is the level of the professional preparation of the future EFL teachers' ICT competence?

2. How to develop future EFL teachers' ICT competence if there is a need to develop it?

Triangulation is adopted to answer the first question. Triangulation refers to using two or more approaches to study a problem and compare findings (Cohen et al., 2007). "The use of multiple methods contrasts with the ubiquitous but generally more vulnerable single method approach. Triangulation is a powerful way of demonstrating validity" (Cohen et al., 2007, p. 141). That means, if different methods of data collection yield the same results, the researcher will be more confident about the findings (Cohen et al., 2007). Methodological triangulation is reflected in using three different methods to collect data, including document analysis, interview and questionnaire, as shown below (picture 15).

Picture 15: Research design for question one

The analyzed documents are course syllabi of the universities for future EFL teachers. We analyze the course sylalbi on the basis of the number of courses, the content of the courses (what students will learn from the courses) and the nature of the courses (mandatory or selective) to see whether the current curricula are sufficient enough to develop future EFL teachers' ICT competence. The content analysis of the course syllabi is based on the concept of teachers' ICT competence we have adopted in the study. That is to say, we will judge whether the courses can help future EFL teachers develop their knowledge, skills of and attitudes towards innovative ICT-use in future professional teaching. Here innovative ICT-use refers to integrating ICT in education for the improvement of teaching and student learning instead of simple use of ICT such as searching for information on the Internet or using ICT as presentation tools for

content delivery. As some research findings discussed in the previous chapter argue, some teachers are good at using ICT, but they are not good at using ICT in teaching (Røkenes & Krumsvik, 2016). Also, we analyze whether the courses are mandatory or selective. If they are selective, we believe that the curricula are insufficient to develop future EFL teachers' ICT competence because no matter how good the course is, it is optional.

The interviews are carried out to collect data from college and university EFL teachers. The interviews are conducted in the form of face-to-face contact. The interviews aim to explore professional preparation of future EFL teachers' ICT competence from the perspectives of college and university EFL teachers. The interviews are audio-recorded. A trial of interviews is made in order to identify whether there are any inappropriate items. The questions in the interview for answering the first question in the study are presented in part one of Appendix 1 (question 1 to question 7).

To answer the second question, topics of ICT-related courses are created to obtain information from college and university EFL teachers about whether the topics of ICT-related courses should be incorporated into current curricula for the improvement of future EFL teachers' ICT competence. There are eight topics regarding using ICT in teaching English as a foreign language. The college and university EFL teachers are asked to respond to each topic, stating to what extent they think the topics should be included in current curricula to develop future EFL teachers' ICT competence. The questions are presented in part 2 of Appendix 1.

3.2 Research Assumptions and Hypothesis

The theoretical analysis carried out in chapter 2 stressed the necessity of a quality professional preparation of future teachers as far as their ICT competences are concerned. What we mean are not just digital skills themselves but also the ability to use them in teaching. The studies that we analyzed did not suggest a way of developing ICT competences of future EFL teachers in Czech or in Slovak republic as no researcher has taken a systematic approach to this issue so far. Therefore, we can consider the first sub-goal of this dissertation thesis fulfilled. Nevertheless, it is necessary to focus on the other two sub-goals that relate to the following presuppositions:

Sub-goal No. 2: On the research basis, to analyze the university course syllabi focusing on the development of future EFL teachers' ICT competence.

Research assumption 1: University degree programs preparing future EFL teachers, in most cases, include courses aimed at ICT competence development.

Research assumption 2: Courses that focus on ICT competence development are more focused on user skills development.

Sub-goal No. 3: On the research basis to find out the opinions of professional preparation of future EFL teachers' ICT competence from the perspectives of selected university teachers.

Research assumption 3: University teachers believe that the current curricula are sufficient enough to develop future EFL teachers' ICT competence.

Research assumption 4: University teachers believe that training in using ICT for introducing new learning material is included in the university study to a greater extent than training in other ICT competencies.

To rule out the effects of gender, age, or nationality on the form of university teachers' responses (based on research assumptions 3 and 4), we tested the following hypotheses.

Hypothesis 1

H$_1$: The opinions of academic employees on developing ICT competence in professional preparation of future EFL teachers are not dependent on gender.

H$_{10}$: The opinions of academic employees on developing ICT competence within the existing curricula of professional preparation of future EFL teachers are the same in case of men and women.

H$_{1A}$: The opinions of academic employees on developing ICT competence within the existing curricula of professional preparation of future EFL teachers differ in case of men and women.

Hypothesis 2

H$_2$: The opinions of academic employees on developing ICT competence in professional preparation of future EFL teachers are not dependent on age.

H$_{20}$: The opinions on developing ICT competence in professional preparation of future EFL teachers are the same in case of younger and older academic employees.

H$_{2A}$: The opinions on developing ICT competence in professional preparation of future EFL teachers differ in case of younger and older academic employees.

Hypothesis 3

H$_3$: The opinions of academic employees on developing ICT competence in professional preparation of future EFL teachers are not dependent on the Slovak or Czech citizenship.

H$_{30}$: The opinions on developing ICT competence in professional preparation of future EFL teachers are the same in case of academic employees in the Slovak and the Czech Republic.

H$_{3A}$: The opinions on developing ICT competence in professional preparation of future EFL teachers differ in case of academic employees in the Slovak and the Czech Republic.

3.3 Subjects of the Study - Characteristics of the Research Samples

EFL teachers who later work in primary schools are trained at universities in state-accredited courses. Our research was carried out at the following universities:

- University of Hradec Kralove,

- Palacký University in Olomouc,

- Charles University,

- Masaryk University in Brno,

- University of Ostrava,

- Technical University of Liberec,

- Jan Evangelista Purkyně University in Ústí nad Labem,

- University of West Bohemia in Pilsen,

- University of South Bohemia in České Budějovice,

- University of Pardubice.

- Constantine the Philosopher University in Nitra

Preparing teachers in the Czech Republic is regulated by the state through the Accreditation Commission (formerly) and the National Accreditation Office (now). When studying the curriculum documents that relate to the courses of study at the individual universities, certain analogies can be deduced. The courses of study do not differ very much in the areas of focus, and one can state that the courses at all the universities mentioned are structured (initially at the bachelor's level and later at the master's level). At some universities, after successfully completing your master's degree, you can take the state dissertation and present your dissertation thesis, thus acquiring a doctorate (so-called small graduation; it is not a PhD). The curricula of all universities also show some congruence in teaching subjects such as morphology,

syntax, lexicology, phonetics, British and American literature and educational practice. However, there is the question of how each university approaches the development of competencies of future teachers in relation to the use of ICT in the classroom. This relates directly to the topic of this dissertation.

In view of the similarity of the courses and as a demonstration, we will be presenting the profile of a graduate of the English language course with a focus on pedagogy (bachelor's degree) implemented at the Pedagogical Faculty of Palacký University (STAG, 2020):

Graduates of the bachelor's degree in English with a focus on pedagogy acquire general and specific knowledge in the field of linguistics, English and American literature and primary sources. In practical language experience, they achieve overall level C1 of the Common European Framework of Reference for Languages.

After completing the degree, they will be able to do the following:

- o *Demonstrate solid theoretical knowledge of English phonetics, phonology, morphology, syntax and lexicology,*

- o *Demonstrate broad knowledge of British and American literature based on their own study and analysis of the basic core of these kinds of literature, as well as acquiring knowledge of basic secondary literature,*

- o *Demonstrate an understanding of basic cultural and historical knowledge of English-speaking countries,*

- o *Use the English language in practical communication (productive and receptive) at least at level C1.*

The graduate will be prepared for further studies in the postgraduate master's course in English language teaching for primary schools at the Pedagogical Faculty of Palacký University in Olomouc or at other pedagogical faculties. Due to the nature of the course, the graduate can find a job in the education sector, mainly first and second levels of primary schools, as an assistant to teachers. Aside from education, they can work in commerce or in the area of culture, e.g., in travel agencies, banks, advertising and language agencies or in administration.

This bachelor's degree is followed by a master's degree in teaching English at primary schools with the following graduate profile (STAG, 2020):

The performance profile of the master's graduates reflects the special pedagogical and methodological orientation of the two-year course. Hence, the course is primarily geared towards building up and developing pedagogical skills and further developing communicative language skills, so that graduates can achieve language proficiency level C 1.

After graduation, the students will be able to do the following:

- o *Demonstrate sound theoretical knowledge in special linguistic disciplines — sociolinguistics, pragmatics and text analysis,*

- o *Demonstrate knowledge of contemporary British and American literature as well as children's and young adult literature on the basis of their own in-depth study and analysis of selected parts of the relevant literature, as well as their study of a wide range of relevant secondary literature,*

- o *Demonstrate good didactical knowledge and skills,*

- o *Use the English language in practical communication (productive and receptive) at least at level C 1.*

After successfully completing the master's degree, the graduates are qualified to teach English at primary and lower secondary levels.

From an exploratory viewpoint, research is being carried out at the curriculum document level in all universities preparing EFL teachers for primary education level 2. Although it will be a great challenge to analyse numerous documents, this study can yield remarkable insights as it will be possible to interpret the results with a certain degree of accuracy. One was able to implement this quite well during the COVID-19 pandemic, although the movement of people and access to university buildings was severely restricted. Although the document analysis could be quite sufficient, we wanted to understand the studied phenomena more deeply and therefore conducted interviews with curriculum guarantors and key players who are very much involved in preparing future EFL teachers. The attributes of the respondents who took part in the interviews are listed in Table 20.

Table 20: The Characteristics of the Participants

Demographic characteristics	Number	percentage
Gender		
Males	4	24%
Females	13	76%
Teaching experience		
≤2 years	0	0%
3-5 years	3	17.6%
6-10 years	6	35.3%
10+ years	8	47.1%
Age		
≤30 years	1	5.9%
31-40 years	6	35.3%
41-50 years	6	35.3%
51+ years	4	23.5%
Publish articles related to teaching English		
Yes	16	94.1%
No	1	5.9%

3.4 The Procedure of Data Collection

Research in the field of document analysis, in the sense of studying the curricula of individual ICT-oriented courses, was carried out at all the universities mentioned above. This was made possible by the fact that the individual curricula are freely available to the public. Only sensitive data, such as the names of the students enrolled in individual courses, are not disclosed. However, these data are not needed for our research and therefore do not pose an obstacle in any way. We were thus able to create a complete database of documents that could be further subjected to comparative analysis.

We use document analysis to study the professional preparation of future EFL teachers' ICT competence because the curricula are an indicator of the professional preparation of the future EFL teachers' ICT competence. We focus on the number, the content and the nature of the ICT-related courses for future EFL teachers. The content of the course refers to what the students will learn from the courses. The nature of the course refers to whether the course is mandatory or selective.

While comparative analysis provided remarkable answers to a number of questions, we needed to go deeper below the surface. Therefore, standardized interviews were conducted by university teachers. All universities were contacted, but only 2 universities replied back and agreed. The arguments of the universities that were not involved were high workload preventing interviews from being carried out and the protection of know-how. None of the universities involved wanted to have their names published in connection with the data or their interpretations.

To get knowledge from abroad and to make comparisons, we turned to universities in Slovakia with the request to carry out a research study. Two universities replied back and agreed to our request, and so we were able to conduct interviews with a larger number of employees — university teachers. The interviews were carried out at all locations through personal contact, which positively increased the validity of the results.

3.5 The Procedure of Data Analysis

The data for this research consists of course syllabi, interview transcripts and questionnaire responses. The questionnaire is included in the interview as we adopted a structured interview. We interviewed the college and university teachers by following the predetermined questions.

The course syllabi, which are ICT-related courses of colleges and universities for future EFL teachers, are analyzed on the basis of the number of the courses, the content of the courses (what students will learn from the courses regarding using ICT in teaching English as a foreign language) and the nature of the courses (the courses are selective or mandatory). The aim of this analysis is to answer question 1 in the dissertation (what is the level of the professional preparation of future EFL teachers' ICT competence?). Examples of course syllabi analysis are presented in table 21.

Table 21: Examples of course syllabuses analysis

University	Name of the course	M/B	Compulsory /optional /required optional	Specific for future EFL (Yes/No)	If there are compulsory courses for future EFL teachers
U1	Practicum of Didactic Technology	B	Required optional	No	No
	Methodology of E-learning	B	Required optional	No	
	Practical Activities with ICT	B	Required optional	No	
U5	Websites Development	B	optional	No	Yes
	Cloud Data Processing	B	optional	No	
	Didactics of English Language III	M	compulsory	Yes	
	Didactics of English Language I	M	compulsory	Yes	

In order to ensure the anonymity of the selected colleges and universities, the colleges and universities in the study are named as U1, U2, U3….

The data from interviewing college and university EFL teachers (the questions in part 1 of Appendix 1) are also used to answer question 1 in the dissertation. The data are analyzed through transcription, coding, classification, illustration and summary. Below is the demonstration of the analysis (table 22).

Table 22: Examples of participants coding

Theme: Current curricula are sufficient enough to develop future EFL teachers' ICT competence

Codes	Explanations
T1, T2, T5-SD	T1: I don't think they are sufficient enough right now. T2: I would say "NO". I strongly disagree. The current curricula in the university don't incorporate ICT education for teachers. There is no specific subject. T5: I don't think that they are sufficiently prepared for ICT use in their future position as a teacher of primary school level.
T3-SWD	T3: I, not completely, but somewhat disagree. There is just one subject. It is not enough.
T6, T9-SWA	T6: It can be strengthened somewhat, because what we teach is just to implement ICT in teaching. But we don't use the real equipment which is used in the real school (primary school). T9: I choose "somewhat agree" because the students prepare PowerPoint presentations. As they prepare PowerPoint presentations, they somewhat develop their ICT competence.

In the table, T1 = university teacher 1, T2 = university teacher 2, T3......, T9 = university teacher 9.

SA = Strongly Agree, SWA = Somewhat Agree, N = Neither Agree nor Disagree,

SWD = Somewhat Disagree, SD = Strongly Disagree

As for the data from interviewing college and university EFL teachers about the topics of ICT-related courses (part 2 in Appendix 1), i.e. to what extent they think the topics of ICT-related courses are necessary to be included into current curricula to improve future EFL teachers' ICT competence, we analyze the information in terms of mean, median, minimum, maximum, standard deviation, variance, etc. Results from the data are used to answer question 2 in the dissertation (how to develop future EFL teachers' ICT competence if there is a need for development?).

In addition, the data from interviewing college and university EFL teachers are categorized by age (young and old), gender (man and women), and region (Czech Republic and Slovakia) and analyzed by the Chi-square tests. The results from the analysis are used to answer hypothesis 1, hypothesis 2 and hypothesis 3 in the dissertation.

3.6 Exploration and Content Analysis of the University Courses

The data analysis was a demanding activity because through the adopted research methods we managed to obtain a large number of materials, particularly syllabi—key documents capturing the concept of teaching at specific university courses. The elaboration of the work lasted several weeks as it was necessary to repeatedly return to the field. Qualitative methodology required interpreting individual topics of the courses, which were included in individual syllabi, and conceptualizing them in the form of mental abstraction, so that their meanings would not deviate from the original meanings.

By adhering to the principles of qualitative research, see e.g. Wittrock (1989), in addition to methodological flawlessness, we also monitored the validity and reliability of the entire research survey. In particular, the following principles were observed:

- Repeatability - this means that anyone else can use the same standard to generate similar information;

- Systematicity - the aim is to ensure that our existing ideas are not influenced by a wrong choice of research subjects and their responses.

- Credibility - refers to the construction of questions and to the way they are asked. The questions must be meaningful and adequate for generating valid phenomena related to the study in question.

- Transparency – refers to the tools, methods, and research techniques adopted in the research. Obtaining research materials and the elaboration of the text should be clear for the recipients of the research and the results should be presented in a distinct study where the research is described as far as its data collection, data elaboration, data analysis, and interpretation are concerned.

Our analysis of individual syllabi includes the analysis of all education content with the aim to identify the features of a perspective curriculum—that is the learning content linked to ICT which is essential for the teaching profession in the 21st century and which is applicable in the school practice.

The process of analysis, comparison, evaluation, categorization, coding, and conceptualization were carried out through open coding. In respective syllabi, we explored their goals, the purpose of individual university subjects, and the competences that they develop. From a methodological perspective, it is a thematic analysis used to connect seemingly incompatible materials so as to identify their common themes. This kind of analysis is used for analyzing and obtaining qualitative information about a person, group, certain situation, organization or culture (see Lowe, Norris, Farris, Babbage 2018, Braun, Clarke 2012). Is is also used as a tool of obtaining deeper understanding of information gained in the research.

The procedures of analysis will be further demonstrated by data obtained from individual study programs aimed at training future EFL teachers. Individual syllabi are always studied in detail and for the purposes of further research, the data are presented regarding the objectives and content focus of individual subjects which aim to develop ICT competence of future EFL teachers. Individual topics in the content of the courses are coded, as shown in Table 23.

Table 23: Categories, concepts and codes used in the research

Interpretation categories	Concepts	Codes
Didactics of ICT	Working with interactive whiteboards and didactic aspects of using a computer, working with a data projector, using a tablet and other digital technologies.	DI
Using ICT to search for new knowledge	Searching for information in local databases and on the Internet.	SN
Using ICT for online teaching and LMS	Working with programs for online video communication and e-learning systems.	OT
Using ICT for	Working with software for administration	TM

administration related to teaching.	related to teaching.	
Training in basic ICT knowledge and skills	They learn to master ICT.	UI
Subject specific didactics of ICT	Field didactic focus on working with ICT	SD

3.6.1 University no. 1

There are eight courses related to the development of ICT competence: *Practicum of Didactic Technology; Methodology of E-learning; Practical Activities with ICT; Application of Information and Communication Technology I; Basics of Computer Science I; Basics of Computer Science II; Methodology of Work with Interactive Instructional Systems; Multimedia in Teaching Foreign Language.*

Practicum of Didactic Technology

The aim of the course is to acquaint students with various didactic technologies. The course is a compulsory elective course and is for students of the bachelor's degree program. The course is not specific for students majoring in English foreign language. The content of the course includes:

- didactic technology, basic concepts, definitions, classification /DI/
- school whiteboard, types and specifics of school whiteboards, methodology and work with interactive whiteboards /DI/
- work with interactive whiteboards, presentation of seminar work /UI/
- classical audiovisual technology, training in working with common audiovisual technology /UI/
- video technology, training in working with video technology, editing /UI/

- digital video technology, digifoto, digivideo, DVD, visualizer, data projector, audiovisual presentation /UI/

- electronic education, virtual school, LMS Moodle—creation of educational material for e-learning /OT/

Methodology of E-learning

The aim of the course is to acquaint students with methodology of e-learning. The course is a compulsory elective course and is for students of the bachelor's degree program. The course is not specific for students majoring in English foreign language. The content of the course includes:

- introduction to e-learning /DI/

- technological means of electronic education /DI/

- E-learning software /OT/

- systems of e-learning /OT/

- use of text editors in e-learning /OT/

- use of spreadsheets in e-learning /OT/

- use of presentation tools in e-learning /OT/

- use of publishing tools in e-learning /OT/

- use of bitmap editors in e-learning /OT/

- use of vector editors in e-learning/OT/

- use of video editors in e-learning /OT/

- use of audio editors in e-learning /OT/

Practical Activities with ICT

The aim of the course is to acquaint students with general knowledge of ICT. The course is a compulsory elective course and is for students of the bachelor's degree program. The course is not specific for students majoring in English foreign language. The content of the course includes:

- computer, properties, and their classification /UI/

- input and output in devices /UI/

- internet, www, http, url, hyperlink /UI/

- explanation of terms: POP3, SMTP, FTP, TCP/IP, cookie, internet /UI/

- buffer in internet browser /UI/

- internet security and digital signature /UI/

- e- mail, e-mail address, advantages and disadvantages of e-mail /UI/

- the principles and possibilities of communication through: chat and discussion group, instant messengers, social network /UI/

- netiquette and its rules /UI/

- using web services for collaboration /UI/

Application of Information and Communication Technology I

The aim of the course is to acquaint students with the text editor and the function of spreadsheet. The course is a compulsory elective course and is for students of the bachelor's degree program. The course is not specific for students majoring in English foreign language. The content of the course includes:

- introduction to ICT (hardware, software) /UI/

- introduction to office packages /UI/

- getting to know the text editor /UI/

- working with a text editor (formatting document, inserting objects…) /UI/

- advanced work with the text editor (styles, automatic lists) /UI/

- getting to know the spreadsheet /UI/

- working with spreadsheets (formatting, conditional formatting, functions) /UI/

Basics of Computer Science I

The aim of the course is to acquaint students with basics of computer science. Students will gain specific skills in the field of computer science. The course is a compulsory elective course and is for students of the bachelor's degree program. The course is not specific for students majoring in English foreign language. The content of the course includes:

- searching information (internet environment, database, internet services) /SN/

- creating documents (text editor, template) /UI/

- structure of the document (paragraph, section) /UI/

- paragraph format (bullets, numbering, columns, tabs) /UI/

- styles and heading /UI/

- references (citation) /UI/

- graphic objects in documents /UI/

- tables and charts (creating tables and charts in a text editor) /UI/

- revision of the document and printing /UI/

- advanced editing options in a text editor /UI/

Basic of Computer Science II

The aim of the course is to acquaint students with the spreadsheet and the presentation. The course is a compulsory elective course and is for students of the bachelor's degree program. The course is not specific for students majoring in English foreign language. The content of the course includes:

- work with the spreadsheet (workbook, cells, table, etc.) /UI/

- calculation and functions (creation of formulas, basic functions) /UI/

- work with data /UI/

- creating and editing charts /UI/

- basics of presentation (slides, texts, colors, shapes, images, albums) /UI/

- animation and effects in presentation /UI/

Methodology of Work with Interactive Instructional Systems

The aim of the course is to help students understand operation of interactive whiteboards for teaching purposes. It is an elective course and is for students of the bachelor's degree program. The course is not specific for students majoring in English foreign language. The content of the course includes:

- operating principles of interactive whiteboards /DI/

- menus and toolbar, objects /DI/

- sorting images, gallery, pictures /DI/

- writing text /DI/

- drawing- background color, line, styles, shapes /DI/

- inserting audio and flash files /DI/

- making video recordings /DI/

- other SMART tools /DI/

- save, import, export files to other formats /DI/

Multimedia in Teaching Foreign Language

The aim of the course is to acquaint students with using multimedia in teaching English as a foreign language. It is an optional course and is for students of the master's degree program. The course is specific for students majoring in teaching English as a foreign language. The content of the course includes:

- pedagogy in new millennium /SD/

- CALL /SD/

- pedagogical theories and CALL /SD/

- internet in English language teaching/ learning /SD/

- blended learning /SD/

- using multimedia in teaching listening skills /SD/

- using multimedia in teaching reading skills /SD/

- using multimedia in teaching speaking skills /SD/

- using multimedia in teaching writing skills /SD/

- using multimedia in teaching grammar /SD/

- using multimedia in teaching vocabulary /SD/

- integrating skills in CALL /SD/

3.6.2 University no. 2

Within the existing study program at this university, the accreditation is now close to expiring. There are three courses related to the development of ICT competence in U2: *Computer Science for EFL Students; Exercise in Didactic Technologies; and Computer Technology for EFL Teachers.* Due to the expiring accreditation, new students are no longer enrolled in the study and only the existing students are completing their studies. New students are enrolled in newly accredited study programs which will be analyzed in detail as well.

Computer Science for EFL Students

Upon completing the course, students will be aware of how ICT tools can facilitate English teaching and learning. Having completed the course, students will be able to: work with various specialized online dictionaries and search the British National Corpus, create their own files with pictures, comics, online postcards, put their files in the class Wiki as well as create their own online presentations. After the introductory class, the course is characterized by self-study, students do the course with the support of LMS Unifor and present their results in the class Wiki.

The content of the course includes:

- acquaintance with the Internet, the most suitable ways of searching in the network, a list of sites that will help students study English /SD/

- work with on-line dictionaries - explanatory, translation, special picture dictionaries, dictionaries of synonyms, etymological dictionaries, etc. /SD/

- British National Corpus, work with programs designed for searching for common word combinations (collocations) /SD/

- online presentation - suitable tools for presenting your own presentation in English / SD /

- working with pictures, creating pictures from the text, creating small stories in the form of comics, online postcards /SD/

- basics of creating interactive exercises for learning vocabulary /SD/

- work with wiki for putting links and files on the network /DI/

- Ergonomic principles in working with modern didactic technology /DI/

Exercise in Didactic Technologies

After completing the course, students should be able to: describe and characterize didactic aspects of selected technical teaching systems, computer systems, information and communication technology, media and multimedia; search for commercial and freeware applications for educational purposes; use educational portals and educational social networks; control and perform basic maintenance of selected technical teaching aids; use interactive whiteboards and tablets in teaching; prepare presentation of unprojected recording (recording area), presentation for interactive whiteboard; projection technology, sound (hearing) technology and television technology; choose suitable technology in teaching according to the forms and methods of teaching; prepare materials for presentations of static and dynamic projections; prepare a teaching unit supported by computers, the Internet, static and dynamic projection.

The content of the course includes:

- means of modern didactic technology, their principles, operation and basic maintenance /DI/

- commercial and freeware applications for educational purposes /DI/

- educational portals, educational social networks /DI/

- didactic aspects of selected technical teaching systems, computer systems, information and communication technology, media and multimedia /DI/

- principles, operation and basic maintenance of selected technical teaching aids /UI/

- basic user skills with modern didactic technology, interactive whiteboards in teaching /DI/

- tablets in education /DI/

- preparation of materials and creation of presentations for static and dynamic projection, educational presentations /DI/

- Ergonomic principles when working with modern didactic technology /DI/

Computer Technology for EFL Teachers

After completing the course, students will be able to: work with online dictionaries and portals for teachers; create their own interactive exercises for students; create their own blog; create their own online and offline teaching presentations; create teaching materials with pictures and other graphic elements, use the theory from the study materials designed for ICT4ELT in practice. In the course, the seminars include both theory and practice, teacher's lectures with presentations, discussions on the use of individual programs, tutorials. The content of the course includes:

- study of methods on the integration of ICT in English teaching /SD/

- introduction to sites and portals for EFL teachers /SD/

- work with online dictionaries and portals for teachers, websites with video and audio materials for EFL teachers /SD/

- creating one's own offline and online tutorials /SD/

- creating one's own teaching materials with pictures and graphic elements /SD/

- creating one's own wiki and blogs /SD/

- work with Edmod, creating exercises and quizzes in this program /SD/

- creating one's own interactive exercises and quizzes /SD/

- creating questionnaires for research, etc. /SD/

Within the newly accredited study programs at U2 university, there are 3 courses: *Exercise in Didactic Technology, Computing for English Learners, Computer Technology for English Foreign Language Teacher.*

Exercise in Didactic Technology

The course aims to acquaint students with didactic technology. The course is a compulsory one and is for students of the bachelor's degree program. The course is not specific for students majoring in English foreign language. The content of the course includes:

- modern didactic technologies, their operation, and basic maintenance /DI/

- commercial and freeware applications for educational purposes /DI/

- educational portals /DI/

- educational social network /DI/

- didactic aspects of selected technical educational systems /DI/

- computer systems, information and communication technology, media and multimedia /UI/

- interactive whiteboard in education /DI/

- tablets in education /DI/

- creating presentation for static and dynamic projection /UI/

Computing for English Learners

After completing the course, participants will be able to do the following:

- work with online dictionaries and search the British National Corpus /SD/

- create custom files to work with pictures, comics, online postcards, etc. /SD/

- create their own ppt and other presentations for studies and lectures /SD/

- place their files and links on the group/student wiki /SD/

- create their own online presentations, use free hosting and domains for presentations and studies /SD/

Computer Technology for English Foreign Language Teacher

The course is a required optional course and is for students of the master's degree program. The course is specific for students majoring in English foreign language. After completing the course, students will be able to:

- work with online documents for English teachers /SD/

- create interactive exercises for students /SD/

- create blogs to support English foreign language teaching /SD/

- create online and offline tutorials/SD/

- create learning materials with pictures and graphics /SD/

- create files with images, comics, online postcards, etc /SD/

- create wiki classroom /SD/

- create an online presentation, use free hosting and domains for teaching English /SD/.

3.6.3 University no. 3

Examining the university information system available for the public, which contains the study agenda, including syllabi, we found out that within the existing study program, whose accreditation is close to expiring, there are 5 courses focusing on ICT: *Applied Informatics I; Information and Communication Technology, Informatics and School Administrative; Applied Informatics II; Didactic Technology.*

Applied Informatics I

The aim of the course is to acquaint students with using technology to create computer presentations and educational programs and using blogs to publish articles. The course is a required optional course and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- presentation – text /UI/

- principles of creating computer presentations, text, font, color, effect /UI/

- presentation – graphics /UI/

- graphic objects in presentation, pictures, photographs, diagrams, graphs; types of graphic files, ways of finding pictures, photo gallery on the Internet, digital photography, document scanning /UI/

- presentation - multimedia /UI/

- Inserting audio and video in slides, underpainting, comments on slides, animation /UI/

- blog - appearance, articles, sections /UI/

- blog as a means to publish articles on the Internet, creating a blog, creating columns, sorting articles chronologically and thematically, change of appearance, /UI/

- blog - inserting pictures and links /UI/

- editing images and inserting into a blog, inserting various types of hyperlinks to an article /UI/

- introduction to the dynamic geometry environment /UI/

- the use of dynamic geometry environment (GEONExT type, Cabri Geometry, etc.) /UI/

Information and Communication Technology

The aim of the course is to acquaint students with basic concepts and skills related to using modern information and communication technology. Students will learn basic technical terminology; master basic computer skills; be able to edit text; master typing with ten fingers; be able to correctly cite resources; be able to search for information on the Internet; be able to receive and send e-mails. The course is a required optional one and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- basic concepts of information and communication technology /UI/

  - IT basics; the benefits of using computer for work and its use in practice

  - information technology and society; man versus computer

  - data security; copyright; anti-piracy activities

  - hardware; software; operating system and types of application

  - communication; electronic mails

- using computers and managing files /UI/

  - the use of computers and management of files

  - creation of directory

  - setting user interface

- text editing /UI/

  - font, paragraph, format

  - output options and printing documents

- o citing sources

- o typing on the keyboard

- services of information network /UI/

  - o philosophy of working in network, pros and cons

  - o information sharing and security

  - o the use of e-mails

  - o the Internet and intranet

  - o information retrieval and processing.

Informatics and School Administration

The course focuses on the use of information and communication technology in school administration, including management of registration, printing of school reports, creation of school plans and timetables, and management of electronic books, etc. The course is a required optional one and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- registration and pupil's data /UI/

- creating and editing reports /UI/

- export to PDF, RTF, XLS, XML or HTML documents /UI/

- principles of protecting pupils' personal data, encryption, secure password /UI/

- electronic book and its management /UI/

- web interface of accounting program, security and privacy of web applications /UI/

- the most widespread software packages for school administration and registry /TM/

- trends and innovations in the use of information and communication technology in school administration /TM/.

Applied Informatics II

The course is a follow-up to the subject of Applied Informatics I. The aim of this course is to develop students' ability in using information and communication technology in teaching. The course is a required optional one and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- principles of creating websites /UI/

- using WYSIWYG NVU editor to create HTML documents /UI/

- using PSPad to edit HTML or XHTML /UI/

- CSS and Topstyle Lite editor /UI/

- creating forms and processing script—JavaScript /UI/

- publishing on websites, catalogues /UI/

Didactic Technology

The course focuses on the use of information and communication technology in teaching at lower secondary schools. The course is an optional course and is for students of the master's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- hardware (projector, interactive whiteboard) /DI/

- educational programs /DI/

- free programs and their use in teaching /DI/

- Google application (pages, shared documents, questionnaires) /UI/.

Within the newly accredited study programs at U3 university there are three courses related to the development of ICT competence: *ICT in Education 1, ICT in Education 2, Multimedia in Teaching English*.

ICT in Education 1

The course focuses on a more advanced use of information and communication technology in general and especially on the use of technology in the future teaching profession. The content of the course includes:

- ergonomics and hygiene of computer work /UI/

- information sources in education, university library, the Internet /DI/

- text formatting in a text editor, working with a template /UI/

- work with a spreadsheet editor (creation of graphs, tables, basic calculations) /UI/

- principles of creating electronic presentations /UI/

- HW usable in the work of the teacher - overview, options, parameters /DI/

- SW usable in the teacher's work - overview, options /DI/

- types of licenses, licensing policy /UI/

- possibilities of using the Internet - content sharing /UI/

- possibilities of using the Internet - creation of pages, creation of photo galleries /UI/

- Internet security /UI/

- special software in the education of children and pupils with special educational needs /DI/

ICT in Education 2

The course focuses on a more advanced use of information and communication technology in general and especially on the use of technology in the future teaching profession. The content of the course includes:

- interactive whiteboards, types of whiteboards, principles of work/DI/
- programs for interactive whiteboards /DI/
- creation of materials with interactive whiteboards - basic tools /DI/
- creation of materials with interactive whiteboards - more advanced tools /DI/
- possibilities of using interactive whiteboards in the teaching process /DI/
- tablet types, principles of work /DI/
- possibilities of using tablets in the teaching process /DI/
- BYOD in teaching /DI/
- use of Google Apps in the teaching process /DI/
- blended learning / DI /
- LMS systems - principles of work, basic overview /OT/
- flipped classroom / DI /

Multimedia in Teaching English

The course provides knowledge about the possibilities of using computers, the Internet, tablet, mobile phone and other modern technologies in teaching English. Students work with technology (computers, tablets, interactive whiteboards, etc.) and create their own activities based on the topics discussed. The content of the course includes:

- computer, multimedia, technical possibilities and language teaching /SD/
- language teaching programs, online materials and interesting websites /SD/
- pronunciation and words from the Internet, electronic dictionaries /SD/
- grammar on the Internet, electronic interactive textbooks /SD/

- reading and listening on the Internet, electronic interactive textbooks /SD/

- videos, songs, trailers, podcasts, etc. /SD/

- interactive whiteboards, projector options, supplementary materials to textbooks /SD/

- network communication, formal and informal expressions /SD/

- cooperation and education of teachers on the Internet, cooperation of schools, e-twinning, projects /SD/

- competitions, games, webquest /SD/

- e-learning, LMS, virtual worlds, /OT/

- websites about education, video production /SD/

- presentation of activities, activities on the interactive whiteboard /SD/.

3.6.4 University no. 4

Currently there are two courses related to the development of ICT competence at U4. They are *Information Technology in Education* and *ICT in Teaching*. Previously, there was no course for training ICT competence of future EFL teachers at this university. Therefore, this is a new accreditation.

Information Technology in Education

The goal of the course is to develop students' ability in creating ICT products. The course is compulsory and it is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. Students of other subjects can also attend the course. The content of the course includes:

- categories of ICT, history, current use and continuity of technology and tools /UI/

- computers and tutorials /DI/

- multimedia in education, method of creation and presentation /DI/

- office applications and their use in teaching /DI/

- mobile technology in teaching /DI/

- interactive whiteboards in teaching /DI/

- computer graphics, method of creation, copyright issues /UI/

- the Internet and information sources /SN/

- the use of ICT tools in evaluation /DI/.

ICT in Teaching

The aim of the course is to acquaint students with online applications for learning. Students will learn the use of ICT tools and web application for different forms of teaching, particularly for classroom management; evaluation; publishing; and practical examples of using ICT in teaching. The course is for students of the master's degree program. It is a required optional course. It is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- concept of web 2.0, web applications and the principles of their operation /UI/

- Google applications and their use in schools, sharing of materials, online office packages /DI/

- tools for frontal teaching /DI/

- tools for evaluation - Socrative and Quiz /DI/

- Google form and its educational potential /DI/

- tools for classroom management (google classroom, Edmodo, Apple classroom) /OT/

- kahoot! Didactic use of games /DI/

- publication tools for teachers (Weebly, Webnode, Wix) /DI/

- other tools for teaching (Desmos, Quizlet, Class kick) /DI/.

3.6.5 University no. 5

Having analyzed the information system of this university, we found out that within the existing study programs, whose accreditation is gradually ending, there are 8 courses related to the development of ICT competence: *Processing and Presentation of Electronic Documents; Computer Graphics; Websites Development; Cloud Data Processing; Computer in Education; Use of Mobile Touch Technologies in Teaching; Interactive Technology in Education; Educational Technology in the Work of a Teacher.*

Processing and Presentation of Electronic Documents

The aim of the course is to explain, develop, and consolidate skills in processing text, numerical and graphic information. The dominant environment is related to word processors and spreadsheets. The course is optional and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- characteristics of the electronic text, character string, character format, logical structure of a document /UI/
- creating and editing a text document, character format, paragraph, page, section, document format /UI/
- usage of template, styles, outline, bullets and numbering, basic search and replace, spell checker, header and footer, page numbering /UI/
- integrating objects into text, inserting symbols, text boxes, images, tables, creating graphics /UI/
- processing and sorting in lists and tables /UI/
- structured documents, citation, references, index and lists, conversion /UI/
- export and printing of a document, graphics adjustment (photography) /UI/
- creating and editing presentation documents /UI/
- design, graphics, animation /UI/
- advantages of local and cloud environment /UI/
- work with spreadsheet (basic types of graphics, calculating, function, etc) /UI/.

Computer Graphics

The aim of the course is to develop students' skills in the field of computer graphics, including creating didactic materials and documents, and mastery of graphic programs. The course is optional and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- graphic information on computer (basic principles of computer graphics, bitmap and vector graphics-specifics and areas of application, graphic files, graphic format, compression of graphic data, basic image parameters-resolution, color depth, characteristics of graphic format) /UI/

- working with the bitmap graphic editor (bitmap editing, resizing, resolution and coloring, cropping, removal of surface, basic photo correction, color balance, brightness, contrast and parameters, special effects, format conversion, bulk editing, and bulk conversion) /UI/

- coreldraw - work with vector graphics editor (basics of object creation, object manipulation, object modification and transformation, object shaping, aligning and positioning objects, auxiliary tools, curves and curve editing, filling objects and working with colors, interactive tools, paragraph text, import, symbols and image archives, export, printing) /UI/

- raster procedures in editors (histogram-basic adjustment of parameters, basic image parameters-saturation, brightness, contrast, white balance, noise removal, "sharpness" adjustment, tools to support editing in parts of the image, straighten the image, retouching) /UI/

Websites Development

The aim of the course is to equip students with knowledge and skills in searching for resources in computer network; using the Internet services, including publishing documents on the Internet; making webpages and displaying on portable devices; making www materials valid, accessible and applicable. The course is optional and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- characteristics and methods of development in www environment /UI/
  - technology structure, protocol and service on the web
  - history and development of individual technology
  - W3C standards for web creation, validity, version
- HTML language as basis for creating websites /UI/
  - structure and syntax of HTML 5 code, writing parameters
  - structure of www document
  - formatting the content of webpages - lists, tables
  - inserting multimedia elements into HTML
  - interactive components of HTML language, methods of data transmission
  - multimedia elements of webpages
- design websites /UI/
  - CSS3
  - global style of HTML
  - declaration and use of CSS selectors
  - CSS structure and its use
  - CSS positioning, change of style based on events
  - responsive web design, specifics of portable devices
- browser-based programming /UI/
  - JavaScript as an example of a browser-based language
  - language syntax, methods for writing HTML pages
  - JavaScript object structures, using built-in and own objects
  - looping, conditional and functional instructions, examples of practical application
  - non-intrusive JavaScript, event processing, handler declarations
  - JS libraries, how to use remote interfaces
  - client-based support for local data storage
- server-based programming /UI/
  - principles and special features of server-based programming languages
  - generation of website content by server application
  - server, file data storage options (XML, JSON...)
  - asynchronous data transfer methods (AJAX)
  - RESP basic principle, HTTP retrieval distribution options.

Cloud Data Processing

The aim of the course is to make students understand cloud ecosystem and its services for individuals and schools. The course is optional and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- characteristics of the cloud environment /UI/

  - web browser environment, principles of using cloud information. BYOD.

  - URL. Network service, bookmarks. Streaming, instant communication.

  - account binding, synchronization, security, 2-step authentication

  - account settings, browser extensions, OS network, secure logout

  - cloud access (windows, chrome OS, Chromium, Android, ios)

- orientation in cloud services /UI/

  - principle of cloud storage, connection with application, quota

  - means of network communication (mail, chat, social networks)

  - means of working in network (office formats, graphics and media editors)

  - means of network collaboration (sharing, comments, revisions, editing, suggestions)

  - work on cloud projects (form, maps, web gallery, screencast)

  - publishing cloud data

- selecting cloud environment /UI/

  - google Apps for education

  - electronic support-link of web resources, google drive, and google classroom.

Computer in Education

The elective subject Computer in Education is intended for students of the subsequent master's degree in teacher education who have acquired computer skills and already have basic knowledge of the methodology of using ICT — i.e., they have completed the course ON2319V01 Educational Technology in Teacher Work (or are studying parallel) or have completed other equivalent training (e.g., abroad). The main goal is to acquire more knowledge on the use of technology in the classroom, discuss current topics and learn about the most important (typically cloud-based) online applications that are relevant for teachers in workshops.

The content of the course includes the following:

- current developments in educational technology /DI/

- the role of educational technologies /DI/

- transformations of educational technology applications /DI/

- the use of technology in formal learning environments /DI/

- the use of technology in non-formal learning environments /DI/

- the use of technology in informal learning environments /DI/

- educational technology perspectives /DI/

Use of Mobile Touch Technologies in Teaching

The course Mobile Technology in Education is an elective subject designed for postgraduate master's students who have basic computer skills. The course focuses on the didactical peculiarities and possibilities of using certain types of technical tools, which are referred to as mobile touch technologies or tablets. Its task is to allow the students to acquire relevant knowledge and skills that they can then implement when teaching together with the didactics they have already acquired for their respective disciplines. The aim of the course is to familiarize the students with contemporary mobile touch technologies used in education, with their basic technological properties, their educational potential, the possibilities of their functional implementation and using these possibilities in education. The course focuses on the basic terminological constructs of the subject, parameters and didactical features of selected tablets and other

mobile touch technologies, as well as the implementation of didactical materials. Students are introduced to the possibilities of incorporating robotic toys and other didactical techniques to develop information literacy and algorithmic thinking.

The content of the course includes:

- technical tools in training /DI/

  o basic terminological constructs of the subject area, didactical tools, teaching aids, digital learning objects, technical teaching aids

  o current trends and developments in mobile touch technology

- special didactical features of mobile touch technologies /DI/

  o tablets

  o other mobile touch technologies

  o didactical materials for mobile touch devices

  o basic criteria for the evaluation of didactical materials

- touch devices and using them in the classroom /DI/

  o tablets and phones, types, applications, software support

  o principles for working in the classroom (1:1)

  o working with apps and working productively with mobile devices

- basics of algorithmic thinking with students, development of information competency /DI/

  o the role of algorithmic thinking and the development of informational thinking

  o examples of robotic toys in developing algorithmic thinking with school children

Interactive Technology in Education

The course focuses on the didactical specifics and possibilities of using certain types of didactical tools labelled as didactical technology or technical teaching aids. Its task is to allow the students to acquire relevant knowledge and skills that they can then implement when teaching together with the didactics they have already acquired for their respective disciplines. The aim of the course is to familiarize students with contemporary technical tools used in education or with their complexities, especially interactiveness with their basic technological characteristics, educational potential, ways of implementing their features and use to familiarize them with the given possibilities in education. The course focuses on the basic terminological constructs of didactical tools, the creation and implementation of didactical materials, teaching aids, digital learning objects, didactical aspects and features of technical teaching aids and the understanding of the parameters and didactical characteristics of selected contemporary technical teaching aids. The most important areas that are considered here are projection technology and presentation systems and interactive technology or interactive whiteboards. At the same time, the course aims to show students the need to develop information literacy with primary and secondary school children.

The content of the course includes:

- Technical tools in education, basic terminological constructs of the subject /DI/

- Didactical aspects and features of technical teaching aids /DI/

- Special didactical features of the technical tools in the classroom /DI/

- Interactive technology /DI/

- Means of providing feedback /DI/

- Learning environment, didactical materials and ways of creating them /DI/

- Interactive whiteboards, possible uses, software support /DI/

- Principles and working methods with interactive whiteboards /DI/

- Creating learning objects for presentation on an interactive whiteboard /DI/

Educational Technology in the Work of a Teacher

The mission of the course Educational Technology for Teachers is to familiarize students with the possibilities of using information and communication technologies (ICT) in teaching and learning, with a special focus on mobile technologies and the use of freely available teaching materials, open teaching methods and social networks. The main goal is to contribute to the knowledge and understanding of the current potential of ICT to significantly influence educational goals and to revolutionize formal and informal learning practices. Classes are conducted in the form of hangout broadcasts and recorded lectures with video demonstrations (see https://www.youtube.com/user/ Spomocnik). The participants are expected to actively participate in the discussion of the summarized topics, not only during the actual face-to-face session, but also online within the participants' personal learning environment. Depending on the actual features of one's own devices that are connected to the Internet (not a requirement for participation), practical demonstrations for the possible use of these technologies in teaching are offered during the lectures (e.g., so-called feedback channel, where the students can respond immediately in real-time). These are practices that contribute to the educational goals of building the digital literacy of the Internet generation, to which our students clearly belong. Today, all teachers have to master these kinds of activities. Through ICT, university graduates will be much better prepared in continuously developing their teaching methods regardless of the subjects they are teaching. Participating also helps develop students' personal learning environment and kick-start their lifelong learning goals as teachers later. More details can be found here: http://spomocnik.rvp.cz/clanek/17233/.

The content of the course includes:

1. Current developments in educational technology /DI/

- Development of the technical properties of computers and their impact on education, current possibilities for the use of artificial intelligence, education in a globally networked world

2. The role of educational technology /DI/

- Use of technology as an innovation process at teacher, school and state level

- 3 levels of influence by technology on the educational process in practice

- Extended model of functional literacy, competencies, standards for students and teachers, verification of the achievement of the standards

- The TPCK model and implementing it in practice

3. Transformations of educational technology applications /DI/

- From Web 1.0 to Web 2.0 (differences between Web 1.0 and 2.0, practical examples, blogs, podcasts, video conferences, webinars, multi-user environments, educational games)

- Network generation (properties, effects on teaching methods)

- Technological context of various psycho-didactical concepts

- Connectivism and personal learning environments

- Education in the clouds, the impact of 1:1 devices on school practice

- Changes in the learning environment (formal, non-formal, informal)

4. The use of technology in formal learning environments /DI/

- Instructive and constructive approach based on Papert

- Current developments in learning management systems

- E-Learning as a tool for blended learning

- Learning objects (DUM, repositories)

- The inverted class method and its application

- Webquest (primary learning resources)

- The application of educational computer games

- Project-based learning (digital storytelling)

- Examples of successful projects (eTwinning, eLearning Awards)

5. The use of technology in non-formal learning environments /DI/

- E-Learning in virtual learning environments

- Sharing, remixing and legal context (Creative Commons)

- The development of freely available software into freely available learning resources

- Freely available existing tutorials, Open University

- Analysis of formal and informal learning outcomes (badges)

6. The use of technology in informal learning environments /DI/

- Social networks in education (Facebook, Twitter, Google+, etc.)

- Security issues in the online environment

- Achieving learning goals in an informal environment

- From collaboration to cooperation

- Teachers in social network environments (multiple personality, resident/visitor, relationship with students)

- Reviewing one's own digital footprint, conscious development of virtual online presence as a teacher (see credit requirements)

7. Educational technology perspectives /DI/

- Professional assessments for the future

- Technology-induced visions of changes in the school system — improvement, reform, transformation, disruption (visions of selected personalities)

- Ten practical recommendations for the school of the 21st century according to IDEO

- Own assessments for the future

In the newly accredited study programs at the university, the subjects focused on the development of ICT competence are reduced and supplemented by field specific subjects which partially deal with ICT. Overall, there are six subjects directly or partially dealing with the development of ICT competence in future EFL teachers.

Processing and Presentation of Electronic Documents

The aim of the course *Processing and Presentation of Electronic Documents* is to equip students, who are already moderate or intermediate in using computers, with a higher ability to work effectively with information and use basic application programs in their studies at their university. The course is optional and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- personal computer control /UI/

- work in local and remote networks /UI/

- processing text, graphic and numerical data /UI/

- work with a spreadsheet /UI/.

Computer Graphics

The main objective of the course *Computer Graphics* is to develop students' ability in using already acquired knowledge and user skills to work with computer to create their own activity (to say precisely, professional creativity), to create graphically oriented didactic materials and documents. The aim of the course is to acquire relevant knowledge and skills in the field of computer graphics; understand the basic principles and methods of graphic data processing; master the basics of working with graphic data and master various methods of obtaining and editing graphic data, including selecting and controlling programs for working with graphics and knowledge of their specifics and functional possibilities. The content of the course includes:

- basic principles of computer graphics /UI/

- bitmap and vector graphics - specifics and areas of application /UI/

- graphic data compression, basic image parameters (resolution, color depth) /UI/

- graphic formats, work with bitmap graphic editor, work with vector graphic editor /UI/.

Web Sites Development

The aim of the course is to equip students with relevant knowledge and competence in the use of the Internet services, including the skills of publishing documents on the Internet and the basics of creating their own web pages regarding generally applicable criteria for creating valid, accessible and usable web materials. The topic of the course is about the interface of websites and the basic requirements of web design, especially related to the display on portable devices. The course is also supplemented by basic principles and administration of information systems, including working with specific database publishing and editorial systems / UI /. Courses focusing on the development of ICT competence are included in the newly accredited study programs only in the bachelor's study program and they are required optional.

Cyber Security

The aim of the course is to introduce students to cybersecurity, whereby the focus lies on the possibilities of working with students in the classroom. The purpose of the course is to develop students' awareness of the digital footprint and cyberspace in general as a specific environment. The main focus of the course is the definition of basic terms and their specification (e.g., cyberspace, digital footprint, cyberattacks), the risks of working in cyberspace or defence and defence technologies, the digital footprint of the individual and the school (e.g., form of DS, possibilities of DS misuse, administration and control of DS), committees and organizations that deal with cybersecurity, their area of responsibility and work for schools (e.g., NUKIB, Saferinternet), law and the Internet (e.g., data protection, GDPR (general data protection regulation)   issues), security in cyberspace (financial management, electronic communication, social networks) and the credibility of information in cyberspace (fake news). /UI/

Didactics of the English language Ⅲ

The aim of the course is to develop students' ability in teaching English as a foreign language. Students will learn theory of teaching and methods of teaching. The course focuses on students' professional development. Students will develop their knowledge, skills and attitudes through studying literature, peer teaching, and reflection. The course is compulsory and is for students of the master's degree program. The course is specific

for students majoring in teaching English as a foreign language. The main content of the course includes:

- approaches, methods and techniques—terminology and concepts

- major trends in 20th century language teaching and its 21st century reflection in EFL classroom

- major trends in 20th century language teaching—the emergence of methods and their 21st century reflection in EFL classroom

- current approaches and methods

- teaching practices

- alternative 20th century approaches and methods

- using technology in language teaching (ICT in EFL, CALL, Electronic Text, Corpora text) /DI/

- cooperative language learning and multiple intelligence.

Didactics of English language I

The aim of the course is to provide students with the theory of teaching English as a foreign language and a platform for practicing and developing techniques and skills in teaching English as a foreign language. Students will learn contemporary research-based concepts such as language acquisition, linguistics, psycholinguistics, pedagogy, psychology, and teacher education. The course is compulsory and is for students of the master's degree program. The course is specific for students majoring in teaching English as a foreign language. The content of the course includes:

- Seminar 1 - On being a teacher

    o Practical info - syllabus introduction, system of work, requirements

    o Introducing basic concepts, terms and abbreviations (L1, L2, L3; ESL x EFL; ELF; -SLA, FLA, L1A, L2A; SLTE; EFL, TEFL, TESOL; applied linguistics)

    o The roles of the teacher

- o The concept of the good language teacher, effective teacher, expert teacher, confident teacher

  - o Literature for language teachers - teacher training manuals

  - o Teaching and research - academic resources, journals

- Seminar 2 - Introducing classroom observations

  - o Classroom observations - types and purposes

  - o Ways of recording and analyzing observations

  - o Observations and research, classroom research

  - o Introducing micro teaching

  - o Practical: observing and analyzing a part of a video recording of an English lesson

- Seminar 3 - On being a language learner

  - o Learner roles

  - o Learner variables - cognitive, affective, personality

  - o Age in language learning

  - o Teaching young and older teenagers (topics, attitude, motivation, discipline, cooperation)

  - o Teaching adults

- Seminar 4 - On language learning and acquisition

  - o Empiricism and mentalism

  - o Theories of learning and their impact on language learning theories and classroom practice (behaviorist, cognitivist, constructivist, social cognitivist, social constructivist)

  - o Overview of essential SLA (second language acquisition) theories and their implications on language teaching

  - o The learning process - declarative and procedural knowledge, automatization, restructuring, instruction

  - o Learner training

- o Practice: introducing basic language classroom techniques, classroom language

- Seminars 5 & 6- Teaching pronunciation

    - o Teaching segmental and suprasegmental phonetics - techniques and principles, activities

    - o The intelligibility principle

    - o The link between production and perception

    - o Underhill's muscular memory techniques (The Sound Foundations)

    - o Using the IPA (International Phonemic Alphabet)

    - o Literature on and for teaching pronunciation

    - o Pronunciation and the Common European Framework of Reference

- Seminar 7 - The content of language learning, lesson plans

    - o "What is there to learn?" - language forms, skills, functions

    - o Competences - sociolinguistic, systemic and strategic

    - o Needs analysis

    - o Types of syllabi

    - o Lesson plans - types, purposes, examples, mistakes, overplanning, adapting, the "Dogme" approach, planning ahead - planning the course, continuity

    - o Managing multiple classes, keeping organized, keeping on top of the workload, aims and objectives

- Seminar 8 - Classroom management

    - o Classrooms, schools, companies and lessons

    - o Using space /seating/ classroom management

    - o Active classroom techniques

    - o Interaction - lockstep, pair work, groupwork

    - o Lesson - types of lesson, stages of the lesson, ways of varying the lesson

- Seminar 9 - Vocabulary in language teaching

  - Overview of research on vocabulary acquisition, learning and teaching

  - Lexical minimum

  - Techniques for teaching, practicing and recycling

  - Learning strategies for vocabulary

  - Learner dictionaries

  - English vocabulary profile

  - Lexical competence in the Common European Framework of Reference

- Seminar 10 - From the history of LT (language teaching) & ELT (English language teaching)

  - Approach, method and technique

  - Direct and indirect methods

  - Grammar-translation method, Direct method, Audio-lingual method

  - Humanistic approaches

  - Communicative language teaching and its offshoots

  - Task-based learning and teaching

- Seminars 11 & 12 - Tools: textbooks

  - Textbooks as methodology

  - Typology of materials

  - ELT publishers

  - Teaching with textbooks

  - Textbook selection and adaptation

  - Materials development

  - Reviewing textbooks

  - Textbook research

- Seminar 13 - Tools: technology /DI/

  o Blackboard

  o CALL

  o Interactive whiteboards

  o The Internet

  o Applications

  o Tools for teachers

  o Corpora in language teaching

3.6.6 University no. 6

Having analyzed the information system of the university, we found out that within the existing study programs, whose accreditation is gradually ending, there are four courses related to the development of ICT competence: *Information Technology in Teaching; Modern Technology in Education; Video Technologies at Schools; The Use of Information and Communication in Teaching.*

Information Technology in Teaching

The aim of the course is to introduce students to the use of digital technology in the educational field. The course is compulsory and it is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- digital technology and theory of education /DI/

- examples of digital technology in school environment /DI/

- educational application of different digital technologies /DI/

- cloud computing software as a service for educational purposes /DI/

- the Internet and the Internet communication for professional development /DI/

- searching for information and materials on the Internet /SN/

- the use of digital technology in education /DI/

- education portals and communities /DI/

- the use of social networks in education /DI/

- portfolio design /DI/

- cyberbullying /DI/.

Modern Technology in Education

The aim of the course is to make students familiar with modern education in the home country and aboard. The course is required optional and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- the history of educational technology and its development /DI/

- the use of educational technology in supporting communication in educational process /DI/

- modern technology in special education /DI/

- modern technology in lifelong education /DI/

- philosophy, theory, and application of online education /OT/.

Video Technologies at Schools

The aim of the course is to make students understand the use of video technology in teaching. The course is optional and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- video as a supplementary teaching tool, digital film /UI/

- didactic content analysis, creation of scenario /UI/

- using video technology such as camera, DVD to record /UI/

- format and compression, recording /UI/

- projection of video technology, projectors, screens /UI/

- video cameras, rules and techniques of projection /UI/

- program for processing digital videos /UI/

- techniques to make movies more attractive, interval recording, effects /UI/

- camera shooting, synchronization, video studio /UI/

- didactic video, projection /UI/

- digital camera, principle /UI/

- control and setting of cameras, creative programs, menu of the camera /UI/

- composition, exposure, movement, sharpness /UI/

- image format, online editors /UI/

- using photographs to design graphics /UI/

- 3D and photography, video animation /UI/

- using scanners, PCs and cameras to digitalize an image, printing /UI/

- publication of images on the Internet, creation of website with galleries /UI/

- large-screen projection, presentation of works, technical technology /UI/.

The Use of Information and Communication Technology in Teaching

The aim of the course is to develop students' ability in effective integration of ICT in language teaching. It is a required optional course and is for students of the master's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- ICT and principles of foreign language learning /DI/

- principles of effective use of ICT /DI/

- different types of tools and activities /DI/

- creation of materials /DI/

Within the newly accredited study program, 4 courses are offered: *Information Technology in Teaching; Modern Technology in Education; The Use of Information and Communication in Teaching, Didactic and Information Technology A*.

Information Technology in Teaching

The aim of the course is to introduce students to the use of digital technology in education. It is a compulsory course and it is for students of the bachelor's degree program. The content of the course includes:

- digital technology and theory of education /DI/

- examples of digital technology in school environment /DI/

- educational application of different digital technologies /DI/

- cloud computing software as a service for educational purposes /DI/

- the Internet and the Internet communication for professional development /DI/

- searching for information and materials on the Internet /SN/

- the use of digital technology in education /DI/

- education portals and communities /DI/

- the use of social networks in education /DI/

- portfolio design /DI/

- cyberbullying /DI/.

Modern Technology in Education

The aim of the course is to make students familiar with modern education in the home country and aboard. It is a required optional course and it is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- the history of educational technology and its development /DI/

- the use of educational technology in supporting communication in the educational process /DI/

- modern technology in special education /DI/

- modern technology in lifelong education /DI/

- philosophy, theory, and application of online education /OT/.

The Use of Information and Communication Technology in Teaching

The aim of the course is to develop students' ability in effective integration of ICT in language teaching. It is a required optional course and is for students of the master's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- ICT and principles of foreign language learning /DI/

- principles of effective use of ICT /DI/

- different types of tools and activities /DI/

- creation of materials /DI/.

Didactic and Information Technology A

The aim of the course is to make students familiar with the didactic technology and didactic techniques used in the second stage of primary schools and to understand the principles of using modern teaching aids in teaching. The content of the course includes:

- projection, overhead projectors, interactive whiteboards, music sensor board, whiteboards, multimedia TV and touch monitors, tablets in education /DI/

- digital camera, working with the camera, editing digital photography, using photography in creating teaching aids /DI/

- making a computer presentation, principles of making a presentation, work with objects and text, animation /UI/

- video editing, digitization of analog recording, transition effects, sound effects, inserting subtitles (also from external programs), creation of video files and DVD, interactive menu /UI/

- animation, working with a visualizer, scanning the original with a static camera, capturing images with video software, inserting music, subtitles, comments /UI/

- digital camera, creation of a simple script, shooting a scene, production of a didactic film /UI/

- audio and video devices, video recorder control, work with a HI-FI tower, additional dubbing of recordings, DVD recorder options, video digitization /UI/

- scanner, digitization of the original of an image, scanning of transparent objects, OCR (optical character recognition), image editing, use of acquired images /UI/

- digitization of sound, recording from various sources (microphone, tape recorder, CD), signal editing, signal mixing, special sound effects in real time, creation of audio CDs and MP3 /UI/

- voting systems, multimedia textbooks and tutorials /DI/.

3.6.7 University no. 7

There is only one course called "Informatics" related to the development of ICT competence at this university. In the course, students will gain knowledge of Microsoft office, creation of a presentation, free PC software (Linux, Latex, Gimp, Gnuplot, etc). It is a compulsory course and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- test of computer science /UI/

- introduction to information system at university: STAG, Moodle, own cloud, university website /UI/

- Word: editing, text format, reference of literature, footnotes, cross-reference, etc. /UI/

- Powerpoint: inserting pictures, changing fonts and background, students' presentations, etc. /UI/

- Excel: merging cells, changing color and cells, functions, creating graphs, creating macro, etc. /UI/

- free PC software (Linux, Latex, Beamer, Gimp2, Gnuplot, etc) /UI/

A new accreditation has been obtained by the university, but the syllabi have not yet been listed in the information system. The teacher training is still based on the previous accreditation.

3.6.8 University no. 8

Having analyzed the information system of the university, we managed to find out that within the study programs whose accreditation is ending, there are two courses related to the development of ICT competence: *The Use of Technology in Teaching English as a Foreign Language, Topics from Didactics of English: Computer in Language Learning.*

The Use of Technology in Teaching English as a Foreign Language

The aim of this course is to acquaint future teachers of English as a foreign language with some aspects of using technology in ELT. This includes learning how to use mobile devices to create learning activities, how to make them available to students, to use and assess a range of applications and resources currently in existence for language teaching, and also to work with some web-based linguistic tools that serve us in lesson

preparation, in classrooms and in correcting students' work. As quite a few skills are taught during the semester, students are expected to practice between lessons and produce language learning resources. It is a compulsory course and it is for students of the bachelor's degree program. The course is specific for students majoring in teaching English as a foreign language. The content of the course includes:

- using mobile applications that can facilitate the process of storytelling /SD/

- using mobile applications that can facilitate the process of writing /SD/

- using mobile applications that can facilitate the process of speaking /SD/

- using videos in the classroom /SD/

- exploring the possibilities of getting feedback from students through mobile apps /SD/

- project-based learning with technology /SD/

- teaching vocabulary /SD/

- using games to teach English /SD/.

Topics from Didactics of English: Computer in Language Learning

This is an online course. Information is delivered via Moodle and a website where learners have the chance to practically apply what they have learnt. It is a required optional course and is for students of the master's degree program. The course is specific for students majoring in teaching English as a foreign language.

Within the newly accredited study programs, there is only one course, which focuses on the use of ICT. The course is *Use of Technologies in Teaching English as a Foreign Language*. The content of the course is presented below.

Use of Technologies in Teaching English as a Foreign Language

The aim of this course is to acquaint future teachers of English with some aspects of using technology in ELT. This includes learning how to use mobile devices to create learning activities, how to make them available to students, to use and assess a range of applications and resources currently in existence for language teaching, and also to

work with some web-based linguistic tools that serve us in lesson preparation, in the classroom and in correcting students' work. As quite a few skills are taught during the semester, students are expected to practice between lessons and produce language learning resources.

The content of the course includes:

- using mobile applications that can facilitate the process of storytelling /SD/
- using mobile applications that can facilitate the process of writing /SD/
- using mobile applications that can facilitate the process of speaking /SD/
- using videos in the classroom /SD/
- exploring the possibilities of getting feedback from students through mobile apps /SD/
- project-based learning with technology /SD/
- teaching vocabulary /SD/
- using games to teach English /SD/.

3.6.9 University no. 9

At this university, no subject focused on ICT has been included in the previously accredited study programs. As a part of the newly accredited study programs, one course entitled *Information Technology in English Language Teaching* has been prepared for students of the master's study program. This course is specifically designed for future EFL teachers but it is a compulsory optional course.

Information Technology in English Language Teaching

This course focuses on the issue of integrating ICT into English foreign language teaching not only from the perspective of the teaching itself, but also from other aspects of school life (e.g. integrating ICT into the communication with parents). The aim of this course is to acquaint students with a brief overview of the historical development of ICT integration so as to familiarize them with the current concept of integration. The emphasis is placed on the possibilities of didactic use of ICT in English language teaching. Students should not only be able to critically evaluate the possibilities of using

the so-called modern didactic resources in teaching, but also have knowledge and skills of meaningful use of these resources in foreign language teaching.

The content of the course includes:

- integration of ICT into education, legal and ethical issues related to the use of ICT in English language teaching /DI/
- English Me - introduction, interface for teachers, vocabulary, grammar, listening comprehension, listening and translation training, English Me and autonomous learning, comparison with other products /DI/
- hot Potatoes - introduction, characteristics of modules, JMatch, JMix, JCross, JClose, JQuiz /DI/
- Kahoot, Quizlet, escape games, instructional videos /DI/
- MS Teams, Zoom, Google Meet /DI/
- mini-projects I and II - functional use of language (spoken and written discourse) in the context of the current epidemic situation /DI/.

3.6.10 University no. 10

Having analyzed the information system of the university, we managed to find out that within the previously accredited study programs, there are four courses related to the development of ICT competence. Three of them are for students of the bachelor's degree program: *Processing Electronic Documents; Multimedia in Schools; Methods of Searching and Obtaining Information* and one of them is for students of the master's degree program: *Digital Technology in Teaching.*

Processing Electronic Documents

The aim of this course is to develop students' knowledge and skills in preparing electronic documents, especially for writing theses. Students will become acquainted with processing documents, standards of editing documents, typographic rules, citing literature, and the law of copyright. It is a compulsory course and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- rules of formatting in a text editor /UI/

- document processing (styles, inserting pictures and tables) /UI/

- cross-references in a document, rules of typography /UI/

- citation of bibliography /UI/

- graphics and presentation /UI/

- spreadsheet (tables, functions and graphs, sorting) /UI/

- library database, copyright, Google services /UI/.

Digital Technology in Teaching

The aim of the course is to acquaint students with the selected digital technology and its use in teaching. It is a required optional course and is for students of the master's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- modern didactic technology /DI/

- rules of making educational presentations and their resources /DI/

- non-traditional tools for making presentations /DI/

- interactive systems /DI/

- response systems and creating questions /DI/

- online tools for creating activities /DI/

- tablets in classrooms /DI/.

Multimedia in Schools

The course aims to acquaint students with the implementation of multimedia in schools, particularly to acquaint them with processing audio files, animation techniques and video arts. Students will learn how to use multimedia in education. It is an optional course and is for students of the master's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course

includes:

- methods of proceeding projects /UI/

- introduction to processing audio programs. e.g. Audacity /UI/

- introduction to multimedia applications for the creation of animation /UI/

- video arts and their use in ICT, VV or media education /UI/

- multimedia SCRATCH programming for children /DI/

- demonstration of concrete procedures for creating animated projects /UI/

- narration of digital stories and its pedagogical contribution /DI/.

Methods of Searching and Obtaining Information

The course aims to acquaint students with the educational tool—Moodle. The course also provides students with knowledge about services of libraries and electronic information resources (databases). It is an optional course and is for students of the master's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- the important of information in higher education /SN/

- electronic learning environment—Moodle /OT/

- problems of collecting and searching information /SN/

- information sources /SN/

- database system /SN/

- Internet browser /SN/

- the law of copyright /SN/

Within the newly accredited study program, there are 3 courses focusing on ICT: *Electronic Document Processing; Multimedia in School Projects and Digital Technology in Teaching.*

Electronic Document Processing

The aim of the course is to deepen students' knowledge and foster their skills in the preparation of electronic documents, especially for writing theses. Students will gain knowledge of processing large documents, including the rules of editing documents, typographic rules and the rules of citing literature. Students will apply the basic typographic rules of making presentations in preparing their own presentations. Moreover, they will get acquainted with moral issues and the law of copyright when working with the Internet. The content of the course includes:

- rules of formatting in a text editor /UI/

- processing a large document (styles, inserting images and tables, generating lists) /UI/

- use of cross-references in the document, typographic rules /UI/

- bibliographic citations (citation rules, citation methods) /UI/

- graphics and presentation (rules of creating presentations) /UI/

- spreadsheet (basics of working with tables, basic functions and graphs, sorting, predefined lists, checking input data, using the lock) /UI/

- library databases, security, data backup, the law of copyright, file manager, Google services /UI/.

Multimedia in School Projects

Students will get acquainted with the possibilities of processing school multimedia projects in selected non-commercial programs. Specifically, they will get acquainted with the possibilities of processing audio files, animation techniques and the techniques of artistic video processing - the so-called video art. They will also learn the ways of using multimedia in teaching. The content of the course includes:

- methodological background - how to proceed in the project preparation / DI /

- acquaintance with suitable non-commercial programs for audio processing – e. g. Audacity /DI/

- introduction to the principles of animation and suitable multimedia

applications for creating animations /DI/

- video art techniques and possibilities of implementing them in teaching ICT, R&D (research and development) system or media education /DI/

- simple children's programming environment for working with multimedia SCRATCH – the program is operated as easily as the cubes of the LEGO kit are put together /DI/

- examples of specific procedures for interactively creating an animated project /DI/

- digital storytelling and its pedagogical contribution /DI/.

Digital Technology in Teaching

Students will get acquainted with selected digital technologies and their possible use in teaching. The content of the course includes:

- modern didactic technology (characteristics, specifics) /DI/

- the rules of making an educational presentation and its resources /DI/

- non-traditional tools for making presentations /DI/

- interactive systems (characteristics, specifics) /DI/

- basic tricks in interactive SW /DI/

- prepared activities and tools /DI/

- making an interactive presentation and its resources /DI/

- response systems and question creation /DI/

- online tools for creating activities /DI/

- tablets in teaching /DI/.

3.6.11 University no. 11

Within the previously accredited study program there are four courses related to the development of ICT competence at U11: *Information Technology — Test, Graphic Presentation, Work with Interactive Whiteboards, and Technology in Education.*

Information Technology

The course aims to develop students' ability in working with common operating systems. In the course, students will learn basic things about hardware, software, ICT classification and security, the work with text (creation of documents, graphic objects, headlines, styles…) /UI/, work with graphics (vector and raster graphics editor) /UI/, photo editing /UI/. It is a compulsory course and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language.

Graphic Presentation

The course aims to acquaint students with graphic editors, audio and video processing on a computer, and making a presentation. It is an optional course and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- introduction to bitmap graphics, cutouts, transparency /UI/
- vector graphics—objects and their attributes /UI/
- editing objects, shapes, knots /UI/
- editing photos /UI/
- web graphics /UI/
- audio processing /UI/
- video editing, script, subtitling /UI/
- principles of creating presentations, use of graphics in presentations /UI/
- creation of graphs for teaching /UI/.

Work with Interactive Whiteboards

The aim of the course is to acquaint students with the use of the interactive whiteboards as an educational tool in teaching. It is an optional course and is for students of the bachelor's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- Internet application resources /DI/
- text editing—use of pen and eraser /DI/
- creation of line and shape—types of line, color /DI/
- moving and sorting objects /DI/
- size and rotation of objects, object transparency, shading /DI/
- acquisition of multimedia objects /DI/
- inserting graphics, using tables /DI/
- using animation /DI/
- principles of creating educational materials /DI/.

Technology in Education

The aim of the course is to acquaint students with the use of computer technology in teaching and to equip students with skills in creating multimedia and interactive educational materials. It is a compulsory course and is for students of the master's degree program. The course is not specific for students majoring in teaching English as a foreign language. The content of the course includes:

- basic forms of the use of technology in teaching and learning /DI/
- interactive whiteboards, drawing and writing on a whiteboard, setup /DI/
- presentation, portals to support interactive learning /DI/
- creating educational materials in Smart Notebook, importing own multimedia objects /DI/
- tables in education /DI/

- interactive textbooks /DI/

- digital photography, processing and editing /UI/

- bitmap graphics, cutouts /UI/

- editing learning materials in a graphical editor /UI/

- recording with digital cameras, transferring video to PC /UI/

- video editing, subtitles, video export, video formats /UI/.

This university also has a newly accredited study program. However, it is put to practice gradually. Students are first enrolled in the bachelor's study program, and when there are the first graduates, the students will be accepted for the follow-up master's study program. Having analyzed the bachelor's study program, we realized that it does not include any subject focusing on the development of ICT competence. It was not possible to study the syllabi of the master's study program, as the syllabi have not yet been included in the information system.

3.7 Findings from Investigating College and University Teachers

Standardized interviews were conducted based on questions, whose wording and chronology were precisely defined. Alternative answers were also prepared in advance, but the respondents were given enough space to express their views freely, which they were repeatedly asked to do. The following data were obtained in this manner and are presented as they were obtained. They are interpreted further in Section 4.2 and discussed in context.

In view of the results related to the study of curricula of individual courses aimed at the development of ICT competence, we were initially interested in whether the current curricula (syllabi) were sufficient for the development of ICT according the supervisors and experienced staff employed at respective universities.

Strongly agree = 1, Somewhat agree = 2, Neither agree nor disagree = 3, Somewhat disagree = 4, Strongly disagree = 5
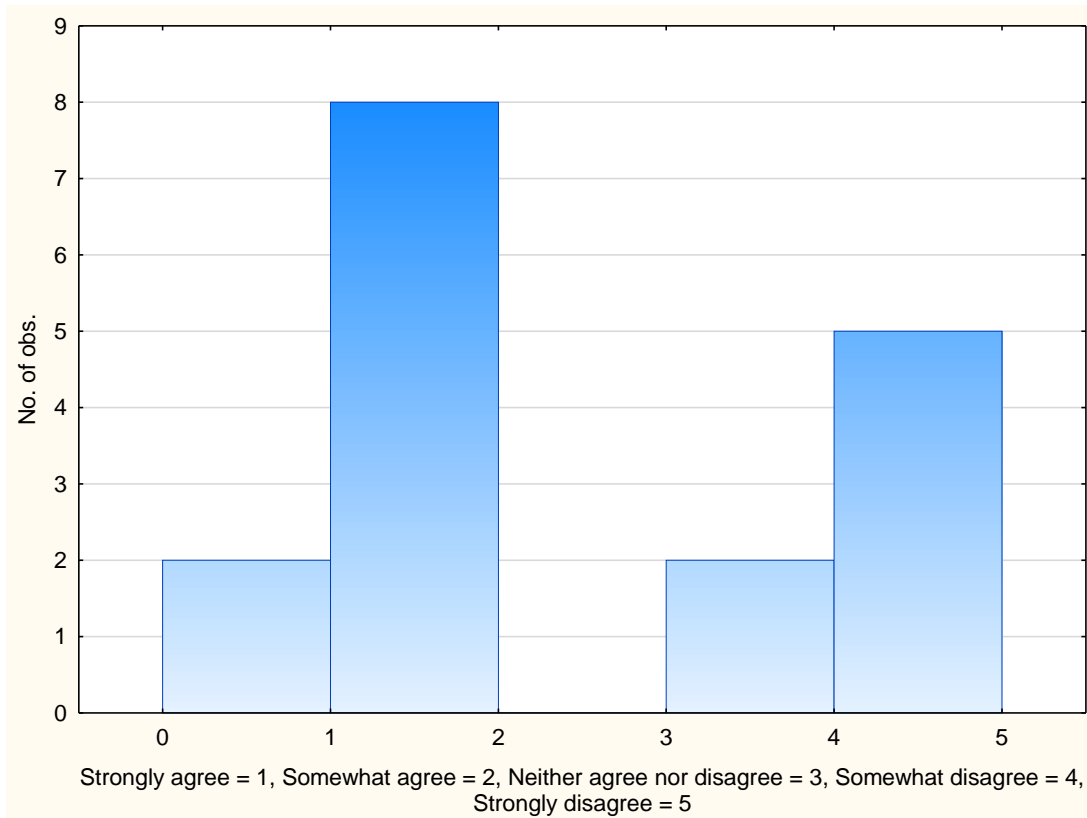
Chart 1: Are current curricula sufficient enough to develop future EFL teachers' ICT competence?

The respondents were asked to give free-form answers, which we have recorded in a table for the sake of clarity.

Respondent number	Free answers of therespondents: current curricula are sufficient enough to develop future EFL teachers' ICT competence
1	I don't think it is sufficient enough right now. But at the same time, we are in the good place. Because there is a change in the system of accreditation programs in the universities in the Czech Repblic. The universities have opportunities to present new programs. If they get the acreditation for the new programs, I think we can apply new approaches and I think ICT should be one of the approaches which should be implemented more. In our curriculum, there are two subjects

	rgarding ICT for future teachers in the five years of study: one is "C" subject during the bachelor study, the other is also "C"subject during the master study.The "C" subjects means they are selective. It means not all the graduates will actually have the knowledge.
2	The current curricula in our university do not incorporate ICT education for student teachers. There are no specific subjects which focus only on information technology. Students as future teachers probably expect to have all skills used later in teaching English language. On the other hand, students give short presentation in the seminars. As a lecturer, I observed some of students are better at working with information technology while some of them are not. ICT ccourse should be incorporated into current curricula in the university.
3	There is just one subject (ICT related subject) for future teachers. There are some general ICT courses for future teachers in the department of technology. But it is not enough. I think they should be incorporated in all the methodological courses in our department.
4	Teachers make their own curricula. If they plan it with lots of ICT ,then there are lots of ICT.
5	I teach two subjects focusing on didactics. That means I give students general framework which does not include the ICT competence development (the two subjects do not include ICT competence development), but I do teach students of primary school level where I focus on methodology and where I include ICT preparation or competence. Although they are computer-literate in their free time, I don't think that they are sufficiently prepared for ICT-use in their future position as teachers of primary school level. That is why I want to include ICT competence in one of the subjects. I have four courses. It is the third of the four. It is in the end of the fourth year of their study. There are two lessons out of the course which are devoted to ICT.

6	I somewhat agree, but I think it can be strengthened somehow, because what we teach is just to implement ICT in teaching. But we don't use the real equipment which is used in the real schools (primary schools). For example, the whiteboard. We have one interactive whiteboard, but it is oldfashion, not the one used in real schools. In my methodological class, I can not prepare that with whiteboards. So I can't prepare future teachers to work with it.
7	I think that current curricula focus on relevant things in terms of ICT in education. It contains a lot of things connected to interactive whiteboards and also lots of things connected to using applications on tablets.
8	I don't know this information.
9	Under current curricula, students know how to prepare presentation. They know the principles and rules of making presentation. They prepare powerpoint presentation. They somewhat develop their ICT competence.
10	Our students, as future teachers, take some ICT courses based on general education. They are taking them in the bachelor's degree programs. In addition, they have translation seminar to develop translation skills. They work with translation programs, using translation software. There are a couple of subjects that we are trying to incorporate in our courses. But most of the courses our students take are not computer-supported. So I somewhat agree.
11	For our department, I would say "somewhat agree".
12	The students can have extra classes with ICT. That is what we call general courses. The future teachers are educated about how to deal with this. When we speak directly about EFL teachers, we have one spectific lecture in which we discuss the issue of how to incorportate ICT into education. We have one practical class in which the learners can see what we can do but offically only those who study English have a very specfic course which is called *ICT in EFL* and these students really work two semesters about how to use ICT in EFL

	education. In the two semesters, there are lectures, practical classes and they also develop courses. They develop different programs for students, so they are very prepared for this.
13	I think our students should work more with computers inside classes to become good teachers and understand ICT competence. They should be involved more into computer technology. I think they should have more classes and lessons where they can develop their own ICT competence and work on the competences in the future.
14	In our university, I strongly disagree.
15	We have just one course related to development of ICT competence. Basically, students are given some instructions of how to use applications and ICT equipment, but we do not prepare our students to generate/create new applications or games. This is what I see as huge weakness.
16	I can use different programs, videos for pronunciation teaching. Now we also have Moodle. We also do that in computer rooms. We are usually encouraged to use ICT.
17	There is just one partial topic in our department, but there may have in other departments.

Table 24: Free answers of the respondents: Current curricula are sufficient enough to develop future EFL teachers' ICT competence.

We were also interested in whether respondents considered the use of ICT in primary schools to be beneficial. The data obtained can be viewed in the following diagrams and the table:
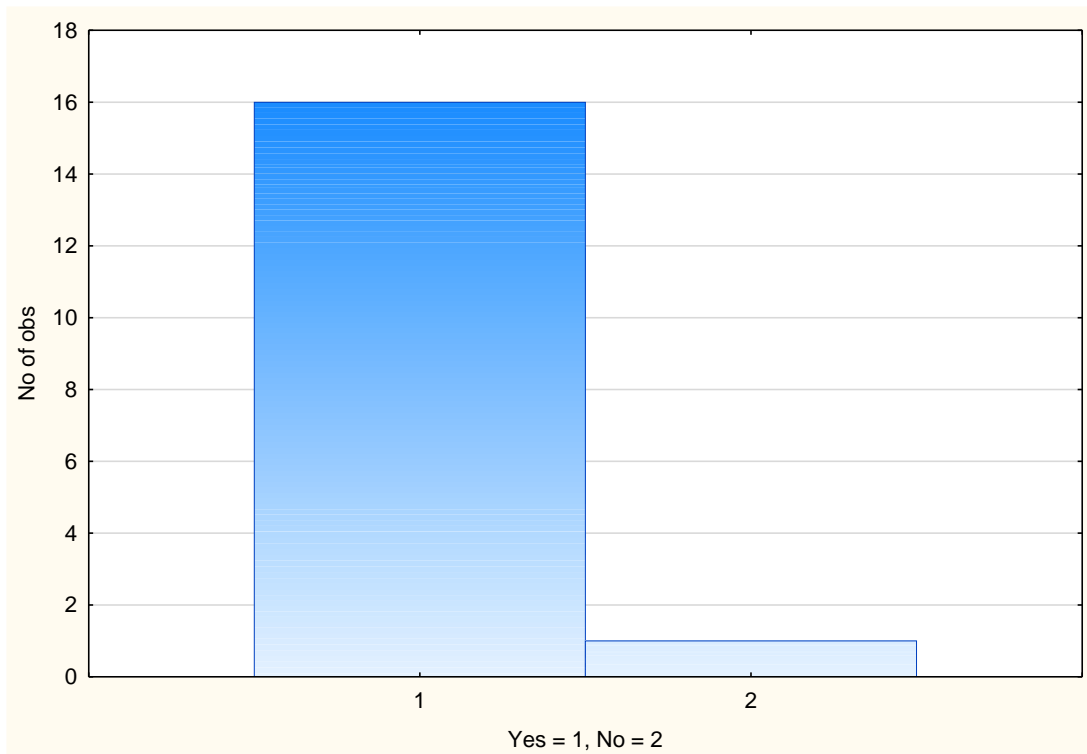
Chart 2: Do you consider using ICT in teaching English as a foreign language an asset (1.–5. grade of the basic schools)?
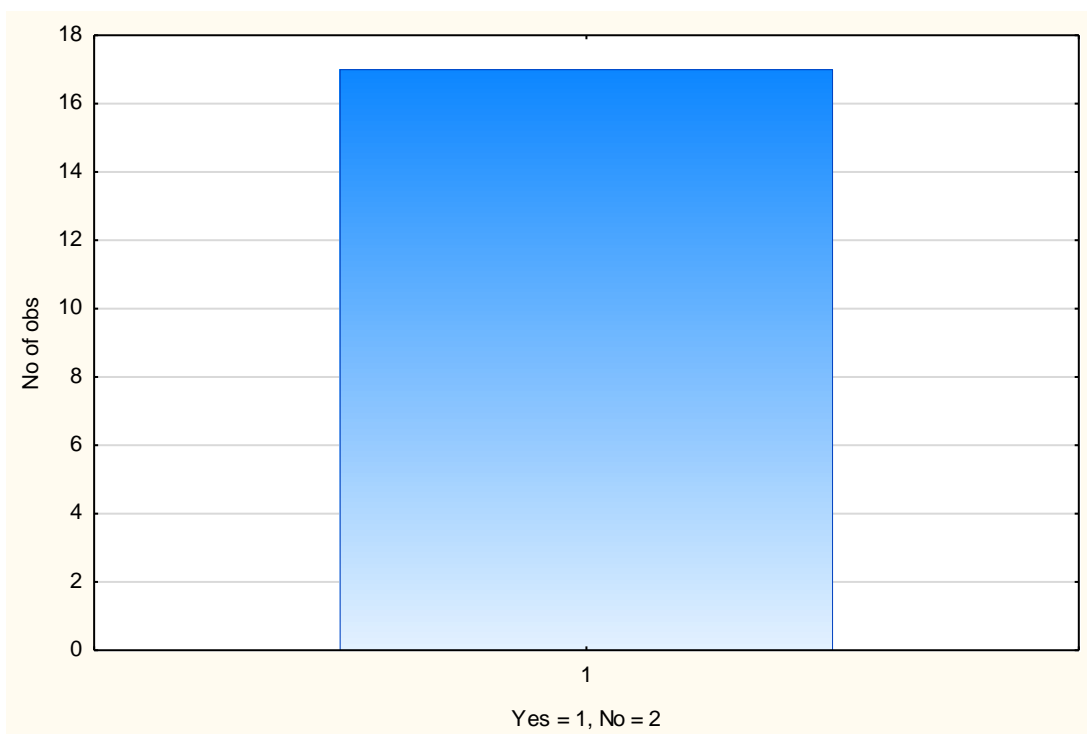
Chart 3: Do you consider using ICT in teaching English as a foreign language an asset (6.-9. grade of the basic schools)?

Free-form answers helped improve our understanding compared to answers obtained by scaling. We have recorded the respondents' answers in the following table:

Respondent number	Free answers of the respondents: Do you consider using ICT in teaching English as a foreign language an asset?
1	For the first grade, I would say neither "yes" nor "no" because I don't have experience of working with small children (1-5 grade). I don't want to say something which is not based on my experience. I worked with the secondary level of children, so I say "yes".
2	I need to point out that teachers need to be very careful about the extent of using ICT in teaching. It is very important in incorporating it. It can be extremely useful. However, teachers need to be very careful about the time which they devote to ICT in the lessons.
3	Definitely yes, there are a lot of research showing that it is an asset when it is used smartly. Not just use it because children like it. It should be used for specific purposes.
4	Yes, for both.
5	For the both, I would say "yes".
6	I think that pupils in the whole primary level and secondary level are well equipped with competence in technology. I think teachers also need to make use of what children know and what they like and to show them how to use the technology for educational purposes, not just for games, not just for fun, not just for videos, but for looking for necessary information, using the information, processing the information. I think this is extremely important. I think English lessons provide great space for connecting. They can use mobile phones for checking words, they can work on projects. In Slovakia, children are forbidden to bring telephones to classrooms. But in English lessons, I would use them and I always say to my students

	(future teachers) that "try to use these things which children like, but teach them how to use them reasonably, how to use them with sense".
7	Students in both levels were born in the era of technology, so they cannot imagine their lives as well as learning without technology - not only learning in general, but also foreign langauge learning. And as they live in a technological world, learning for them is using technology. From this point of view, they use technology everyday not only in free time but also for learning. I would say it is definitely an asset. Also in foreign language teaching, technology makes lessons appealing to students. Probably in the future, the technology will be even more involved in their lives.
8	I would say "yes" for both.
9	Yes , for both. In general, young learners are keen on using ICT, e.g. tablets, smart phones, or computers. They like English, so teachers should somehow put together these two things and use ICT in teaching English.
10	For both grade, it is an asset. But there should be a balance in using ICT.
11	In both cases, I would say " yes".
12	In Slovakia, children are given a lot to work with ICT. Therfore, kids have different programs which are definitely recommended for language acquisition. Now they are skillful in using ICT. On the other hand, they are given different programs definitely prepared for English language enhancement. That is why both of them definitely are useful.
13	For both grades, yes. From my personal experiences, I use computers and commmunication technology for teaching.
14	For both grades, I would say " yes".
15	I think for both grads, it is beneficial.

16	I think ICT is beneficial for both grades.
17	For both grades, I would say " yes".

Table 25: Free answers of the respondents: Do you consider using ICT in teaching English as a foreign language an asset?

The respondents are in close contact with their students—future EFL teachers—and they are aware of their students' levels of competence. Therefore, they were addressed the question "Which ICT competence needs to be improved for future EFL teachers?" The respondents were given the choice of three answers (see the graph below) but could be more specific in discussing their opinions. Only one respondent used this possibility and stated the following: evaluating resources, internet security, critical thinking when using ICT.
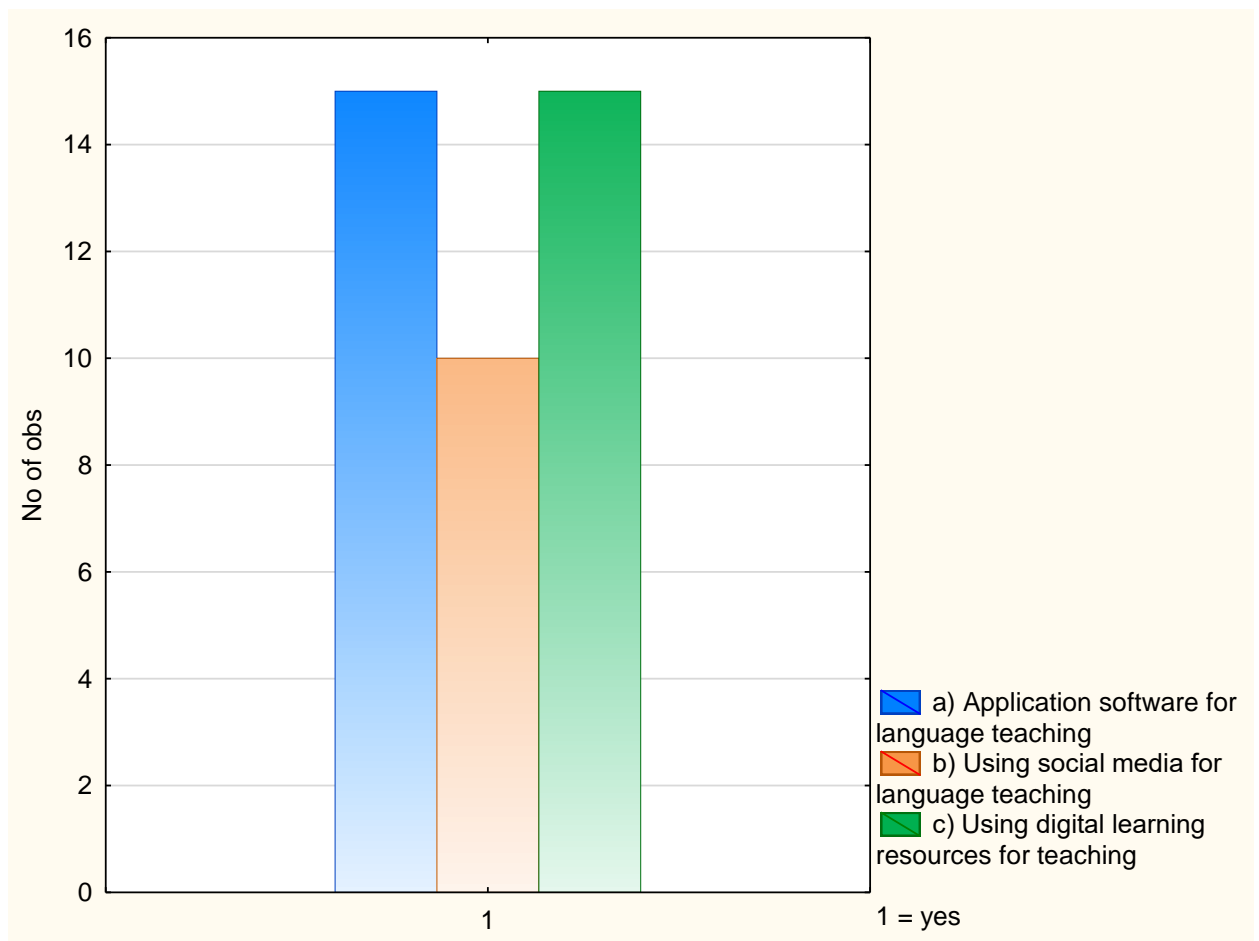
Chart 4: Which ICT competence needs to be improved for future EFL teachers?

During the interview, the respondents were repeatedly encouraged to discuss their answers in detail. Their replies are recorded in the chart below:

Respondent number	Free answers of the respondents: Which ICT competence needs to be improved for future EFL teachers?
1	I think these three are very good. Regarding using application software for language teaching, if it (the competence) needs to be improved, it depends on the curricula or the programs. Regarding using social media for language teaching, I have strong opinions on this one as a teacher as well as educator. Using social media efficiently for language teaching is something that teachers should embrace nowadays. They should learn the way and how to work with social media effectively. From what I have seen in my experience, there are numerous teachers (not only in the Czech Republic, but also in Europe) who would refuse social media. They say it is a bad thing, it is connected to socio-technology, it is bad for people to spend so much time. But that doesn't mean that teachers should refuse it for school activities. I use Facebook, so my students are able to reach me anytime they want by using messenger application on their mobile phones. Regarding using digital learning resources for teaching, this is a digital era, I think we harms students if we refuse to use them now. It is intolerant.
2	Educational software is important for language teaching. Social media is already used in language teaching and it is also important. Digital learning resources are supplement to textbooks. The future teachers need to know how to work with these resources.
3	All of them. Definitely. Maybe not using digital learning resources for teaching because if they are not free, teachers won't want to use them.
4	Yes, but it depends on individual teachers.
5	For digital learning resources, I think it is not necessary. In my opinion, quite often, they are self-instructed.

6	We still stick to what we know such as using presentation. We don't update it. Students teach us how to work with new tools. They show us the effective things that we can use.
7	Technology is updated. In future, as technology will be more involved, we need to keep the teachers to update it. Every time when there is a new thing in education, it should be somehow implemented in the preparation of teachers.
8	I don't choose "social media" because social media sometimes is dangerous.
9	I think teachers need these applications, because teachers don't have much time in searching various sources relevant to the topics they teach. If there are something ready (some applications they can use), it will save their time. That means teachers don't have to sit in front of computers and try to find some software for teaching English.
10	I picked all of them. But considering our students, I think most of them are familiar with social media and digital learning resources. Maybe application software they need to improve more.
11	Actually I don't know much application software. I think the most important thing is to use appropriate materials and resources.
12	In Slovakia, future teachers have to participate not only in observing classes but also in teaching classes. Definitely, they are recommended to use different supplementary materials to let students be exposed to natural English.
13	I would go for all of the three.
14	I think all of them. I think a lot of teachers don't know about software for language teaching. We don't use social media for language teaching, either. I think using digital learning resources for teaching is better, but we still need to improve.
15	We should use digital tools for easier teaching - not only to help learners learn, but also help teachers to teach - because we are overloaded. There

	are many many things that computers can do instead of the teachers, of course, under the control of teachers.
16	I think maybe children are not really aware of the opportunities they have. Teacher can show them. For example, a dictionary, there is a button for pronunciation. And there are digital learning resources for teaching. We have these resources, but teachers don't know how to use them. With social media, I do not choose it because I am not sure that children at this age really should have social media. Maybe they should be told responsibility, but not really to use it as a tool for learning language. For digital learning resources, some teachers just use them in a traditional way. They don't make fully use of them.
17	Competence regarding "using application software for language teaching" is not integrated into our curriculum in our department, apart from the department of technology. I choose "using digital learning resources for learning", because this competence is overlooked by quite a lot of teachers. And students tend to find something online, but they just take it without judging it. I don't choose social media, because this is something that they have already used. They use social media, but they don't acquire language.

Table 26: Free answers of the respondents: Which ICT competence needs to be improved for future EFL teachers?

Implementing innovation is essential, so we asked our respondents whether it was necessary to improve the ICT competence of future EFL teachers during their time at universities. The answers are recorded in the form of the following diagram and the table:
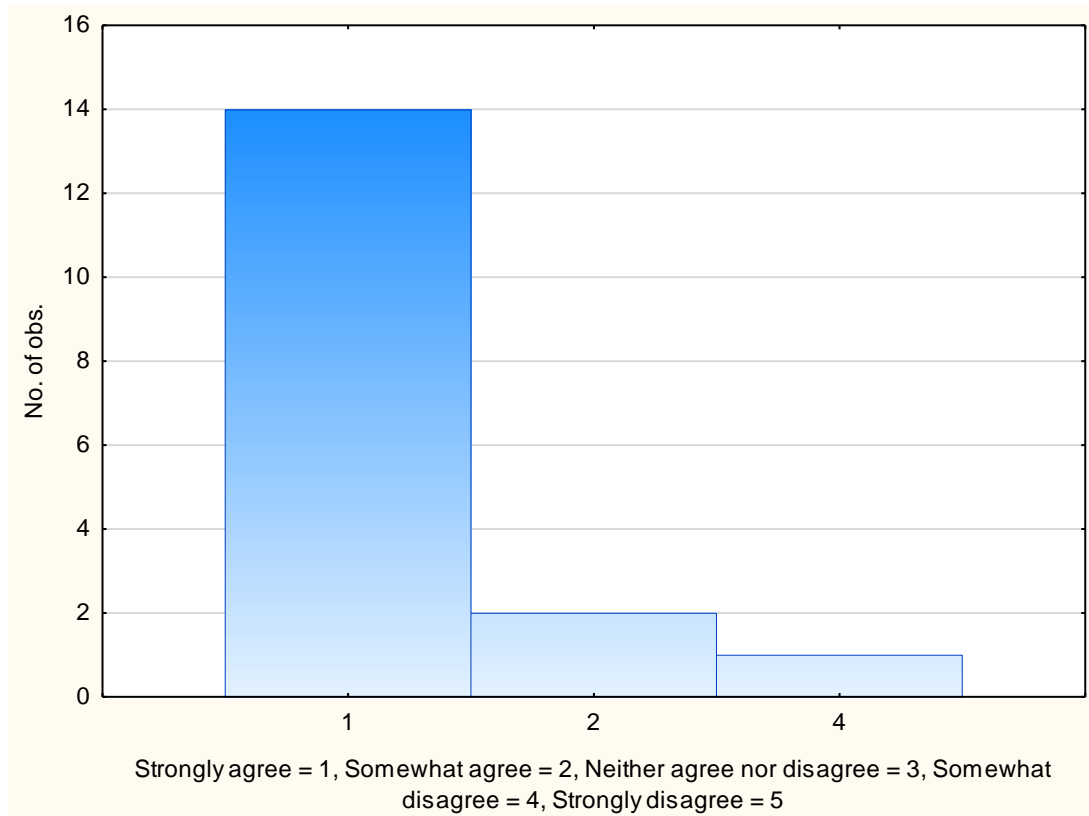
Chart 5: Is there a need to improve future English teachers' ICT competence?

In the table, we again present the respondents' answers:

Respondent number	Free answers of the respondents: There is a need to improve future EFL teachers' ICT competence
1	Definitely. I think I answered that before. I talked about what it is going to happen if we don't accept it because we live in a digital era.
2	In all spheres, basically, how to work with computers, how to prepare presentation, how to use the ICT in lessons.
3	I think there is a need to improve. This question is connected with the first question.

4	There is always a need to improve but they don't need to be ICT specialists. They need to be able to use all kinds of programs, software. There are so much on the Internet. They could be used for teaching.
5	Yes, I strongly agree.
6	We don't update it with what is used in real schools. So I cannot teach them how to work with the whiteboards because I don't know how it works. This is what I think should be done.
7	I have already said previously.
8	I strongly agree.
9	We need ICT in other areas of our lives. Digital /electronic means future of mankind.
10	Our students are very skilled in using ICT. Their competence are quite good.
11	I would say "strongly agree".
12	Difficult to say, because nowadays we have first bachelor teachers (future teachers) who have gone through the programs. We will see next year whether they are well prepared or they still need.
13	I would say "strongly agree".
14	There are a lot of teachers, particularly in the middle age,who do not know how to use ICT in teaching English.
15	Defnitely, I strongly agree.
16	The development is so fast now. All the time teachers need to be trained and developed and show different things. There is space for teachers to be trained constantly.
17	I strongly agree.

Table 27: Free answers of the respondents: There is a need to improve future English teachers' ICT competence

It is clear that the development of ICT competence is included in the professional training of future EFL teachers. In this context, we ask what the goal of this development is.

Respondent number	Free answers of the respondents: What are the goals of developing ICT competence in the professional preparation of future EFL teachers?
1	Teachers are able to use different media in teaching process actively. I think it is not happening. Only a few teachers can operate and use more media. I think it does with basic computer skills.
2	To develop competence of teachers. They already have some knowledge. Students have some basic knowledge, but when it comes to practice, maybe they start learning. They should know how to use the technology to make lessons interesting for students, to get students involved in the lessons.
3	Using ICT wisely. Teachers should know the aims and benefits. That is why to use it, what they want to reach with it. For example, when I use videos from YouTube, I will think about why it is better than poster, because sometimes poster is better. In some primary schools, they have classrooms and there are posters.
4	To be able to access information, to be able to find, to use websites, to operate (computer devices), to use mobile phones for several activities.
5	To make students use the tools effectively. Sometimes students come to classrooms and they open YouTube and the Internet. In my opinion, this is not effective use. They should prepare for that as well as for any part of lessons. They should have an idea of what they want to follow, what they want to read by using the Internet.

6	The goal is to use technologies as the direction towards knowledge gathering, information processing. To use them as a source and to teach the students (future teachers) how it can be used as a help in teaching, not using technology per se as a goal (for example, my goal is to use the Internet, my goal is to use interactive whiteboards), this is the means of getting some information, processing information, but to teach students how to work with it reasonably, how to find information and where to find it, how to evaluate it, whether this information is correct or whether it is offensive.
7	My primary goal is to show the students how to use ICT in the language classroom in a meaningful way because everyone can turn on the projectors or interactive whiteboards.
8	The general aim is to teach students to be able to work with the programs (computers).
9	To be familiar with the webpages relevant to the topics taught; to be able to prepare presentations, use Excel...(Teachers should be wiser than their future learners); to be able to successfully/ effectively act in the digital era in general.
10	Using ICT in preparing their future classes, checking and evaluating their students, (I talked to some teachers, the evaluation is electronic.) to enhance classroom preparation by some application software.
11	Students should be able to use ICTs in the context of language pedagogy, be able to use skills and principles of ICT in practical teaching.
12	To teach future teachers how to use ICT effectively.
13	To show students in the universities how ICT competence is relevant and useful for teaching of EFL, basically, to teach them how they can incorporate computer technologies in classes and benefit from it.

14	We live in the digital age. We need to make use of technology available to us and rely on various resources (not just textbooks) for the safe of variety of matreials used in our lessons.
15	I think English teachers do not prepare students for tests and exams. We prepare our students for future lives. And digital competence is an integral part of our future lives. That is why we need to connect language and digital competence. We should not just use textbooks, because they are artificial. We need to show future teachers how to use digital tools to make English more alive because English is a part of our lives.
16	They (future teachers) should know how to use it for the benefits of the students. They should be able to select the best tools for appropriate situations.
17	To have competence of using existing software and computer-based materials with high efficiency.

Table 28: What are the goals of developing ICT competence in the professional preparation of future EFL teachers?

We encouraged the respondents to evaluate the level of competence of future EFL teachers related to ICT. In the free answers, we also focused on those future EFL teachers who already teach at schools.

Strongly agree = 1, Somewhat agree = 2, Neither agree nor disagree = 3, Somewhat disagree = 4, Strongly disagree = 5
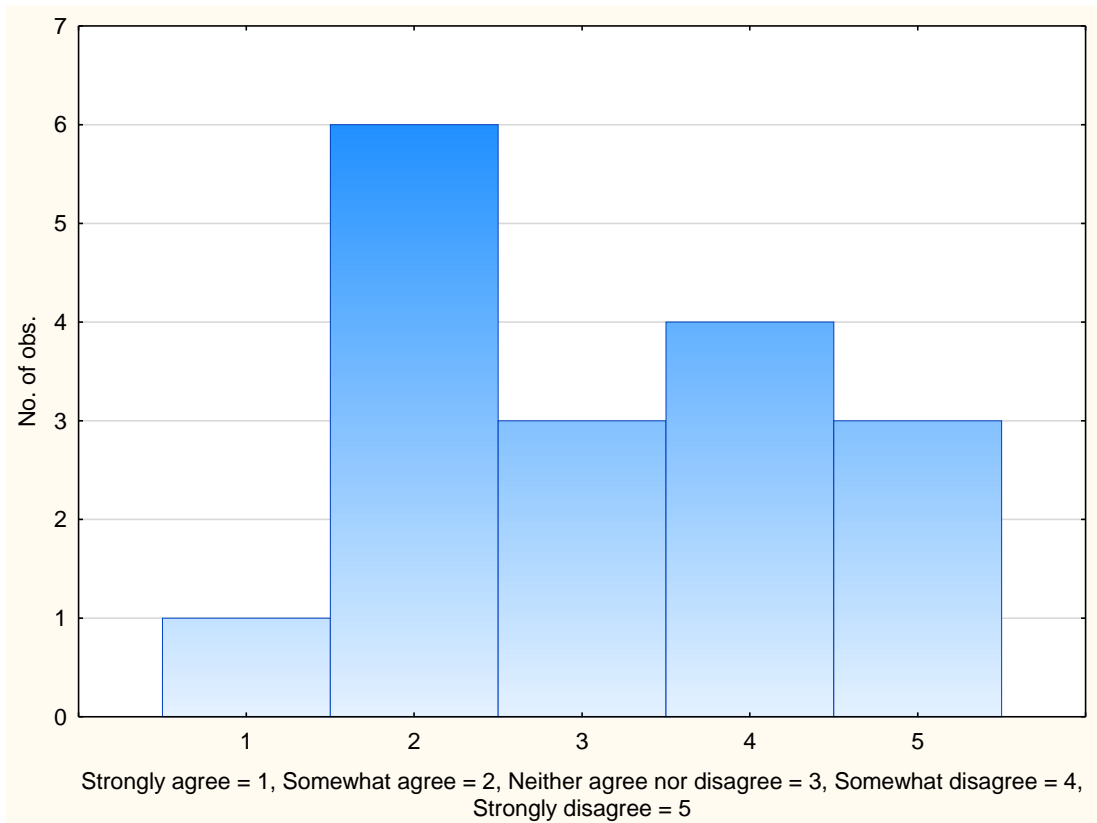
Chart 6: Future EFL teachers' ICT competence is sufficiently developed for teaching English as a foreign language.

Respondent number	Free answers of the respondents: Future EFL teachers' ICT competence is sufficiently developed for teaching English as a foreign language
1	I don't think that future English teachers' ICT competence is sufficiently developed.
2	They can apply ICT in preparing short videos for students or in warming students, but it is not sufficiently developed
3	There are a lot of online tools, but students don't know how to use them.
4	We don't have the equipment such as interactive whiteboards which are used in real schools. It is difficult for us to prepare future teachers.

5	Yes, I think in our courses they are sufficiently developed.
6	They (the generation) know technology more than us. But they don't know how to use it properly in teaching. For example, if we discuss how to use videos in the classrooms. They will tell you "oh, I will play films to my students." They have no goals. They have no language objectives in watching videos. There is no purpose in watching videos. Students can watch videos at home. They (future teachers) should know how to use videos in English lessons so that students can learn something. They should know how to look for other objectives, language objectives, maybe content objectives, not just their students like watching videos so they will play videos.
7	I think what we have here in the department should be developed. It (the existing course in my department) is to teach students how to use interactive whiteboards. There is no specific course where students would be told how to operate all the devices (not only interactive witeboards). I think from the point of view- materials, media, applications, social networks. What I lack here is a course focusing on technical skills.
8	You can always improve it.
9	Our students of English have some courses on ICT. They are able to prepare presentation. They can work with webpages. They can browse the Internet. When they want more knowledge, they can have another course on ICT at the faculty if they wish, because we have a ICT department in our university, but the course is not compulsory.
10	I think it is developed in current generation sudents.
11	I would say "somewhat agree".
12	In our country, we have new generation of teachers. Most of them are skillfull in using ICT. Most schools are supported by the government. Two or three years ago, a lot of computer laboratories were built. That is why nowadays English can be taught in the computer lab and teachers are often given a lot of different programs. On the other hand, students are given tablets. I think nowadays it is highly supported. If you speak about English

	teachers. Teachers aged at the age of 40 are panic (about technology). They don't know what to do, but new/ young teachers are prepared.
13	I would say "somewhat agree".
14	I don't think so. Our students (future teachers) don't use the mobile phones to study. They do not download applications on the phone. They rely on the Internet.
15	No, this competence is very limited.
16	It depends on the style of teachers. Students learn about the courses and they learn from the teachers as well. For example, they learn also from my methods and the style I teach. Maybe in my class, they learn something. Maybe from other colleagues, they learn more. And maybe some teachers don't use it (ICT) at all.
17	It depends on individuals. Our students who have a second major in ICT have higher competence than those who don't. It depends on their background.

Table 29: Future EFL teachers' ICT competence is sufficiently developed for teaching English as a foreign language.

Despite the fact that we carried out a detailed analysis of the curriculum and the ICT topics it contained, we were interested in the opinion of the university EFL teachers. We asked them if their basic courses included the following topics:

a) training in using ICT for motivating students

b) training in using ICT for introducing new learning materials

c) training in using ICT for the fixation of knowledge

d) training in using ICT for testing acquired knowledge and skills

e) training in using ICT for teaching management

f) training in using ICT for cooperation and communication between institutions,

colleagues, teachers and students

g) training in basic ICT skills

h) training in the trends of education and in incorporating ICT in teaching English as a foreign language.

The measurement data can be viewed in the following diagrams:

g)		h)	
N:	17	N:	17
Mean:	1,471	Mean:	1,294
Median:	1,000	Median:	1,000
Min:	1,000	Min:	1,000
Max:	4,000	Max:	3,000
L-Qrt:	1,000	L-Qrt:	1,000
U-Qrt:	2,000	U-Qrt:	1,000
Variance:	0,765	Variance:	0,346
SD:	0,874	SD:	0,588
Std.Err:	0,212	Std.Err:	0,143
Skw:	2,008	Skw:	1,983
Kurt:	3,698	Kurt:	3,442
95% Conf SD		95% Conf SD	
Lower:	0,651	Lower:	0,438
Upper:	1,331	Upper:	0,895
95% Conf Mean		95% Conf Mean	
Lower:	1,021	Lower:	0,992
Upper:	1,920	Upper:	1,596
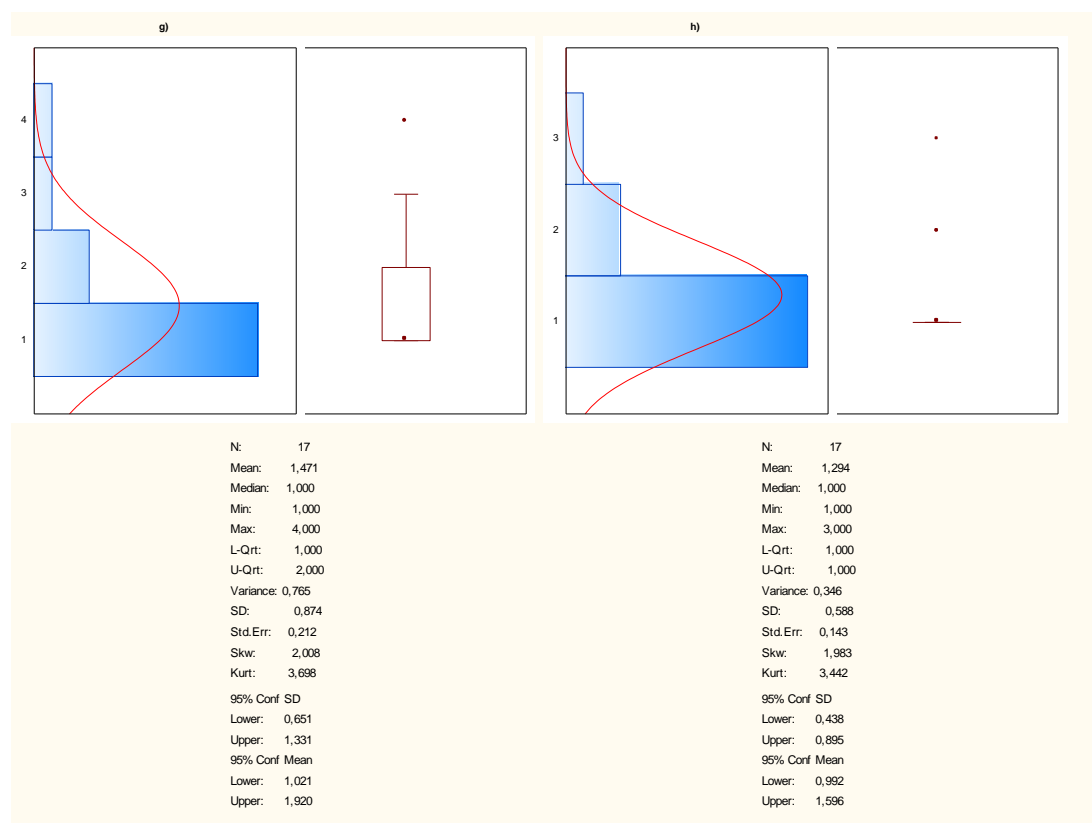
Chart 7: Are the following items concerning training in ICT in teaching English as a foreign language covered in current university curricula?

In the Czech Republic, language learning is usually closely linked to reading literature. For this reason, we included the following question in the interviews: "Do you consider it suitable to use children's literature e-books in teaching English as a foreign language?" You can see the answers in the following two graphs — separately for the 1st primary school level and the 2nd primary school level:

Graphical Summary for 1.–5. grade of the basic school

Shapiro-Wilk p:	0,00151
Mean:	2,118
Std.Dev.:	1,364
Variance:	1,860
Std.Err.Mean	0,331
Skewness:	0,934
Valid N:	17,00
Minimum:	1,000
Lower Quartile	1,000
Median:	2,000
Upper Quartile	3,000
Maximum:	5,000
95% Confidence for Std Dev	
Lower	1,016
Upper	2,076
95% Confidence for Mean	
Lower	1,416
Upper	2,819
95% Prediction for Observation	
Lower	-0,858
Upper	5,093

Chart 8: Do you consider it suitable to use children's literature e-books in teaching English as a foreign language? (1. – 5. grade)

Graphical Summary for 6.-9. grade of the basic school

Shapiro-Wilk p:	0,00003
Mean:	1,471
Std.Dev.:	0,514
Variance:	0,265
Std.Err.Mean	0,125
Skewness:	0,130
Valid N:	17,00
Minimum:	1,000
Lower Quartile	1,000
Median:	1,000
Upper Quartile	2,000
Maximum:	2,000
95% Confidence for Std Dev	
Lower	0,383
Upper	0,783
95% Confidence for Mean	
Lower	1,206
Upper	1,735
95% Prediction for Observation	
Lower	0,348
Upper	2,593
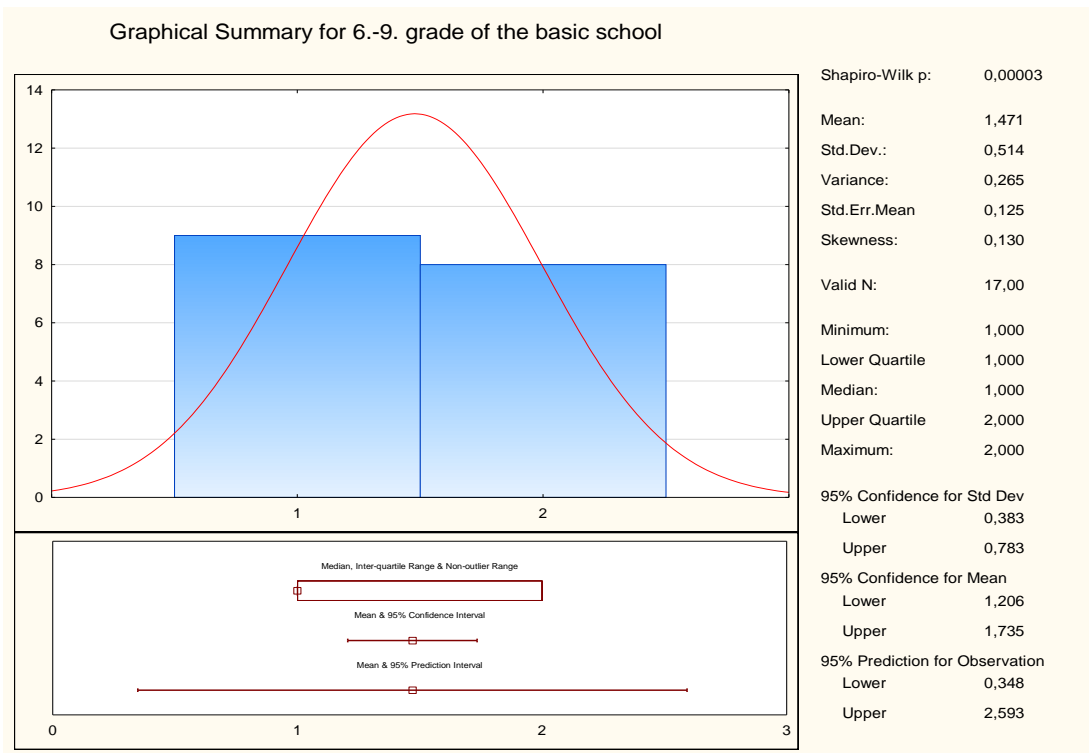
Chart 9: Do you consider it suitable to use children's literature e-books in teaching English as a foreign language? (6. – 9. grade)

As far as this last question is concerned, again we encouraged the respondents to discuss their opinions in detail. The responses of the respondents are recorded in the following table:

Respondent number	Free answers of the respondents: Do you consider it suitable to use children's literature e-books in teaching English as a foreign language?
1	I strongly agree for both categories provided that the teachers know how to use it.
2	As to motivating students, it might be useful. But there should be a balance between using e-books and traditional books.
3	In the 1-5 grade, I somewhat disagree. It is very important to teach students to love real books.
4	For both, I strongly agree.
5	For both grades, I 100% agree.
6	I strongly agree. Any books, not only e-books, if they are motivating, it is possible to use them. And E-books are more motivating.
7	For both of them, I strongly agree.
8	In the first stage, young children like to tough everything to see how it works. They like physical contact. In the second stage, children should be more concerned about the context (understanding literature).
9	For the first gade, I am not sure if they are able to read, because they are too young. But For the secondary leavel, I would say "yes", because learners likes e-books. They also like fairytales.
10	But it is important to build up relationship with real books (printed books) first, and then afterwards, they can use e-books.
11	Paper and textbooks are better to educate kids. They like physical contact. For teenages, ICT can help to catch their interest.

12	Teachers must be well prepared methodologically, because there are many stories (classical stories) in the e-books that students are very familiar with. They feel satisfied. And these are realized e-books. It is good to use them in the classroom.
13	For the first grade, I would say "somewhat agree"; for the second grade, I would say "strongly agree".
14	It is ok, but I think at the same time, they should be able to use printed books. I think it is a good idea to work with both suitable printed and electronic books. But I think the text should be suitable for the age (for their level of English).
15	Of course, it is necessary, it is suitable. I strongly agree. But still it is very rarely used. The most important problem of using e-books is that there is no standard procedures, so many of these texts are poor mistakes. The English is not standard because there is no professional editors. The quality of e-books is not guaranteed.
16	It depends on the format of the e-books. I don't have experiences with such children.
17	1-5 grade is too young to use e-books, but for 6-9 grade, I somewhat agree. But there should be an equal distribution of time in using e-books and real books.

*Table 30: Do you consider it suitable to use children's literature e-books in teaching English as a foreign language?*

3.8 Hypothesis Testing

As mentioned in Section 3.2, we tested the defined hypotheses to rule out the effects of gender, age, or nationality on the form of the professors' responses. The results of the tests are not intended to provide main research results, but we believe it is important to test for possible effects due to age, gender and nationality in order to spot possible differences within the research sample. We assume that there will be no effects, but if there are some, we will analyse these results further.

Pearson's chi-square and ML chi-square tests are used to test the following hypotheses. The calculation was carried out with Statistica.

Hypothesis 1

H$_1$: The opinions of academic employees on developing ICT competence in professional preparation of future EFL teachers are not dependent on gender.

H$_{10}$: The opinions of academic employees on developing ICT competence within the existing curricula of professional preparation of future EFL teachers are the same in case of men and women.

H$_{1A}$: The opinions of academic employees on developing ICT competence within the existing curricula of professional preparation of future EFL teachers differ in case of men and women.

Testing results:

Statistic	Statistics: Sex x Question no. 1		
	Chi-square	df	p
Pearson Chi-square	1,173810	df=3	p=,75929
M-L Chi-square	1,842588	df=3	p=,60571

Statistic	Statistics: Sex x Question no. 2, part 1		
	Chi-square	df	p
Pearson Chi-square	4,958333	df=1	p=,02597
M-L Chi-square	3,787330	df=1	p=,05164

Statistic	Statistics: Sex x Question no. 3, a)		
	Chi-square	df	p
Pearson Chi-square	,4857143	df=1	p=,48585
M-L Chi-square	,8319020	df=1	p=,36172

Statistic	Statistics: Sex x Question no. 3, b)		
	Chi-square	df	p
Pearson Chi-square	2,550000	df=1	p=,11029
M-L Chi-square	3,626689	df=1	p=,05686

Statistic	Statistics: Sex x Question no. 3, c)		
	Chi-square	df	p
Pearson Chi-square	,4857143	df=1	p=,48585
M-L Chi-square	,8319020	df=1	p=,36172

Statistic	Statistics: Sex x Question no. 5		
	Chi-square	df	p
Pearson Chi-square	,7806122	df=2	p=,67685
M-L Chi-square	1,295739	df=2	p=,52316

Statistic	Statistics: Sex x Question no. 7		
	Chi-square	df	p
Pearson Chi-square	2,664683	df=4	p=,61541
M-L Chi-square	3,707124	df=4	p=,44709

Statistic	Statistics: Sex x Question no. 8, a)		
	Chi-square	df	p
Pearson Chi-square	,3983371	df=2	p=,81941
M-L Chi-square	,5676347	df=2	p=,75290

Statistic	Statistics: Sex x Question no. 8, b)		
	Chi-square	df	p
Pearson Chi-square	,2354978	df=2	p=,88892
M-L Chi-square	,4088856	df=2	p=,81510

Statistic	Statistics: Sex x Question no. 8, c)		
	Chi-square	df	p
Pearson Chi-square	1,708995	df=2	p=,42550
M-L Chi-square	1,926827	df=2	p=,38159

Statistic	Statistics: Sex x Question no. 8, d)		
	Chi-square	df	p
Pearson Chi-square	2,550000	df=3	p=,46632
M-L Chi-square	3,063338	df=3	p=,38196

	Statistics: Sex x Question no. 8, e)		
Statistic	Chi-square	df	p
Pearson Chi-square	1,517857	df=3	p=,67816
M-L Chi-square	2,347931	df=3	p=,50340

	Statistics: Sex x Question no. 8, f)		
Statistic	Chi-square	df	p
Pearson Chi-square	1,987013	df=2	p=,37028
M-L Chi-square	2,953017	df=2	p=,22843

	Statistics: Sex x Question no. 8, i)		
Statistic	Chi-square	df	p
Pearson Chi-square	,9444444	df=3	p=,81469
M-L Chi-square	1,211421	df=3	p=,75027

	Statistics: Sex x Question no. 8, j)		
Statistic	Chi-square	df	p
Pearson Chi-square	1,120879	df=2	p=,57096
M-L Chi-square	1,798667	df=2	p=,40684

	Statistics: Sex x Question no. 9, a)		
Statistic	Chi-square	df	p
Pearson Chi-square	4,098214	df=4	p=,39288
M-L Chi-square	5,258963	df=4	p=,26174

	Statistics: Sex x Question no. 9, b)		
Statistic	Chi-square	df	p
Pearson Chi-square	3,238095	df=1	p=,07194
M-L Chi-square	4,386720	df=1	p=,05622

Table 31: Testing results - Chi-square (gender)

In case of gender, the testing result is above the set significance level (0.05). Therefore, it is impossible to refuse the H10 hypothesis and with a high probability it is viable to suppose that the opinions of academic employees regarding the development of ICT competence are the same in case of men and women.

Hypothesis 2

H2: The opinions of academic employees on developing ICT competence in professional preparation of future EFL teachers are not dependent on age.

H_{20}: The opinions on developing ICT competence in professional preparation of future EFL teachers are the same in case of young and old academic employees.

H_{2A}: The opinions on developing ICT competence in professional preparation of future EFL teachers differ in case of young and old academic employees.

Testing results:

Statistic	Statistics: Age x Question no. 1		
	Chi-square	df	p
Pearson Chi-square	1,311429	df=3	p=,72642
M-L Chi-square	1,395253	df=3	p=,70665

Statistic	Statistics: Age x Question no. 2, part 1		
	Chi-square	df	p
Pearson Chi-square	1,517857	df=1	p=,21794
M-L Chi-square	1,864786	df=1	p=,17207

Statistic	Statistics: Age x Question no. 2, part 2		
	Chi-square	df	p
Pearson Chi-square	0,000000	df=0	p=1,0000
M-L Chi-square	0,000000	df=0	p=1,0000

Statistic	Statistics: Age x Question no. 3, a)		
	Chi-square	df	p
Pearson Chi-square	1,586667	df=1	p=,20780
M-L Chi-square	2,307111	df=1	p=,12878

Statistic	Statistics: Age x Question no. 3, b)		
	Chi-square	df	p
Pearson Chi-square	,0138776	df=1	p=,90622
M-L Chi-square	,0138629	df=1	p=,90627

Statistic	Statistics: Age x Question no. 3, c)		
	Chi-square	df	p
Pearson Chi-square	1,586667	df=1	p=,20780
M-L Chi-square	2,307111	df=1	p=,12878

Statistic	Statistics: Age x Question no. 5		
	Chi-square	df	p
Pearson Chi-square	2,844898	df=2	p=,24112
M-L Chi-square	3,913383	df=2	p=,14133

Statistic	Statistics: Age x Question no. 7		
	Chi-square	df	p
Pearson Chi-square	7,710714	df=4	p=,10277
M-L Chi-square	10,21836	df=4	p=,05691

Statistic	Statistics: Age x Question no. 8, a)		
	Chi-square	df	p
Pearson Chi-square	1,665306	df=2	p=,43489
M-L Chi-square	2,016841	df=2	p=,36479

Statistic	Statistics: Age x Question no. 8, b)		
	Chi-square	df	p
Pearson Chi-square	1,536623	df=2	p=,46380
M-L Chi-square	1,884094	df=2	p=,38983

Statistic	Statistics: Age x Question no. 8, c)		
	Chi-square	df	p
Pearson Chi-square	,4857143	df=2	p=,78438
M-L Chi-square	,4871998	df=2	p=,78380

Statistic	Statistics: Age x Question no. 8, d)		
	Chi-square	df	p
Pearson Chi-square	3,995000	df=3	p=,26200
M-L Chi-square	5,075895	df=3	p=,16632

Statistic	Statistics: Age x Question no. 8, e)		
	Chi-square	df	p
Pearson Chi-square	2,033929	df=3	p=,56539
M-L Chi-square	2,405939	df=3	p=,49253

Statistic	Statistics: Age x Question no. 8, f)		
	Chi-square	df	p
Pearson Chi-square	3,037922	df=2	p=,21894
M-L Chi-square	3,413735	df=2	p=,18143

Statistic	Statistics: Age x Question no. 8, i)		
	Chi-square	df	p
Pearson Chi-square	3,238095	df=3	p=,35635
M-L Chi-square	3,939385	df=3	p=,26808

Statistic	Statistics: Age x Question no. 8, j)		
	Chi-square	df	p
Pearson Chi-square	3,661538	df=2	p=,16029
M-L Chi-square	5,089982	df=2	p=,07847

Statistic	Statistics: Age x Question no. 9, a)		
	Chi-square	df	p
Pearson Chi-square	2,377976	df=4	p=,66661
M-L Chi-square	3,085536	df=4	p=,54361

Statistic	Statistics: Age x Question no. 9, b)		
	Chi-square	df	p
Pearson Chi-square	,4857143	df=1	p=,48585
M-L Chi-square	,4871998	df=1	p=,48518

Table 32: Testing results - Chi-square (age)

In case of age, the testing result is above the set significance level (0.05). Therefore, we cannot refuse the null hypothesis and with a high probability it is possible to suppose that the opinions of future EFL teachers regarding ICT competence are the same in case of young and old employees.

Hypothesis 3

H₃: The opinions of academic employees on developing ICT competence in professional preparation of future EFL teachers are not dependent on the Slovak or Czech citizenship.

H_{30}: The opinions on developing ICT competence in professional preparation of future EFL teachers are the same in case of academic employees in the Slovak and the Czech Republic.

H_{3A}: The opinions on developing ICT competence in professional preparation of future EFL teachers differ in case of academic employees in the Slovak and the Czech Republic.

Testing results:

Statistic	Statistics: Country x Question no. 1		
	Chi-square	df	p
Pearson Chi-square	5,440000	df=3	p=,14227
M-L Chi-square	5,585042	df=3	p=,13364

Statistic	Statistics: Country x Question no. 2, part 1		
	Chi-square	df	p
Pearson Chi-square	7,968750	df=1	p=,00476
M-L Chi-square	4,833826	df=1	p=,02791

Statistic	Statistics: Country x Question no. 2, part 2		
	Chi-square	df	p
Pearson Chi-square	0,000000	df=0	p=1,0000
M-L Chi-square	0,000000	df=0	p=1,0000

Statistic	Statistics: Country x Question no. 3, a)		
	Chi-square	df	p
Pearson Chi-square	,3022222	df=1	p=,58249
M-L Chi-square	,5349249	df=1	p=,46454

	Statistics: Country x Question no. 3, b)		
Statistic	Chi-square	df	p
Pearson Chi-square	1,586667	df=1	p=,20780
M-L Chi-square	2,307111	df=1	p=,12878

	Statistics: Country x Question no. 3, c)		
Statistic	Chi-square	df	p
Pearson Chi-square	3,192222	df=1	p=,07399
M-L Chi-square	2,194669	df=1	p=,13849

	Statistics: Country x Question no. 5		
Statistic	Chi-square	df	p
Pearson Chi-square	,4857143	df=2	p=,78438
M-L Chi-square	,8319020	df=2	p=,65971

	Statistics: Country x Question no. 7		
Statistic	Chi-square	df	p
Pearson Chi-square	9,775000	df=4	p=,04439
M-L Chi-square	7,816478	df=4	p=,09854

	Statistics: Country x Question no. 8, a)		
Statistic	Chi-square	df	p
Pearson Chi-square	2,014815	df=2	p=,36516
M-L Chi-square	2,780447	df=2	p=,24902

	Statistics: Country x Question no. 8, b)		
Statistic	Chi-square	df	p
Pearson Chi-square	1,236364	df=2	p=,53892
M-L Chi-square	1,884094	df=2	p=,38983

	Statistics: Country x Question no. 8, c)		
Statistic	Chi-square	df	p
Pearson Chi-square	,4092593	df=2	p=,81495
M-L Chi-square	,6294467	df=2	p=,72999

	Statistics: Country x Question no. 8, d)		
Statistic	Chi-square	df	p
Pearson Chi-square	3,513333	df=3	p=,31904
M-L Chi-square	3,040911	df=3	p=,38536

	Statistics: Country x Question no. 8, e)		
Statistic	Chi-square	df	p
Pearson Chi-square	1,345833	df=3	p=,71828
M-L Chi-square	1,788155	df=3	p=,61752

	Statistics: Country x Question no. 8, f)		
Statistic	Chi-square	df	p
Pearson Chi-square	1,236364	df=2	p=,53892
M-L Chi-square	1,884094	df=2	p=,38983

	Statistics: Country x Question no. 8, i)		
Statistic	Chi-square	df	p
Pearson Chi-square	,9444444	df=3	p=,81469
M-L Chi-square	1,501690	df=3	p=,68188

	Statistics: Country x Question no. 8, j)		
Statistic	Chi-square	df	p
Pearson Chi-square	,6974359	df=2	p=,70559
M-L Chi-square	1,152760	df=2	p=,56193

	Statistics: Country x Question no. 9, a)		
Statistic	Chi-square	df	p
Pearson Chi-square	2,550000	df=4	p=,63571
M-L Chi-square	3,317797	df=4	p=,50612

	Statistics: Country x Question no. 9, b)		
Statistic	Chi-square	df	p
Pearson Chi-square	2,014815	df=1	p=,15577
M-L Chi-square	2,780447	df=1	p=,09542

Table 33: Testing results - Chi-square (country)

In case of citizenship, the testing result is above the set significance level (0.05). Therefore, it is not possible to refuse the null hypothesis and with a high probability we can suppose that the opinions on ICT competence are the same in case of Czech and Slovak academic employees.

4 RESULTS AND DISCUSSION

The research surveys have provided a range of data that need to be analyzed, interpreted and put into context. This is what we will target in this part of the dissertation, whereby we will also try to refute or confirm the following research assumptions:

- **Research assumption 1:** University degree programs preparing future EFL teachers, in most cases, include courses aimed at ICT competence development.

- **Research assumption 2:** Courses that focus on ICT competence development are more focused on user skills development.

- **Research assumption 3:** University EFL teachers believe that the current curricula are sufficient enough to develop future EFL teachers' ICT competence.

- **Research assumption 4:** University teachers believe that training in using ICT for introducing new learning materials is included to a greater extent than training in other ICT competencies.

4.1 The Content of University Courses in the Context of Current Needs

Before we look at the results of the content analysis of the study programs, or more precisely, scrutinize the subjects focusing on the development of ICT competence, we present the identified subjects focusing on ICT in a table. This will allow us to carry out further comparative analysis and view the results from multiple angles.

As we have already mentioned, education at universities in the Czech Republic during the years 2018 - 2019 underwent innovations which have been reflected in key documents. The so-called Accreditation Commission ceased to exist and a new National Accreditation Office was established, which sets new rules for the accreditation of study programs at all levels – bachelor's, master's and doctoral's. Universities prepare and submit new accreditation files for approval. Subsequently innovations in higher education take place. This creates a unique chance for comparison of two concepts of teacher training at the same university in a relatively well-traceable period of time. It is

also possible to examine whether the development of ICT has been reflected in teacher training. We fully realized this when the COVID-19 pandemic hit the world. The research results will also be remarkable in that during the pandemic, teachers, pupils, parents and other educational players became fully aware of the importance of ICT for education. Without ICT, education would not be possible during the lockdown period. In our analysis, we will thus be able to observe what progress has been made and whether it has taken place at all as the new accreditations were prepared at the time before the COVID pandemic broke out. We look at whether there are any positive shifts or whether the universities stay in the same place during the transition from the old accreditations to the new ones and whether there are more ICT courses and content innovations included in the curricula.

In order to to reveal similarities or possible differences, we put the subjects which focus on the development of ICT competence and are currently still included in the closing study programs into the following table :

Table 34: Subjects focusing on development of ICT competence in the study programs of the universities (old accreditation)

University	Name of the courses	B/M	Compulsory / optional / required optional	Specific for future EFL (Yes/No)
U1	Practicum of Didactic Technology	B	Required optional	No
	Methodology of E-learning	B	Required optional	No
	Practical Activities with ICT	B	Required optional	No
	Application of Information and Communication Technologies I	B	Required optional	No
	Basics of Computer Science I	B	Required optional	No

	Basics of Computer Science Π	B	Required optional	No
	Methodology of Work with Interactive Instructional Systems	B	Optional	No
	Multimedia in Teaching Foreign Language	M	Optional	Yes
U2	Computer Science for EFL Students	B	Required optional	Yes
	Computer Technology for EFL Teachers	M	Required optional	Yes
	Exercises in Didactic Technologies	B	Compulsory	No
U3	Applied Informatics I	B	Required optional	No
	Information and Communication Technology	B	Required optional	No
	Informatics and School Administration	B	Required optional	No
	Applied Informatics Π	B	Required optional	No
	Didactic Technology	M	Optional	No
U4	The study did not exist before.	-	-	-
U5	Processing and Presentation of Electronic Documents	B	Optional	No
	Computer Graphics	B	Optional	No
	Websites Development	B	Optional	No
	Cloud Data Processing	B	Optional	No
	Computer in Education	M	Optional	No

	Use of Mobile Touch Technologies in Teaching	M	Optional	No
	Interactive Technology in Education	M	Optional	No
	Educational Technology in the Work of a Teacher	M	Optional	No
U6	Information Technology in Teaching	B	Compulsory	No
	Modern Technology in Education	B	Required optional	No
	Video Technologies at Schools	B	Optional	No
	The Use of Information and Communication Technology in Teaching	M	Required Optional	No
U7	Informatics	B	Compulsory	No
U8	The Use of Technology in Teaching English as a Foreign Language	B	Compulsory	Yes
	Topics from Didactics of English: Computer in Language Learning	M	Required optional	Yes
U9	no subject focused on ICT	-	-	-
U10	Processing Electronic Documents	B	compulsory	No
	Multimedia in Schools	M	optional	No
	Methods of Searching and Obtaining Information	M	Optional	No
	Digital Technology in Teaching	M	Required optional	No

U11	Information Technology	B	Compulsory	No
	Graphic Presentation	B	Optional	No
	Work with Interactive Whiteboards	B	Optional	No
	Technology in Education	M	Compulsory	No

Subsequently, we put the newly accredited subjects focusing on the development of ICT competence into the following table:

Table 35: Subjects focusing on development of ICT competence in the study programs of the universities (new accreditation)

University	Name of the courses	B/M	Compulsory / optional / required optional	Specific for future EFL (Yes/No)
U1	Practicum of Didactic Technology	B	Required optional	No
	Methodology of E-learning	B	Required optional	No
	Practical Activities with ICT	B	Required optional	No
	Application of Information and Communication Technologies I	B	Required optional	No
	Basics of Computer Science I	B	Required optional	No
	Basics of Computer Science П	B	Required optional	No

	Methodology of Work with Interactive Instructional Systems	B	Optional	No
	Multimedia in Teaching Foreign Language	M	Optional	Yes
U2	Exercise in Didactic Technology	B	Compulsory	No
	Computing for English Learners	B	Required optional	Yes
	Computer Technology for English Foreign Language Teachers	M	Required optional	Yes
U3	ICT in Education 1	B	Compulsory	No
	ICT in Education 2	B	Required optional	No
	Multimedia in Teaching English	M	Required optional	Yes
U4	Information Technology in Education	B	Compulsory	No
	ICT in Teaching	M	Required optional	No
U5	Processing and Presentation of Electronic Documents	B	Required optional	No
	Computer Graphics	B	Required optional	No
	Web Sites Development	B	Required optional	No
	Cyber Security	M	Required	No

			optional	
	Didactics of the English Language Ⅲ	M	compulsory	Yes
	Didactics of English Language I	M	compulsory	Yes
U6	Information Technology in Teaching	B	Compulsory	No
	Modern Technology in Education	B	Required optional	No
	The Use of Information and Communication Technology in Teaching	M	Required optional	No
	Didactic and Information Technology A	M	Optional	No
U7	Informatics	-B	Compulsory	No
U8	Use of Technologies in Teaching English as a Foreign Language	B	Compulsory	Yes
U9	Information Technology in English Language Teaching	M	Required optional	Yes
U10	Electronic Document Processing	B	Compulsory	No
	Multimedia in School Projects	B	Optional	No
	Digital Technology in Teaching.	M	Required optional	No
U11	the syllabi have not yet been included in the information system.	-	-	-

University no. 1

University no. 1 is a big Slovakian higher educational institution that trains EFL teachers. This is one of the reasons it was selected as the institution to conduct the research study at the curriculum analysis level. Slovakia has adopted new regulations according to which the accreditation of study programs is carried out, but the individual universities are currently still preparing new accreditation documents. Existing courses have been around for many years.

In U1, there are eight courses related to the development of ICT competence. Seven of the courses are for students of the bachelor's degree program and the seven courses are not specific for students majoring in teaching English as a foreign language. There is one course called "*Multimedia in Teaching Foreign Language*" for students of the master's degree program and this course is specific for students majoring in teaching English as a foreign language, but the course is an optional course. Therefore, there is no compulsory course for the development of future EFL teachers' ICT competence.

It can be stated that this form of preparation is not optimal for future EFL teachers and should be improved. On the one hand, there is a problem of the choice of individual subjects, which means that a certain group of students cannot pass some subjects at all, and on the other hand, there is a problem of content in connection with what each teacher must have in terms of professional competencies. There is a complete lack of classes that focus on working with management software related to the classroom, specifically working with the electronic class register, electronic student register, certificate creation, etc. On the other hand, there is a huge area of curricula that focus on developing competence related to the use of ICT. It should be noted that these competencies begin to develop in primary school and then continue in secondary school. It is therefore questionable as to whether this should still be given so much attention today, in the 21st century.

There were no changes in the degree programs from the time the data were collected to the time the dissertation was carried out. No new subjects were created and the learning content of the existing subjects was not changed in any way.

University no. 2

This university has been training EFL teachers for a long time and is one of the traditional Czech universities with roots dating back to the sixteenth century. It is the second oldest university in Czechia and the oldest in Moravia.

Under the old accreditation, there was a course in didactical technology exercises that all students were required to complete. This enabled them to acquire a good level of didactical skills related to the use of ICT in the classroom. However, the subject was not subject-specific, as it was taken by future teachers of all professions. Therefore, the aspects related to the specifics of teaching English with the use of ICT have not been addressed. Thanks to the coding carried out, it was found that around 95% of the content of this subject falls into the *ICT Didactics* category. The concept of the course can also be described as modern from today's perspective, and this course should not be missing when it comes to preparing teachers. The fact that this course is included in the undergraduate degree course has to be mentioned. At the same level, i.e., in the bachelor's degree course, students are offered the course *Computer Science for English Students* as a major. The content of this course focuses on developing ICT competence closely related to English language teaching. In our opinion, this subject should be compulsory for prospective students, and not just offered as an option, the way it was intended. The probability of choosing it was high, however, as it was part of the category of so-called elective subjects. We will explain what this means. Students are required to choose a predetermined number of elective subjects from a limited group of elective subjects — it can only be one course, but usually, it is more than one course. In practice, the selection of courses is based on the number of credits that the elective courses carry. The coding carried out showed that approx. 95% of the educational content belongs to the category *Subject-specific ICT didactics*.

At the master's level, which follows the bachelor's level, students can take an elective course *Computer Technology for EFL Teachers*. The aim is to expand the skills acquired during A level studies. Thanks to the coding, it was found that 100% of the content of this course falls into the category *Subject-specific ICT didactics*.

The same number of subjects can also be found in the newly accredited courses for preparing EFL teachers. Here, too, there is a compulsory elective course *Exercise in Didactic Technology*, whose content is essentially identical to the course of the old accreditation. Again, it is a compulsory subject. The second course in the bachelor's

degree, *Use of Computers for Learners of English*, is new in terms of content. Although the title makes it clear that the course is specific for English learners, this is not very clear from the course content (e.g. creating your own ppt and other presentations, uploading your own files and links to the group/student wiki). The master's degree course includes an elective course in *Computer Technology for English Foreign Language Teac*hers, which is similar in content to the same course of the old accreditation. We see it as a disadvantage that some students are not allowed to pass this subject due to its optional nature. There are no courses that focus on the categories *Using ICT for online teaching and LMS* and *Use of ICT for administration related to teaching*, which we rate as negative.

University no. 3

According to the old accreditation, students preparing for the profession of teaching English as a foreign language could choose up to 4 elective courses with a focus on ICT development at the undergraduate level. These courses are essentially geared towards developing user skills, which, from today's perspective, students should bring with them from secondary school. The following topics are examples: information technology and society; man versus computer; the use of computers and management of files; creation of directory. In terms of content, however, the course *Informatics and School Administration* is to be emphasised with the most widespread software packages for school administration and registry and trends and innovations in the use of information and communication technology in school administration. Few universities prepare their administrations to work with information systems. However, the above-mentioned optionality is not optimal. There is no course at all at the undergraduate level that is specifically designed for English language students. There is an elective course at the master's level, *Didactic Technology*, which is specially designed for future EFL teachers. To summarise the results of the analysis of the previously valid courses (old accreditation): due to the elective nature of the courses, the students' ICT competence may not have been developed at all .

There are 3 courses within the newly accredited degree programs. The *ICT in Education 1* includes lessons that focus on the development of ICT user skills and didactics. The fact that this is a compulsory subject that all students have to take is clearly a positive factor. Students can further develop their acquired skills by taking the

ICT in Education 2, which contains very useful and practically applicable materials — for example, students learn to work with interactive whiteboards, create interactive presentations and assignments using LMS systems or the principles of the so-called flipped classroom.

The master's degree offers an elective *Multimedia Course in English Language Teaching*. The content falls fully into the category *Subject-specific didactics of ICT*, which fully meets the needs of future EFL teachers. Examples of useful topics are language learning programs, online materials and interesting websites, Internet pronunciation and vocabulary, electronic dictionaries, Internet grammar, electronic interactive textbooks, online collaboration and teacher training, school collaboration, e-twinning, projects. One of the topics falls under the category *Using ICT for online teaching and LMS*, specifically including topics such as e-learning, LMS and virtual worlds. We take a critical position on the optionality of the topic. In our opinion, all students should pass this course.

University no. 4

This university has not yet trained any English teachers. However, newly accredited courses have been set up at both bachelor's and master's levels. Analysing them allows us to conclude that students complete a compulsory subject, *Multimedia in Teaching Foreign Language*, as part of their bachelor's degree. This is a topic that involves learning from more than one category, which we consider positive. Specifically, it is all about didactics of ICT, using ICT to search for new knowledge, training in basic ICT knowledge and skills. The subsequent master's course includes an elective *ICT in Tteaching*. It appears to be very well designed with regard to teachers of the 21st century. However, we see this as negative as it is optional and that not all students have to take it. But the current pandemic shows that the skills taught in the course are in great demand. We wish to emphasise the topic of Kahoot!, a freely accessible app that is suitable for targeting learning through quizzes. On the positive side, it runs on Android, iOS and Windows devices. It is basically about creating learning materials through multiple-choice quizzes.

University no. 5

This is a traditional Czech university with a long history. On the basis of the analysis of the gradual discontinuation of courses, which correspond to the now outdated accreditation, we have to state that preparing EFL teachers with regard to the development of ICT competence was not optimal, although many courses were offered compared to other universities. As part of the bachelor's degree, 4 electives were offered: *Processing and Presentation of Electronic Documents*; *Computer Graphics*; *Websites Development and Cloud Data Processing*. The *Processing and Presentation of Electronic Documents* course focuses on developing competencies that are already well-developed enough today with college students starting university. The basics are learnt in primary schools and further developed in secondary schools. From today's perspective, this topic no longer makes sense at universities. A special feature is a course that focuses on computer graphics, which, in addition to raster graphics, also deals with vector graphics. The content in terms of developed competencies exceeds the needs of English teachers, although it is true that until about 15 years ago teachers were more often the creators of digital learning materials where these skills could be actively applied. However, creating digital learning materials is usually time-consuming, something that is incompatible with the already time-consuming task of the teaching profession. Teachers these days tend to use pre-made teaching aids.

Similarly, English teachers rarely create websites. Rather, they act as users. If they are already creating web content, they use easy-to-use content management systems in which individual tags are no longer written. However, these days, sophisticated LMS systems are used for sharing educational content, so the subject seems less tied to the real needs of teachers. Nor is the *Cloud Computing* course directly aimed at developing the necessary skills for EFL teachers. However, one of the topics shows promising signs, namely: selecting cloud environment Google Apps for education, electronic support link of web resources, Google Drive and Google Classroom. Knowledge of these topics is particularly important at a time when digital learning is being used more than usual.

The master's program, in which the final undergraduate students graduate, includes four elective subjects that focus on ICT competence development — *Computers in Education, Use of Mobile Touch Technologies in Education, Interactive Technology in Education, and Educational Technology with Teachers' Work*. Similar to the BA, these are not specifically designed for future EFL teachers. They are aimed at students in

general and can be chosen by students of any discipline. The *Computer in Education* course focuses on the general principles of using computers and similar digital technologies in education, with a part also aimed at practical aspects and skills training. We rate this as positive. Positive is also the content of the *Mobile Technology in Education* course, as it is designed to be completely timeless, as we see mobile technologies starting to dominate not only the education sector but also everyday life.

Every primary and secondary school teacher must be proficient in using interactive whiteboards and other similar technologies. Therefore, the *Interactive Technology in Education* course seems to be very well designed. Students are introduced to theoretical knowledge, the principles of creating interactive teaching materials and the didactical aspects of using digital technologies in the classroom. *Educational Technology for Teachers* is a similarly rigorous course that introduces students to the importance of educational technology in the context of modern pedagogy. The content is very detailed, covering a number of topics that hold promise.

The newly accredited courses contain noticeably fewer ICT-based subjects. At the bachelor's level, these are the courses in *Processing and Presenting Electronic Documents, Computer Graphics and Website Creation*, whereby these courses have actually only been included in the new accreditation files. The content has essentially not been changed. There are three courses in the master's program — *Cyber Security, Didactics of the English language I, Didactics of the English language III*, which deal with ICT. It is a fact that these subjects only deal with didactics marginally. A special offer is the *Cyber Security* course, which EFL teachers can choose if they want. Its content (we choose from the following topics for illustration purposes: committees and organisations that deal with cyber security, their scope and work for schools, e.g., NÚKIB, Saferinternet) is more suitable for computer science students.

University no. 6

Despite the fact that there is no undergraduate or graduate course specifically designed for students becoming EFL teachers, one can say that preparing future teachers in terms of ICT competence development is being carried out well. All existing courses are well thought out. A big plus is that there is at least one subject in the

bachelor's degree in the old and new accreditation that all students are required to attend (namely: *Information Technology in Teaching*). This course focuses on the development of didactic-technological competencies. In addition, students can choose an additional course — *Modern Technology in Education*. The old accreditation had a *Video Technologies at Schools* course, but we find it very specific, as teachers nowadays tend to use pre-made videos rather than creating their own ones. With the development of distance learning, they can record the lesson at most, but that does not require any special skills. This is the reason why this topic is no longer included in the new accreditation.

The continuation of the former master's course, in which the last students are now completing their studies, includes the subject The *Use of Information and Communication in Teaching* as part of the old accreditation. It is specially designed for English language teaching students. The disadvantage is that it is an elective subject, and therefore some students may not take it at all. The ICT topics dealt with are oriented towards didactics.

The newly accredited degree programs also include courses aimed at developing students' ICT competence in teaching. Basically, the subject *Video Technologies at Schools* was cancelled, but it is not a problem as a new subject was created. The subjects *Information Technology in Education* and *Modern Technologies in Edu*cation remained at the bachelor's level. As part of the master's course, students can choose the new courses *The Use of Information and Communication in Teaching* and *Didactics and Information Technology A*. However, this subject was previously available in other courses and is now also offered to students becoming English teachers. This is probably the reason why the learning content does not have any modern elements — e.g., the following topics are included: the creation of a video file and a DVD, DVD recorder options, video digitalisation.

University no. 7

The form of ICT competence development for teachers under the so-called old accreditation, which is still valid and under which future English teachers are still studying, cannot be called optimal. All students take a compulsory *Computer Science* course. If you analyse the content of this course, you will notice that it does not

correspond to the current trends and competency framework, e.g., the topics Word, Excel and free software (Linux, Latex, Beamer, Gimp2, Gnuplot, etc.) are included.

The courses that have been included in the new accreditation file have not yet been added to the system and can therefore not be evaluated.

University no. 8

It is one of the largest universities in the Czech Republic. Compared to other universities, the development of ICT competence has a peculiarity that there is no course that is taken by students other than EFL students. There are cases among universities where there are only courses that develop general ICT competence. This subject is missing at university no. 8. However, there is a subject-specific course, namely *The Use of Technology in Teaching English as a Foreign Language*, which is very positive. Within the framework of the expiring accreditation, the content is also promising from a technical point of view — e.g., the following topics are included: using mobile applications that can facilitate the process of speaking, project-based learning with technology and using games to teach English. In addition, students can choose an additional course: *Topics from Didactics of English: Computers in Language Learning*.

In the newly accredited courses, there is only one subject: *The Use of Technology in Teaching English as a Foreign Language*. At the master's level, there is no longer a subject that focuses on developing ICT competence. Paradoxically, the new accreditation has worsened the situation regarding the development of ICT competencies of future teachers.

University no. 9

No course focusing on the development of ICT competence was included in the expiring degree course. This cannot be regarded as correct, and the university has probably also recognised this, as it has included the subject *Information Technology in Teaching English Language* in the new accreditation of the postgraduate master's course. In terms of content, the course is very well designed — topics related to e-learning are also dealt with, which is currently very desirable (e.g., MS Teams, Zoom,

Google Meet). However, students are not taught how to use school management information systems, which can be considered a disadvantage. Another disadvantage is that it is an elective subject and some students may not take the course at all. It is also necessary to mention that there is no course that focuses on ICT competence development in the bachelor's degree program.

University no. 10

This university, which historically has dealt more with education in the fields of engineering and textile technology, has also been training English teachers for several decades. When we analysed the curricula, surprisingly, we discovered that there are more subjects that focus on ICT competence development than is common. Specifically, the following subjects are taught: *Film and Modern Media; Processing Electronic Documents; Digital Technology in Teaching; Multimedia in Schools; Methods of Searching and Obtaining Information.* At first glance, this is an excellent study option, but only the *Electronic Document Processing* course, which is included in the bachelor's degree, is compulsory. A closer look at the content reveals that it is not very modern, and rather involves developing user skills that are more in line with secondary schools. We rate the master's degree program as much better in terms of focusing on ICT subjects, but again the problem is the choice of the subject. In this way, the students do not even have to develop their ICT competence as part of their studies.

With the new accreditation, there came a change — the courses were reduced. There is a compulsory and an elective course at the bachelor's level, and an elective course at the master's level. In terms of content, there were no changes, which is certainly not a positive thing, as the opportunity to make changes was not seized. In this way, students are introduced to the subject of *Processing Electronic Documents*, which is more in line with secondary education. Students still do not engage in learning activities aimed at developing the following skills: working with software for classroom-related management, didactic-oriented work with ICT and working with online video communication and e-learning systems.

University no. 11

There are three subjects in the bachelor's degree, one of which is compulsory. This is a course in *Information Technology* that is designed so that its content thematically corresponds to the secondary school curriculum. That is not adequate. The knowledge acquired in the *Graphics* course can be used by student teachers when preparing worksheets for school children. It is important to understand the main focus of the course: working with the interactive whiteboard. Students receive the knowledge they need to implement modern teaching methods in the classroom. We say this because we know that there are cases in the Czech Republic where recent graduates starting their professional life do not even know how to use an interactive whiteboard, and they need to be trained. At the master's level, there is a well-designed *Technology in Education* course that is compulsory for students and ensures that all students develop appropriate skills. Unfortunately, the students are not introduced to subjects such as e-learning, information systems for school administration, specific use of ICT in English classes.

This applies to courses of study whose accreditation is gradually expiring and to newly designed courses that are gradually being offered. We analysed the bachelor's degree course and found out that it does not have a course focused on ICT competence development. We were not able to look at the master's curriculum because the curriculum is not yet included in the information system.

The qualitative information above shows that research assumption 1 has been confirmed. One can argue that university courses preparing future EFL teachers in most cases contain subjects aimed at ICT competence development.

However, research assumption 2 could not be confirmed. The claim that the subjects aiming at ICT competence development are more focused on user skills development cannot be asserted. It is true that they are adequately developed, often beyond the level appropriate to the needs of school lessons, but there is also a clear depiction of subjects that focus on the development of didactical ICT competence (working with interactive whiteboards and didactic aspects of using computers, working with a data projector by using a tablet and other digital technologies) and didactically specific work with ICT.

4.2   University Teachers' Perspectives on the Development of Future EFL Teachers' ICT Competence

University teachers' opinions on the current form of preparation of future EFL teachers for ICT competence development differ. Basically, we can follow two groups, which can also be seen in the results diagram. This is in line with the results of the curriculum analysis — there are universities with excellent quality plans and universities that do not place much emphasis on ICT competence development. There are also changes related to accreditation, which one teacher pointed out when he said, "I don't think it is sufficient enough right now. But at the same time, we are in a good position. Because there is a change in the system of accreditation programs at universities in the Czech Republic. The universities have opportunities to present new programs. If they get the accreditation for the new programs, I think we can implement new approaches and I think ICT should be one of the approaches which should be implemented more." One might rightly assume that the differences are due to gender or age. The idea is that men or younger university teachers, for example, place more emphasis on developing ICT competence. To refute this assumption, we conducted statistical tests. The results clearly showed that there was no influence of gender or age on the results. The differences are due to the experience of the teaching staff and the affiliation to the individual universities.

During the interviews, we were interested in the teachers' views on using ICT in primary schools. The reason for this is that these university teachers reflected these views in their work environment within the university education system of future teachers. Surprisingly, the results indicated a strange phenomenon. The teachers are in principle for the use of ICT in English lessons at primary schools and are therefore in line with current trends.

When asked "which ICT competence needs to be improved for future EFL teachers", most respondents ticked the item "application software for language teaching" (88.2%) and the item "using digital learning resources for teaching" (88.2%). Approximately 58.8% of the respondents ticked the item "using social media for language teaching". The reason is that some respondents say social media sometimes are dangerous. Some respondents say children should be taught responsibility, but not really use social media as a tool for learning language. Some respondents did not choose "social media", because they think that future EFL teachers have already used it.

We were also interested in how university teachers rate the level of ICT competence

of future English teachers. They definitely think there is room for improvement, even if some say the standard is excellent. We can assume that the respondents project their level of competency towards the assessment, which acts as an imaginary benchmark. If we return to the first question, we can see a certain consensus of opinion in the sense that respondents claim, on the one hand, that there is a need to improve the quality of the curriculum and, on the other hand, that it is necessary to further develop the ICT competence of future EFL teachers.

When we asked what the goal of developing future EFL teachers' ICT competence is, we received some remarkable answers. Here is one, for example: "Using ICT wisely. Teachers should know the aim and benefits of how to use it. What do they want to get out of it? For example, when I use video from YouTube, why is it better than a poster? Because sometimes a poster is better. In some primary schools, they have classrooms and there are posters." Most of the answers, however, focus on basic user skills and less on school information systems, e-learning or didactical aspects of teaching English with ICT. This brings us to the discrepancy between the design of the curriculum in terms of opportunities for ICT competence development and the views of university teachers. They do not concur.

When we asked the respondents whether future EFL teachers' ICT competence is sufficiently developed for teaching English as a foreign language, we found out that their opinions can be basically divided into two categories. The first category of the respondents hold the view that future EFL teachers' ICT competence is sufficiently developed for teaching English as a foreign language and the second category of the respondents voice that future EFL teachers' ICT competence is not sufficiently developed for teaching English as a foreign language. When we looked at the data in more detail to get a better understanding, we discovered that even teachers from the same university differ in their opinions on this question. The respondents' answers are very subjective. Therefore, it is not possible to draw a clear conclusion. This question is related to the first question in the study (are current curricula sufficient enough to develop future EFL teachers' ICT competence?). We suppose that if the curricula are not sufficient enough to develop future EFL teachers' ICT competence, the future EFL teachers' ICT competence is not sufficiently developed for teaching English as a foreign language and vice versa. When we compared the answers to this question with those of the first question in the study, we found out that the results are in line with our expectations.

All the respondents believe that all the following topics are important and should be included in the university studies, namely:

a. Training in using ICT for motivating students

b. Training in using ICT for introducing new learning materials

c. Training in using ICT for the fixation of knowledge

d. Training in using ICT for testing acquired knowledge and skills

e. Training in using ICT for teaching management

f. Training in using ICT for cooperation and communication between institutions, colleagues, teachers and students

g. Training in basic ICT skills

h. Training in the trends of education and in incorporating ICT in teaching English as a foreign language.

However, as the research data show, not all universities have these topics in their curricula.

Another notable quality shows up when we evaluate the question that focuses on teaching literature with the help of e-books. The respondents are reluctant to use e-books in primary school. This can be clearly seen in the comments, e.g., "Those in grade 1-5 is too young to use e-books, but for those in grade 6-9, I partially agree. But there should be an equal distribution of time in using e-books and real books." or "But it is important to build up a relationship with real books (printed books) first, and then afterwards, they can use e-books."

Based on the results, we can proceed to accept or refute research assumption 3. In this case, however, the results are inconclusive as there were two groups of teachers with two different views — one group firmly believes that the curricular design of the programs to prepare future EFL teachers for the development of ICT competence is sufficient, the other group does not believe this. If we analyze the research data more closely, we find that there are contradicting views within the individual universities as well. The fact that respondents would be satisfied at one university and not at another one cannot be stated. So the respondents' answers are very subjective. Therefore, it is not possible to draw a clear conclusion.

Regarding research assumption 4, the research results do not confirm that university teachers believe that training in using ICT for introducing new learning materials is included to a greater extent in university studies than training in other ICT competencies. Respondents are of the opinion that other areas such as training in using ICT for motivating students; training in using ICT for the fixation of knowledge; training in using ICT for testing acquired knowledge and skills; training in using ICT for teaching management; training in using ICT for cooperation and communication between institutions, colleagues, teachers and students; training in basic ICT skills; training in the trends of education and in incorporating ICT in teaching English as a foreign language are equally represented.

4.3   Research Limitations

The research results and conclusions are of course limited. Although we tried to reflect the results in an international context in our theoretical analyses, the study is only carried out in the Czech Republic and partially in Slovakia. Therefore, the results and conclusions cannot be automatically transferred to other countries without prior validation.

From a quantitative point of view, the limitation is due to the relatively small number of respondents, which is due to the focus of the study on preparing teachers of English language and literature at universities. In the Czech Republic and Slovakia, it is typically the case that the departments preparing these teachers are in fact smaller organizational units of the faculties.

The fact that this is not a longitudinal study, but that data was collected only once, means that the results are restricted. Nevertheless, we managed to record the point in time at which the preparation of future English teachers took place under the old and partly new accreditation so that we were able to follow the development trends.

As a rule, conclusions from researching can only apply to the environment in which we collected our data. So it is a preview of only a fraction of the reality of education.

5 CONCLUSION

Digital technologies have greatly influenced teaching and learning, and many studies have shown that they can positively influence the outcomes of education. The trend of integrating ICT in the educational fields is irreversible. Moreover, integration of technology in education requires new competence of teachers (Zhu, 2010). Teachers are expected to be able to integrate digital technology in teaching. Teachers must be digitally competent, otherwise effective integration of ICT in education cannot be achieved (Dostál et al., 2017b). Our thesis focuses on professional preparation of future EFL teachers' ICT competence and its development. The findings from our research give insights to teacher educators and policy makers to make better decisions.

The main limitation of our research is its sample size of teachers. Further studies need to include larger samples of teachers at all levels of foreign language instruction so as to ensure a more comprehensive understanding of the current situation and of what work still needs to be done. Furthermore, there are many factors leading to the unsufficient ICT competence of future EFL teachers. This research does not cover all factors. It only focuses on curriculum improvement as a method for the development of future EFL teachers' ICT competence. Future studies should be carried out to investigate other ways for the development of future EFL teachers' ICT competence.

5.1   Fulfilment of the Objectives of the Dissertation

For the sake of clarity, we would like to conclude by discussing the fulfilment of objectives of the dissertation. **The aim of the dissertation was to expand the theories of pedagogy and to implement an empirical research survey which will provide valuable information for the improvement of pre-service EFL teacher training.**

This goal is achieved as follows:

- By description, explanation and comparative analysis of theoretical knowledge, their synthesis and evaluation, in order to create a basis for the empirical and applied outputs of the dissertation. The results are primarily presented in chapter 1 and chapter 2.

- By applying research-based analysis of the university courses syllabi focusing

on the development of future EFL teachers' ICT competence. The results are presented in Chapters 3 and 4.

- By interviewing university professors and getting their opinions. The results are presented again in Chapters 3 and 4.

Despite the unfavourable framework conditions caused by the COVID-19 pandemic, all goals have been successfully achieved.

5.2   Recommendations

The research results indicate important facts for educational practice and theory:

- Universities should have curricula regarding ICT in teaching specific for future EFL teachers. And the curriculum should be well-organized. It should not only focus on technological knowledge training but also technological pedagogical content knowledge training. It means the effective use of ICT in English language teaching.

- The curriculum should be updated according to the reality of schools . As one teacher educator (Teacher 6) said in the interview, the interactive whiteboard they use in teaching future EFL teachers is not that embedded in real schools. Theirs is old fashion. When future EFL teachers work in real schools, they will feel difficult to adapt to the advanced interactive whiteboards immediately.

- Universities should systematically address HR issues and recruit good teachers with the appropriate skills. Only a teacher who has these competencies can pass them on. University teachers must be trained in the field of university education with a focus on the use of modern technologies.

- Government should have awareness of the effectiveness of ICT in education, including English foreign language teaching and put efforts on developing EFL teachers' ICT competence. Policy makers at all levels (state, district and school) should play their roles in the support of developing a well-developed curriculum to develop further EFL teachers' ICT competence. Measures should be set out to help improve EFL teachers' ICT competence, in particular as regards knowledge and skills. Canada set a good example in this regard. The country makes good experiences to be shared around schools and universities .Good

evidence of ICT integration in teaching English should be shared among schools.

- University students who are set to become primary school teachers one day should take full advantage of the elective ICT courses to develop their competence.

- Account should be taken of continual development of EFL teachers' ICT competence because new technology emerges every day.

- In view of the rapid pace of technological development, theories are continuously being revised and expanded. This has partly been done in this dissertation, but should be continued on an international level.

5.3 Future Research

Through the course of the theoretical analyses and our own research, we have found out the positive aspects of ICT and its effectiveness on learning English by means of distance learning in the conditions we are living in now. We do not yet know the exact answer, one which was also revealed during the COVID pandemic. It is clear that teaching a small group of individuals or even one-to-one teaching can achieve high scores in terms of effectiveness. However, one has to question how effective online English lessons with whole classes are, i.e. with around 252 students. One has to question whether it is even possible to motivate all students doing distance learning with ICT technologies.

6 BIBLIOGRAPHY

1. Abuhmaid, A. (2011). ICT training courses for teacher professional development in Jordan. *Turkish Online Journal of Educational Technology*, *vol .10,* no. 4, pp. 195-210.

2. Akarsu, B., & Kaya, H. (2012). Redesigning effective methods courses: Teaching pre-service teachers how to teach. *Electronic Journal of Science Education 16(1)*, 1-16.

3. Akinde, O. A., Harr, D., & Burger, P. (2017). Field experience: Experiential learning as complementary to the conceptual learning for international students in a graduate teacher education program. *International Journal of Higher Education, 6(4),* 137-151.

4. Alberth, A. (2013). Technology-enhanced teaching: A revolutionary approach to teaching English as a foreign language. *TEFLIN Journal*, *24(1)*, 1-13.

5. Albirini, A. A. (2006). Teacher's attitudes toward information and communication technologies: the case of Syrian EFL teachers. *Journal of Computers and Education, 47*, 373-398.

6. Alenezi, A. (2015). Influences of the mandated presence of ICT in Saudi Arabia secondary schools. *International Journal of Information and Education Technology, 5(8)*, 638–644.

7. Alhinty, M. (2015). English-language learning at their fingertips: how can teachers use tablets to teach EFL children? *International journal of mobile and blended learning*. *V7 n2,* 45-63

8. Al Khateeb, A. A. M. (2017). Measuring digital competence and ICT literacy: An exploratory study of in- service English language teachers in the context of Saudi Arabia. *International Education Studies, 10(12),* 38-51.

9. Alzaidiyeen, N. J., Mei, L. L., & Fook, F. S. (2010). Teachers' attitudes and levels of technology use in classrooms: The case of Jordan schools. *International Education Studies, 3(2)*, 211–218.

10. Ananiadou, K. & Claro, M. (2009). 21st-century skills and competences for new millennium learners in OECD countries. Paper presented at the New Millennium Learners Conference, 21st Century Skills and Competencies, Brussels Department of Education.

11. Ardıç, Ö., & Çiftçi, H. (2019). ICT competence and needs of Turkish EFL instructors: The role of gender, institution and experience. *Eurasian Journal of Applied Linguistics, 5(1), 153-173*.

12. Ashraf, H., Motlagh, F. G., & Salami, M. (2014). The impact of online games on learning English vocabulary by Iranian (low-intermediate) EFL learners. *Procedia-Social and Behavioural Sciences, 98,* 286-291.

13. Aslan, A., & Zhu, C. (2017). Investigating variables to predict Turkish pre-service teachers' ICT integration into teaching practices. *British Journal of Educational Technology, 48(2),* 552–570.

14. Aslan, A., & Zhu, C. (2018). Starting teachers' integration of ICT into their teaching practices in the lower secondary schools in Turkey. *Educational Sciences: Theory & Practice, 18(1),* 23-45.

15. Bandono, A., Suharyo, O., & Mashudi, A. (2021). The diffusion of learning innovation based on electronic learning system (e-learning). *International Journal of Progressive Sciences and Technologies, 27(1),* 121-130.

16. Barak, M., Watted, A. & Haick, H. (2016). Motivation to learn in massive open online courses: Examining aspects of language and social engagement. *Computer & Education, 94,* 49-60.

17. Baran, E., Bilici, S., Sarı, A., & Tonduer, J. (2019). Investigating the impact of teacher education strategies on preservice teachers' TPACK. *Britisih Journal of Educational Technology*, *50(1),* 357-370.

18. Barrs, K. (2012). Fostering computer-mediated L2 interaction beyond the classroom. *Language Learning & Technology, 16(1)*, 10–25.

19. Barton, R. & Haydn, T. (2006). Trainee teachers' views on what helps them to use information and communication technology effectively in their subject teaching. *Journal of Computer Assisted Learning*, *22, 4*, 257–272.

20. Becker H. J. & Riel, M. M. (2000). Teacher professional engagement and constructivist compatible computer use [on-line]. Centre for Research on Information Technology and Organizations, University of California, Irvine. Available at: http://www.crito.uci.edu/tic/findings.html.

21. Benali, M., Kaddouri, M., & Azzimani, T. (2018). Digital competence of Moroccan teachers of English. *International Journal of Education and Development using ICT, 14(2)*.

22. BERA-RSA. (2014). *Research and the teaching profession: Building the capacity for a self-improving system.* Final report of the BERA-RSA inquiry into the role of research in teacher education. Oxford: BERA-RSA Inquiry into Research and Teacher Education. Accessed by 22, October, 2020. <https://www.thersa.org/globalassets/pdfs/bera-rsa-research-teaching-profession-full-report-for-web-2.pdf >

23. Billings, E., & Mathison, C. (2011). I get to use an iPod in school ? Using technology-based advance organizers to support the academic success of English Learners. *Journal of Science Education Technology, 21(4),* 494-503.

24. Bitter, G., & Meylani, R. (2016). The effect of an m-learning English speaking software App on students in the Chiang Rai Municipality schools 6 and 7 in Thailand. *International Journal for Innovation Education and Research. V4 n11*, 82-100.

25. Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). Taxonomy of educational objectives: The classification of educational goals. *Handbook I: Cognitive domain.* New York: David McKay Company.

26. Boulton, H. (2017). Exploring the effectiveness of new technologies: Improving literacy and engaging learners at risk of social exclusion in the UK. *Teaching and Teacher Education, 63*, 73–81.

27. Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal, 9(2),* 27-40.

28. Bransford, J., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school (Expanded ed.).* Washington, D.C.: National Academy Press.

29. Braun, V., & Clarke, V. (2012). Thematic analysis. *APA Handbook of Research Methods in Psychology. 2*, 57-71.

30. Bruce, B., & Levin, J. (2003). Roles for new technologies in language arts: inquiry, communication, construction, and expression. In J. Jenson, J. Flood, D. Lapp, & J. Squire (Eds.). *The handbook for research on teaching the language arts (2nd edition)*. NY: Macmillan.

31. Brun, M., & Hinostroza, J. E. (2014). Learning to become a teacher in the 21st century: ICT integration in Initial Teacher Education in Chile. *Educational Technology & Society*, *17* (3), 222–238.

32. Buabeng-Andoh, C. (2019). Factors that Influence teachers' pedagogical use of ICT in secondary schools: A case of Ghana. *Contemporary Educational Technology*, 10(3), 272-288.

33. Buč, S., & Divjak, B. (2015). Innovation diffusion model in higher education: Case study of E-Learning diffusion. Proceedings of the IADIS International Conference e-Learning, (pp. 205- 207). Las Palmas, Spain: IADIS International Association for Development of the Information Society. Available at: https://bib.irb.hr/datoteka/863764.Buc_Divjak_CECIIS_2016.pdf

34. Carretero, S., Vuorikari, R., & Punie, Y. (2017). DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use, EUR 28558 EN, doi:10.2760/38842.

35. Chaaban, Y., & Ellili-Cherif, M. (2017). Technology integration in EFL classrooms: A study of Qatari independent schools. *Education and Information Technologies., 22(5),* 2433–2454.

36. Chai, C.-S., Koh, J. H.-L., & Tsai, C.-C. (2013). A review of technological pedagogical content knowledge. *Educational Technology & Society*, *16(2),* 31–51.

37. Chen, R. J. (2010). Investigating models for pre-service teachers' use of technology to support student-centered learning. *Computers & Education*, *55(1)*, 32-42.

38. Chen, X. (2013). Tablets for informal language learning: student usage and attitudes. *Language Learning & Technology. Volume 17, Number 1,* 20–36.

39. Chen, Z., & Lee, S. (2018). Application-driven educational game to assist young

children in learning English vocabulary. *Journal of Educational Technology & Society, 21(1),* 70-81.

40. China' State Council. (2019). China Education Modernization 2035. Accessed by 1. October, 2021. <http://www.gov.cn/xinwen/2019-02/23/content_5367987.htm>

41. China's Ministry of Education. (2012). Ten-Year Plan of Educational Digitalization (2011-2020). Accessed by 20, October, 2019. <http://www.moe.gov.cn/srcsite/A16/s3342/201203/t20120313_133322.html>

42. Chráska, M. (2016). Metody pedagogického výzkumu: základy kvantitativního výzkumu. 2., aktualizované vydání. Praha: Grada. 254 stran. Pedagogika. ISBN 978-80-247-5326-3.

43. Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education*. Routledge. London and New York.

44. Colucci-Gray, L., Das, S., Gray, D., Robson, D., & Spratt, J. (2013). Evidence-based practice and teacher action-research: A reflection on the nature and direction of 'change'. *British Educational Research Journal, 39*, 126–147.

45. Correos, C. (2014). Teachers' ICT literacy and utilization in English language teaching, 'ICT & Innovations in Education'. *International Electronic Journal*, *2 (1)*, 1-25.

46. Couvaneiro, S., & Pedro. N. (2015). Collaborative learning using tablets in EFL to develop oral communication. In Proceedings of the 3rd International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM '15). Association for Computing Machinery, New York, NY, USA, 139–143. DOI:https://doi.org/10.1145/2808580.2808602

47. Cuestas, A, & Fazzi, V. (2012). The use of ICTs in the English class: An enriching experience. Puertas Abiertas (8). En Memoria Académica. Disponible en: http://www.memoria.fahce.unlp.edu.ar/art_revistas/pr.6019/pr.6019.pdf

48. Darling-Hammond, L. (2017). Teacher education around the world: what can we learn from international practice? *European Journal of Teacher Education*, *40:3*, 291-309.

49. Dashtestani, R. (2014). Computer literacy of Iranian teachers of English as a

foreign language: challenges and obstacles. *International Journal of Pedagogies and Learning, vol. 9, no. 1,* 87–100.

50. De Lima Guedes, K. K. (2020). Integrating MOOCs into traditional UK higher education: lessons learnt from MOOC-blend practitioners. In Borthwick, W., & Plutino, A. (Eds). *Education 4.0 revolution: transformative approaches to language teaching and learning, assessment and campus design* (pp.29-36). Research-publishing.net. https://doi.org/10.14705/rpnet.2020.42.1084

51. Digital Education Strategy to 2020. (2014). Available from https://stip.oecd.org/stip/policy-initiatives/2019%2Fdata%2FpolicyInitiatives%2F26747

52. Dostál, J., Wang, X., & Nuangchalerm, P. (2017a). Experiments in education supported by computer use: Teachers' attitudes towards computers. In proceedings of the 9th International Conference on Computer Supported Education (CSEDU2017), Volum 2, 248-254

53. Dostál, J. (2018). Teachers' key competences for ensuring inquiry based education. In V. Manolachi, C. M. Rus, S. Rusnac (eds.). *New Approaches in Social and Humanistic Sciences* (pp. 219-233). Iasi, Romania: LUMEN

    Proceedings. https://doi.org/10.18662/lumproc.nashs2017.18

54. Dostál, J., Wang, X., Steingartner, W., & Nuangchalerm, P. (2017b). Digital intelligence- new concept in context of future of school education. In: ICERI2017, pp.3706-3712. Seville, Spain.

55. Doyle, W. (1990). Case methods in the education of Teachers. *Teacher Education Quarterly.* Caddo Gap Press.

56. Dudáková, L. (2013). *Teaching English effectively with an interactive whiteboard.* Diploma thesis. Charles University in Prague.

57. Earle, R. (2002). The integration of instructional technology into public education: promises and challenges. *Educational Technology*, *42(1),* 5-13.

58. Ebrahimzadeh, M., & Alavi, S. (2017). Digital video games: E-learning enjoyment as a predictor of vocabulary learning. *Electronic Journal of Foreign Language Teaching. V14. N2,* 145-158.

59. e-CF (2014). European e-Competence Framework version 3. Available from http://www.ecompetences.eu/methodology.

60. Educational Testing Service (ETS). (2002). *Digital transformation: a framework for ICT literacy*. Princeton, NJ: Author.

61. Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: how knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education*, *vol. 42, no. 3,* 255–284.

62. Fereday, J. & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods, 5(1)*, 80–92.

63. Ferrari, A. (2012). *Digital Competence in Practice: An Analysis of Frameworks. JRC Technical Reports.* Institute for Prospective Technological Studies, European Union

64. FCIT. (2007). Technology integration matrix. Accessed by 23, Octerber, 2020.

    <http://fcit.usf.edu/matrix.>

65. Fosnot, C. T. (2005). *Constructivism: theory, perspectives, and practice*. Teachers College (2nd ed.). Columbia University.

66. Gilakjani, A. P. (2017). A review of the literature on the integration of technology into the learning and teaching of English language skills. *International Journal of English Linguistics, 7(5)*, 95.

67. Gobbo, C., & Girardi, M. (2001). Teachers beliefs and integration of information and communications technology in Italian schools. *Journal of Information Technology for Teacher Education, 10 (1 & 2)*, 63–86.

68. Gonda, Z. (2016). The ICT competence and development perspectives of teacher trainees during teaching practice. *Training and Practice, 14(3&4),* 215-231.

69. Griffiths, M. D. (2003). Video games: Advice for teachers and parents. *Education and Health*, *vol. 21, no. 3*, 48–49.

70. Guo, R. X. (2006). *Information and Communication Technology (ICT) literacy in teacher education: a case study of the University of British Columbia*. Doctoral Dissertation. The University of British Columbia.

71. Haddix, M. (2015). Preparing community-engaged teachers. *Theory Pract. 54,* 63–70.

72. Harfitt, G. (2018). The role of the community in teacher preparation: exploring a different pathway to becoming a teacher. *Front. Educ. 3:64.* 1-13.

73. Hassan, M., Rosnain, I. M., Ahmad, F. M. A., & Su, L. W. (2016). Teachers' acceptance of ICT and its integration in the classroom. *Quality Assurance in Education, 24(1),* 26-40.

74. Hausenblas, O. (2005). *Jak se učit.* In: Metodický portál RVP [online]. Praha: Národní ústav pro vzdělávání, 14. 01. 2013 [cit. 2018-06-08].

75. Hendl, J., & REMR, J. (2017). *Metody výzkumu a evaluace.* Vydání první. Praha: Portál. 372 stran. ISBN 978-80-262-1192-1.

76. Holmberg, J. (2016). Applying a conceptual design framework to study teachers' use of educational technology. *Education and Information Technologies, 22(5),* 2333–2349.

77. Honey, M., & Moeller, B. (1990). *Teachers' beliefs and technology integration: Different values, different understandings.* (Technical Report 6). New York: Center For Children and Technology.

78. Inan, F. A., & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development, 58(2)*, 137–154.

79. İşler, C., & Yıldırım, Ö. (2018). Perceptions of Turkish pre-service EFL teachers on their technological pedagogical content knowledge. *Journal of education and future. Issue: 13*, 145-160.

80. ISTE. (2016). International Society for Technology in Education. Available from https://www.iste.org/iste-standards.

81. Jahanban-isfahlan, H., Tamjid, N. H., & Seifoori, Z. (2017). Educational technology in Iranian high schools: EFL teachers' attitudes, perceived competence, and actual use. *Education Research International*, *volume 2017*, 1-9. https://doi.org/10.1155/2017/9738264

82. Jamalvandi, B., Sadeghi, H., & Soleimani, H. (2017). Computer assisted language

learning and EFL leachers' literacy: A case in Iran. *International Journal of English Linguistics*. *Vol. 7, No. 1,* 201-214.

83. Katwibun, H. (2014). Using an interactive whiteboard in vocabulary teaching. *Procedia–Social and Behavioral Sciences, 116,* 674-678. http://dx.doi.org/10.1016/j.sbspro.2014.01.278

84. Kamalodeen, V. J., Figaro-Henry, S., Ramsawak-Jodha, N., & Dedovets, Z. (2017). The development of teacher ICT competence and confidence in using Web 2.0 tools in a STEM professional development initiative in Trinidad. *Caribbean Teaching Scholar, Vol. 7,* 25–46.

85. Kee, A. N. (2012). Feelings of preparedness among alternatively certified teachers: What is the role of program features? *Journal of Teacher Education, 63 (1)*, 23–38.

86. Keeler, C. G. (2008). When curriculum and technology meet: Technology integration in methods courses. *Journal of Computing in Teacher Education, 25*, 23–30.

87. Khawaji, S. A. N. (2016). English teacher's perception and practices towards technology implementation*. International Journal of Language and Literature, 4(2),* 123-133.

88. Koc, M. (2011). Let's make a movie: Investigating pre-service teachers' refections on using video-recorded role playing cases in Turkey. *Teaching and Teacher Education, 27(1)*, 95–106.

89. Koçoğlu, Z. (2009). Exploring the technological pedagogical content knowledge of preservice teachers in language education. Paper presented at World Conference on Educational Sciences 2009. *Procedia Social and Behavioral Sciences 1*, 2734–2737.

90. Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education, 9(1)*, 60-70.

91. Kothari, C. R. (2004). *Research methodology: methods and techniques*. New age international(p) Ltd., Publishers.

92. Kopcha, T. J. (2010). A systems-based approach to technology integration using

mentoring and communities of practice. *Educational Technology Research and Development, 58(2),* 175–190. DOI: 10.1007/s11423-008-9095-4

93. Korat, O., Levin, I., Atishkin, S. & Turgeman, M. (2014). E-book as facilitator of vocabulary acquisition: Support of adults, dynamic dictionary and static dictionary. *Reading and Writing, 27(4)*:613-629.

94. Kruse, S. D., Louis, K. S., & Bryk, A. (1995). An emerging framework for analyzing school-based professional community. In K. S. Louis & S. D. Kruse (Eds.), *Professionalism and Community: Perspectives on Reforming Urban Schools* (p. 23–42). Thousand Oaks, CA: Corwin Press. Adapted/reprinted by permission of Corwin Press. All rights reserved.

95. Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research, 77,* 575–614. https://doi.org/10.3102/0034654307309921

96. Liu, T., & Chu, Y. (2010). Using ubiquitous games in an English listening and speaking course: Impact on learning outcomes and motivation. *Computers & Education, 55(2)*, 630-643.

97. Lowe, A., Norris, A. C., Farris, A. J., & Babbage, D. R. (2018). Quantifying thematic saturation in qualitative data analysis. *Field Methods*. *30 (3):* 191–207. doi:10.1177/1525822X17749386. ISSN 1525-822X. S2CID 148824883.

98. Luo, Y.-F., & Yang, S. C. (2016). The effect of the interactive functions of whiteboards on elementary students' learning. *Journal of Educational Computing Research*. *Vol. 54(5)*, 680–700

99. Makhlouf, K., & Bensafi, Z. (2021). An exploration of factors influencing teachers' attitudes toward the use of Information and Communication Technology (ICT) in classroom practice: A case study of secondary school EFL teachers in the Western District of Chlef , Algeria. *Advances in Language and Literary Studies, 12(2)*, 37-49. doi:http://dx.doi.org/10.7575/aiac.alls.v.12n.2.p.37

100. Malinina, I. (2015). ICT competencies of foreign languages teachers. *Social and Behavioral Science, 182*, 75-80.

101. Mandl, H., & Krause, U. M. (2003). Learning competence for the knowledge

society. In N. Nistor, S. English, S. Wheeler & M. Jalobeanu (Eds.), *Toward the virtual university: International online perspectives, 65-86.* Greenwich, CT: Information Age Publishing.

102. Marešová, H., & Klement, M. (2012). ICT kompetence učitelů a vzdělávání v informačním věku. In *Kvalita ve vzdělávání: Sborník příspěvků z XX. výroční konference České asociace pedagogického výzkumu* Praha: Karlova Univerzita, s. 664 - 675. 2012. ISBN 978-80-7290-620-8

103. Martin, A. (2006). A European framework for digital literacy. *Nordic Journal of Digital Literacy, 1,* 151-161.

104. McMahon, G. (2009). Critical thinking and ICT integration in a Western Australian secondary school. *Journal of Educational Technology Society, 12(4)*, 269–281.

105. Mehan, H. (1989). Microcomputers in classrooms: Educational technology or social practice? Anthropology & Education. *Quarterly, 20(1)*, 4-22.

106. Methodology of e-CF. (n.d.). Accessed 4 November. https://itprofessionalism.org/about-it-professionalism/competences/e-cf-overview/methodology-of-the-e-cf/

107. Ministry of Education, Youth and Sports of the Czech Republic. (2014). Strategy for education policy in the Czech Republic until 2020. Accessed by 21, October, 2020. Available from

    http://www.vzdelavani2020.cz/images_obsah/dokumenty/strategy_web_en.pdf

108. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge : A new framework for teacher knowledge. In *Teachers College Record 108 (6).* [s.l.] : Teachers College, Columbia University, pp. 1017-1054. Available from WWW: <http://punya.educ.msu.edu/writings/publications/>.

109. Mulhim, E. (2013). The current use of ICT by novice female teachers in Saudi primary schools and their perceived training needs. 30th ASCILITE Conference. Macquerie University, Sydney.

110. National Council for Accreditation of Teacher Education (NCATE). (2010). Transforming teacher education through clinical practice: A national strategy to prepare effective teachers. Retrieved from http://www.ncate.org/.

111. Nikolopoulou, K., & Gialamas, V. (2015). Barriers to the integration of computers in early childhood settings: teachers' perceptions. *Education and Information Technologies, 20(2)*, 285–301.

112. Nishanthi, R. (2018). The importance of learning English in today world. *International Journal of Trend in Scientific Research and Development, Volume-3(Issue-1)*, 871–874. https://doi.org/10.31142/ijtsrd19061

113. NUV. (2018). *Revize RVP v oblasti informatiky a informačních a komunikačních technologií.* Praha. Available from: http://www.nuv.cz/t/revize-rvp-ict

114. OECD. (2019a). OECD future of education and skills 2030: OECD learning compass 2030. Available from www.oecd.org/education/2030-projec

115. OECD. (2019b). *A Flying Start: Improving Initial Teacher Preparation Systems*, OECD Publishing, Paris, https://dx.doi.org/10.1787/cf74e549-en.

116. OECD (2005). Definition and selection of key competencies: executive summary. OECD. Available from https://www.oecd.org/pisa/35070367.pdf.

117. Ödalen, J., Brommesson, D., Erlingsson, G., Schaffer, J & Fogelgren, M. (2019). Teaching university teachers to become better teachers: the effects of pedagogical training courses at six Swedish universities. *Higher Education Research & Development, 38:2*, 339-353, DOI:10.1080/07294360.2018.1512955.

118. Öz, H. (2015). Assessing pre-service English as a foreign language teachers' technological pedagogical content knowledge. *International Education Studies*, *8*, 119–130.

119. P21. (2019). Partnership for 21st century skills. Accessed by 22, October, 2020.

    <http://static.battelleforkids.org/documents/p21/P21_Framework_Brief.pdf.>

120. Peeraer, J., Petegem, P.V. (2015). Integration or transformation: Looking in the future of information and communication technology in education in Vietnam. *Evaluation and Program Planning, 48(8),* 47–56.

121. Petelin, A., Galustyan, O., Prosvetova, T., Petelina, E., & Ryzhenkov, A. (2019). Application of educational games for formation and development of ICT competence of teachers. *International Journal of Emerging Technologies in Learning (IJET), 14(15),* 193-201.

122. Piaget, J. (1954). *The construction of reality in the child (M. Cook, Trans.)*. New York: Basic Books.

123. Puentedura, R. (2006). Transformation, technology, and education. Accessed by May 2019. < www.hippasus.com/resources/tte/>

124. Puentedura, R. (2014). SAMR: A contextualized introduction. Retrieved from http://hippasus.com/rrpweblog/archives/2014/01/15/SAMRABriefContextualized Introduction.pdf

125. Punie, Y. & Cabrera, M. (Eds.) (2006). *The future of ICT and learning in the knowledge society.* Luxembourg: European Commission.

126. Rao, A. (2013). What's the difference between "using technology" and "technology integration"? From http://teachbytes.com/2013/03/29/whats-the-difference-between-using-technology-and-technology-integration/ Erişim: 21.09.2014.

127. Rasiah, R.R. (2014). Transformative higher educational teaching and learning: using social media in a Team –Based Learning Environment. *Procedia – Social and Behavioral Sciences 123,* 369-379.

128. Razak, N.A., Lubis, M.A., Embi. M.A., & Mustapha, R. B. (2010). IT literacy of language teachers in Malaysian technical schools. *International Journal of Education And Information Technologies*. *issue 3, volume 4*, 149-156.

129. Redecker, C. (2017). European framework for the digital competence of educators: DigCompEdu. Punie, Y. (ed). EUR 28775 EN. Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-73494-6, doi:10.2760/159770, JRC107466.

130. Reid-Martinez, K., & Grooms, L. D. (2021). Constructivism in 21st century online learning. In M. Khosrow-Pour (Ed.), Handbook of research on modern educational technologies, applications, and management (pp. 730-743). IGI Global. http://doi:10.4018/978-1-7998-3476-2.ch045

131. Richardson. V. (2001). Teaching: trends in research. In Smelser. N.J., Baltes. P. B. (editor-in-chief). *International Encyclopedia of the Social and Behavioral Sciences*. 1st edition. Pergamon: Elsevier. pp. 15483-15487.

132. Roberts-Hull, K., Jensen, B., & Cooper, S. (2015). A *new approach: Teacher*

education reform. Learning First, Melbourne, Australia.

133. Roblyer, M. D. (2006). Planning and implementation for effective technology integration. In M. D. Roblyer & J. Edwards (Eds.), *Integrating Educational Technology into Teaching*. Available from http://coe.winthrop.edu/Educ275/06_ROLO/PRES_ FULL_Planning.pdf. Erişim: 10.01.2016.

134. Rogers. E.M. (2003). *Diffusion of innovations*. 5th edition. New York: Free Press.

135. Rogers, E.M. (1962). *Diffusion of Innovations*. New York: Free Press.

136. Røkenes, F. M., & Krumsvik, R. J. (2016). Prepared to teach ESL with ICT? A study of digital competence in Norwegian teacher education. *Computers & Education, 97*, 1–20.

137. Rozelle, J. J., & Wilson, S. M. (2012). Opening the black box of field experiences: How cooperating teachers' beliefs and practices shape student teachers' beliefs and practices. *Teaching and Teacher Education, 28(8)*, 1196-1205. http://dx.doi.org/ 10.1016/j.tate.2012.07.008.

138. Rychen, D. S., & Salganik, L. H. (Eds) (2003). *Key Competencies for a Successful Life and a Well-Functioning Society*. Cambridge. MA: Hogrefe & Huber.

139. Rychen, D.S. (2016). *Education 2030: Key competencies for the future.* OECD Education Policy Committee. Available from

   https://www.oecd.org/education/2030/E2030-CONCEPTUAL-FRAMEWORK-KEY-COMPETENCIES-FOR-2030.pdf

140. Samak, Z. A. (2006). *An exploration of Jordanian English language teachers' attitudes, skills, and access as indicator of information and communication technology integration in Jordan*. Doctor degree thesis. The Florida State University.

141. Sampson D., & Fytros, D. (2008). Competence models in technology-enhanced competence-based learning. In H. H. Adelsberger, Kinshuk, J. M. Pawlowski, D. Sampson (Eds.), *Handbook on Information Technologies for Education and Training* (2nd ed). Springer.

142. Sana, F., Weston, T., & Cepeda, N.J. (2013). Laptop multitasking hinders classroom

learning for both users and nearby peers. *Computer &education, 62*.24-31.

143. Shapley, K. S., Sheehan, D., Maloney, C., & Caranikas-Walker, F. (2010). Evaluating the implementation fidelity of technology immersion and its relationship with student achievement. *The Journal of Technology, Learning and Assessment, 9(4)*.4-69. Retrieved from https://ejournals.bc.edu/index.php/jtla/article/view/1609

144. Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, *15 (2)*, 4-14.

145. Sipila, K. (2014). Educational use of information and communications technology: Teachers' perspective. *Technology, Pedagogy and Education, 23(2)*, 225-241.

146. Slavin, R. E. (2003). *Education psychology: Theory and practice*. Boston: Allyn &Bacon.

147. Smith, B. L., & MacGregor, J. (1992). *Collaborative learning: A sourcebook for higher education*. University Park, PA: National Center on Post secondary Teaching, Learning, and Assessment (NCTLA).

148. Solak, E., & Cakir, R. (2014). Examining preservice EFL teachers' TPACK competencies in Turkey. *Journal of Educators Online, 11,* 1–22.

149. Son, J. B., Robb, T., & Charismiadji, I. (2011). Computer literacy and competency: A survey of Indonesian teachers of English as a foreign language. *CALL-EJ*, *12(1),* 26-42.

150. STAG. (2020). https://stag.upol.cz/portal/

151. Sysoyev, P. V., & Evstigneev, M. N. (2014). Foreign language teachers' competency and competence in using information and communication technologies. S*ocial and Behavioral Science, 154,*82-86.

152. Sysoyev, P. V., & Evstigneev, M. N. (2015). Foreign language teachers' competency in using information and communication technologies. *Procedia-Social and Behavioral Sciences*, *200,*157-161.

153. Titova, S. (2012) Developing of ICT competence of language teachers through an online professional development course in Moodle. The 6th International Technology, Education and Development Conference Proceedings (IATED), pp.

4378-4385

154. Toledo, C. (2015). A five-stage model of computer technology integration into teacher education curriculum. *Contemporary Issues in Technology and Teacher Education, 5(2)*, 177-191.

155. Tondeur, J., Valcke, M., & Van Braak, J. (2008). A multidimensional approach to determinants of computer use in primary education: Teacher and school characteristics. *Journal of Computer Assisted Learning, 24(6)*, 494-506.

156. Tondeur, J., van Braak, J., Sang, G., Voogt, J., Fisser, P., & Ottenbreit-Leftwich, A. (2012). Preparing pre-service teachers to integrate technology in education: A synthesis of qualitative evidence. *Computers & Education, 59,* 134–144.

157. Toom, A., Kynäslahti, H., Krokfors, L., Jyrhämä, R., Byman, R., Stenberg, K., & Kansanen, P. (2010). Experiences of a research-based approach to teacher education: Suggestions for future policies. *European Journal of Education, 45*, 331–344.

158. Turgut, Y. (2017). Tracing preservice English language teachers' perceived TPACK in sophomore, junior, and senior levels. *Cogent Education*, *4(1),* 1368612.

159. Tülüce, H. S. (2016). Using the case story method in a teacher education practicum: Affordances and constraints. *Educational Sciences: Theory & Practice, 16*, 1275-1295.

160. Ulit, G. L., Bautista, T. A., Briones, A. C. D., Lindog, E. A., & Mordeno, V. C. (2020). Constructivism and pedagogical practices of English as a second language (ESL) teachers. *Ioer International Multidisciplinary Research Journal, Vol. 2, No. 4*, DEC., pp. 199-210.

161. Uluyol, C., & Sahin, S. (2016). Elementary school teachers' ICT use in the classroom and their motivations for using ICT. *British Journal of Educational Technology, 47(1),* 65-75.

162. UK Department for Education. (2019). Realizing the potential of technology in education: a strategy for education providers and the technology industry. Accessed by 21, October, 2020. < www.gov.uk/government/publications.>

163. UNESCO. (2011). UNESCO ICT competency framework for teachers. Assessed

by 22, September, 2019. <http://unesdoc.unesco.org/images/0021/002134/213475e.pdf>

164.U.S. Department of Education. (2010). National Education Technology Plan 2010: Transforming American Education Learning. Accessed by 19, October, 2020. <https://www.ed.gov/sites/default/files/netp2010-execsumm.pdf>

165.Ventura, R., & Quero, J. M. (2013). Using Facebook in university teaching: A practical case-study. *Procedia – Social and Behavioral Sciences*, *83,* 1032-1038.

166.Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teaching and Teacher Education, 24* (1), 80–91.

167.Vitanova, V., Atanasova-Pachemska, T., Iliev, D., & Pachemska, S. (2015). Factors affecting the development of ICT competencies of teachers in primary schools. *Procedia - Social and Behavioral Sciences*, *191*, 1087-1094. https://doi.org/10.1016/j.sbspro.2015.04.344.

168.Wahyuni, S., Mujiyanto, J., Rukmini, D., & Fitriat, S. W. (2019). Teachers᾽ technology integration into English instructions: SAMR model. International Conference on Science and Education and Technology (ISET 2019). pp. 546 – 550. DOI assehr.k.200620.109. ISBN 978-94-6252-979-3.

169.Wainwright, A. (2013). 8 studies show iPads in the classroom improve education. Accessed by 10, October, 2020. <http://www.securedgenetworks.com/secure-edge-networksblog/bid/86775/8-Studies-Show-iPads-in-the-Classroom-Improve-Education. Accessed 22 June 2014>

170.Wang, B. T., Teng, C. W., & Chen, H. T. (2015). Using iPad to facilitate English vocabulary learning. *Journal of Information and Education Technology, Vol. 5, No. 2,*100-104.

171.Wang, Q., & Woo, H. L. (2007). Systematic planning for ICT integration in topic learning. *Educational Technology & Society, 10(1),* 148-156.

172.Wang, Q. (2008). A generic model for guiding the integration of ICT into teaching and learning. *Innovations in Education and Teaching International, 45(4),* 411-419, DOI:10.1080/14703290802377307.

173. Wang, T. W. (2015). Does iPad technology bolster art teaching and learning? *Visual Inquiry: Learning & Teaching Art. Volume 4. Number 3,* 153-167

174. Wang, X., Dostál, J. & Aziz, A.K. (2020). The studies on English foreign language teacher's "ICT" - a review of literature. *Trends in education, (vol.13), issue 1*. 5-11 DOI:10.5507/tvv.2020.001

175. Warford, M. K. (2017). Educational innovation diffusion: confronting complexities. In A.M. Sidorkin, M.K. Warford (Eds.), *Reforms and Innovation in Education, Science, Technology and Innovation Studies,* DOI 10.1007/978-3-319-60246-2_2.

176. Weltman, D. (2007). *A Comparison of Traditional and Active Learning Methods: An Empirical Investigation Utilizing a Linear Mixed Model.* PhD Thesis, The University of Texas at Arlington.

177. Weinert, F.E. (1999). *Concepts of competence.* Contribution within the OECD project Definition and Selection of Competencies: Theoretical and Conceptual Foundations (DeSeCo). Muchen: Max Plank Institute for Psychological Research.

178. Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology, 25*, 116-119.

179. Wittrock, M. C. (1989). Educational psychology and the future of research in learning, instruction, and teaching. In M. C. Wittrock & F. Farley (Eds.), *The future of educational psychology* (pp. 75–89). Lawrence Erlbaum Associates, Inc.

180. Wong, K, T., Teo, T., & Russo, S. (2012). Influence of gender and computer teaching efficacy on computer acceptance among Malyasian student teachers: An extended technology acceptance model. *Australiasian Journal of Educational Technology, 28(7),* 1190-1207.

181. Yip, F. W. M., & Kwan, A. C. M. (2006). Online vocabulary games as a tool for teaching and learning English vocabulary. *Educational Media International, 43(3)*, 233–249.

182. Zhu, C. (2010). Teacher roles and adoption of educational technology in the Chinese context. *Journal for Educational Research Online, 2(2)*, 72-86.

183. Zezulková, L. (2017). *Engaging students with the interactive whiteboard in English Lesson*. Master's diploma thesis. Masaryk University.

7 APPENDIX 1

Questions for Interviewing with College and University Teachers

Part 1

1. Current curricula are sufficient enough to develop future EFL teachers' ICT competence.

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

Free response:

2) Do you consider using ICT in teaching English as a foreign language an asset?

1.–5. grade of the basic schools   yes   no

6.-9. grade of the basic schools   yes   no

Explain:

3. Which ICT competence needs to be improved for future EFL teachers?

      a) Application software for language teaching,

      b) Using social media for language teaching,

      c) Using digital learning resources for teaching,

      d) Other: ………………………………….

Free response:

4. What courses related to using ICT in teaching English as a foreign language are incorporated in current university curricula? Name them.

Free response:

5. There is a need to improve future English teachers' ICT competence

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

Free response:

6. What are the goals of developing ICT competence in the professional preparation of future EFL teachers?

Free response:

7. Future EFL teachers' ICT competence is sufficiently developed for teaching English as a foreign language.

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

Free response:

Part 2

8. Are the following items concerning training in ICT in teaching English as a foreign language covered in current university curricula? If so, point out the items.

If not, which of the following items do you think are necessary to be included in current curricula?

a) training in using ICT for motivating students

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

b) training in using ICT for introducing new learning materials

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

c) training in using ICT for the fixation of knowledge

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

d) training in using ICT for testing acquired knowledge and skills

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

e) training in using ICT for teaching management

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

f) training in using ICT for cooperation and communication between institutions, colleagues, teachers and students

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

i) training in basic ICT knowledge and skills

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

j) training in the trends of education and in incorporating ICT in teaching English as a foreign language

Strongly agree   Somewhat agree   Neither agree nor disagree

Somewhat disagree   Strongly disagree

Free response:

9) Do you consider it suitable to use children's literature e-books in teaching English as a foreign language?

1.–5. grade of the basic schools

Strongly agree   Somewhat agree
Neither agree nor disagree

Somewhat disagree   Strongly disagree

6.-9. grade of the basic schools

Strongly agree   Somewhat agree
Neither agree nor disagree

Somewhat disagree   Strongly disagree

Free response:

Part 3 INFORMATION ABOUT THE RESPONDENTS

Please indicate:

   a.   The length of experience in preparing future EFL teachers:
   b.   Country: Czech Republic   Slovak Republic
   c.   I carry out research or publish my research findings related to teaching
        English as a foreign language: YES   NO
   d.   Age:
   e.   Sex:

Thank you for your cooperation.