A Program Based on TPACK for Enhancing Prospective Teachers' EFL 21st Century Skills

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Abstract

The purpose of this research is to illustrate the effect of a program based on Technological Pedagogical and Content Knowledge (TPACK) to enhance prospective teachers' EFL 21st century skills at the faculty of Specific Education. The participants of the study consisted of 30 students divided into two groups: An experimental group of 15 students and the control one of 15students. The groups were randomly chosen from the EFL students at the Faculty of Specific Education, Zagazig University, Egypt. A program based on TPACK was used in teaching the experimental group, while the regular instruction was used in teaching the control one in the second term of the academic year 2022-2023. The study instruments were (a) an EFL 21st century skills checklist which was divided into four parts of EFL 21st century skills with their sub-skills including: critical thinking, creativity, communication and collaboration skills (4Cs), (b) an EFL 21st century test that was designed and validated to be used as a pre-posttest and (c) an observation sheet to observe whether the prospective teachers use the EFL 21st century skills (4Cs) in their teaching or not. Having administered the test and the observation sheet to both groups after the treatment. Data were collected and statistically analyzed. The results of the study revealed that the program based on TPACK had a large effect on developing EFL 21st century skills among prospective teachers of English Language.

Keywords: A program based on TPACK – EFL 21st century skills-prospective teachers of English –Specific Education, Egypt.

برنامج قائم علي تيباك TPACK

لتنمية مهارات القرن الواحد و العشرين للغة الإنجليزية لدي الطلاب المعلمين

الملخص العربي

هدف البحث الحالي إلى دراسة تأثير برنامج قائم على (تيباك)في تنمية مهارات القرن الواحد و العشرون للغه الانجليزية لدى طلاب معلمي اللغة الإنجليزية بكلية التربية النوعية جامعة الزقازيق. دراسة شبه تجريبية حيث قام الباحث بتقسيم عينة الدراسة إلى مجموعتين (مجموعة تجريبية ومجموعة ضابطة) تم اختيارهما بطريقة عشوائية من طلاب الفرقة الرابعة شعبة اللغة الإنجليزية، وكان عددهم 30 طالب وطالبة مقسمين إلى 15 طالب و طالبه في المجموعة التجريبية ودرسوا عن طريق البرنامج القائم على التيباك و15 طالب وطالبة في المجموعة الضابطة تم تدريسهم بالطريقة التقليدية وتم اختبار تلك المجموعتين قبل وبعد تطبيق البرنامج. وكانت أدوات الدراسة كالتالي: 1-اسبيان بمهارات القرن الواحد و العشرون 2- اختبار لاختبار مهارات القرن الواحد و العشرون و3- بطاقة ملاحظه لملاحظة الطلاب المعلمون اثناء القيام بعملية التدريس هل قاموا باستخدام مهارات القرن الواحد و العشرون ام لا . وكانت نتائج الدراسة كالتالي: يوجد فروق ذات دلالة إحصائية بين المجموعتين التجريبية والضابطة في التطبيق البعدي لمهارات القرن الواحد و العشرون لصالح المجموعة التجريبية نتيجة للتدريس باستخدام البرنامج القائم على التيباك.

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Introduction:

With the prevalence of digital and multimedia technologies in today's linked world, communication is becoming more and more essential to our everyday lives and duties. It is true that this technology facilitates peer-to-peer collaboration and communication, which helps students express their opinions, critically analyze texts, and use creativity to solve challenges (Cruz, 2011).

Technology has grown in significance in students' lives outside of the classroom, and it may also improve their comprehension of difficult subjects and promote peer collaboration in the classroom. The education sector is among the many professional development and practice domains that face new problems as a result of the current technology's rapid expansion. One of the challenges in the present technological era is implementing new or creative technologies in the classroom. To address the demands of learners, however, adopting technology alone won't be sufficient. The ability of teachers to use technology into their lessons can act as a link to help students reach their full potential (Khan, 2014).

According to (Altun and Akyildiz, 2017), the education sector is crucial in preparing societies for a work climate that is heavily reliant on technology. As a result, there has been careful consideration given to incorporating technology into the classroom to improve teaching and learning outcomes. As a result, encouraging teachers' professionalism through information and communication technology (ICT) integration in the classroom might be beneficial. This idea is supported by (Khan, 2014), which offers a model based on (TPACK) as a part of the professional development of teachers in Bangladesh.

Every teacher (pre-service or in-service) has his own method of teaching. They are all educators, but this research concentrates on how effective they are and how they might become even more successful in their classroom management to enhance the 21ˢᵗ century skills via a program based on TPACK. It appears that in order to engage students in a better learning environment and help them learn more successfully, teachers need to improve their techniques of instruction within the classroom. The researcher aimed to utilizing a program based on TPACK to enhance EFL 21ˢᵗ century skills among prospective teachers at the faculty of Specific Education, Zagazig University.

(Mishra & Koehler, 2006) illustrated a TPACK framework provides a useful solution to many of the challenges that instructors have while integrating educational technology (Edtech) in their classrooms. The framework focuses on technical knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). The TPACK framework describes the content, what is being taught, and pedagogy. They are the cornerstones of any successful Edtech integration by distinguishing between these three forms of knowledge. This arrangement is crucial because it improve student learning requires that the technologies being used both complement and convey the pedagogy.

As per the TPACK framework, it is optimal to employ certain technical instruments (hardware, software, apps, related information literacy practices, etc.) to educate and mentor students towards more comprehensive and comprehension of the subject matter. Thus, within the TPACK framework, the three categories of knowledge—TK, PK, and CK—are integrated and recombined in different ways. While pedagogical content knowledge (PCK) describes the same relationships and interactions between pedagogical practices and specific learning objectives, technological content knowledge (TCK) describes the relationships and intersections between technologies and learning objectives. Technological pedagogical knowledge (TPK) describes the relationships and interactions between technological tools and specific pedagogical practices. TPACK, which takes into account the connections between all three sectors and recognizes that educators are working in this complicated environment, is therefore made up of these triangulated domains.

Highly trained instructors are the goal of 21st century teacher education programs (Cohan, A., & Honigsfeld, 2011; Gore, Griffiths, & Ladwig, 2004; Rots, et.al. 2010). At all educational levels, preparing prospective teachers to be outstanding educators is the main objective of teacher education (Gore et al., 2004). Because their performance is always linked to their pupils' academic success, qualified instructors are essential (Cohan & Honigsfeld, 2011). A lot of criticism of the quality of teacher education is focused on the way in which instructors were trained and educated at their own institution, since not all programs produced competent teachers.

The increasing focus of how instruction techniques and classroom practices affect learners' behavioral growth and academic achievement has an effective basis. It has been proven that instructional quality has a greater correlation with student learning than school structural

characteristics, both in developing (Yoshikawa and Kabay, 2015) and Western (Pianta et al., 2009) countries (Chavan and Yoshikawa, 2013; Patrinos et al., 2013). However, the range of skills required to provide pupils with high-quality instruction and learning requires the acquisition of critical competencies and skills beyond reading and numeracy—also known as 21st century skills.

Critical thinking, problem solving, creativity, metacognition, communication, digital and technological literacy, civic responsibility, and global awareness are among the competencies commonly considered to be also as a part of the 21st century skills (Dede, 2010 for a review of frameworks). The development of such competences more crucial rather than in the contexts of emerging nations, where there has been a noticeable lack of progress in learning outcomes, indicating the urgency of the need to enhance the quality of instruction. Lack of relevant means to help teachers in their professional development and a context-specific knowledge of teaching practices are obstacles to achieving the required changes (Seidman et al., 2018; UNESCO, 2016; Wolf et al., 2018). That is, how can we help teachers develop 21st -century skills so that they can assist in producing 21st century learners?

Hence, developing EFL prospective teachers' 21st century skills may become completely competent in-service EFL teachers, their technical proficiency relevant to their instruction is essential. The efficient integration of technology into the teaching and learning process is the focus of the TPACK framework (Kozikoglu & Babacan, 2019). Additionally, it could lessen the issues with limited personnel, software, and hardware in the classroom. Later on, these pre-service EFL instructors will use this framework to help their students grow in their knowledge, abilities, and experience by thinking about how to integrate technology, content, and proper pedagogy. The next generation of in-service teachers can benefit from innovative curriculum and instructional strategies developed by well-prepared preservice teachers (Kwangsawad, 2017). So, this research aims to enhance prospective teachers' EFL 21st century skills via a program based on TPACK**.**

1.2. Context of the Problem:

The problem of this study was emerged from several resources:

First, there were studies that showed if there was insufficient EFL 21st century skills such as (Chen, 2021). The researcher observed that the EFL prospective teachers at the faculty of Specific Education, Zagazig University, Egypt had difficulties on some of the EFL 21st century skills as they couldn't think critically, haven't creativity in their teaching via field training program, couldn't communicate effectively with pupils in

the classroom and couldn't collaborate with their peers during teaching practice.

Second, In order to identify the problem more precisely, the researcher carried out a pilot study during the second semester of the academic year 2022/2023 using EFL fourth-year students at Zagazig University's Faculty of Specific Education (n = 20). In order to collect data on the EFL 21st century skills requirements for fourth year students, a test was administered. The results of the EFL 21st century skills test revealed that the percentage of the students 'responses to test questions was less than 50%. Table (1) shows the percentage of the students 'responses to each EFL 21st century skills.

Table (1). Results of the pilot EFL 21st century skills

EFL 21st century skills	Percentage
Critical Thinking	23%
Creativity	25%
Communication	27%
Collaboration	25%

Based on the results of the pilot study, it could be concluded that the EFL prospective teachers at the faculty of Specific Education lacked the EFL21st century skills (4Cs) and it was observed that the current study aimed to develop these skills by using a program based on TPACK.

1.3. Statement of the Problem:

From the above mentioned results of the pilot study and after reviewing the relevant literature and some previous studies, it can be stated that the EFL prospective teachers lack some EFL 21st century skills. Thus, the aim of this research was to enhance the necessary EFL 21st century skills via a program based on TPACK**.** Thus the problem of this study can be summarized in this main question as followed:

"What is the effect of a TPACK Based Program on Enhancing Prospective Teachers' EFL 21st Century Skills?"

There are some sub-questions can be derived from this main question as follows:

1- What are the necessary EFL 21st century skills needed by prospective teachers at the faculty of Specific Education?
2- To what extent do the prospective teachers have these EFL 21st century skills?
3- What are the main features of a TPACK based program**?**
4- To what extent does the program enhance the prospective teachers' EFL 21st century skills?

5- How does the program effect on prospective teachers' teaching practice?

6- Is the program based on TPACK effective in enhancing prospective teachers' EFL 21st century skills?

1.4. Study Hypotheses:

In order to fulfil the study's purpose, the following hypotheses were formulated:

1. There would be a statistically significant difference between the mean scores of the control group and those of the experimental group on overall EFL 21st century skills in favor of the experimental group.

2. There would be a statistically significant difference between the mean scores of the control group and those of the experimental group on each of EFL 21st century skills in favor of the experimental group.

3. There would be a statistically significant difference between the mean scores of the control group and those of the experimental group on overall dimensions of EFL 21st century skills observation sheet in favor of the experimental group.

4. There would be a statistically significant difference between the mean scores of the experimental group on overall dimensions of EFL 21st century skills pre-post observation sheet in favor of the post observation sheet.

5. A program based on TPACK has a large effect in improving EFL 21st century skills among prospective teachers.

1.5. The Aim of the Study:

This study aimed to:

Develop some EFL 21st century skills (critical thinking, creative thinking, communicating, and collaborating) among prospective teachers of English Language at the Faculty of Specific Education through a program based on TPACK.

1.6. Significance of the Study:

The study hoped to be significant to:

a. **English language instructors:** this study can assist instructors in comprehending and implementing a program based on TPACK to practice and enhance EFL 21st century skills.

b. **The EFL Prospective Teachers:** Such students may be able to enhance their 21st century skills as a result.

c. **Curriculum Developers and Designers:** This study might offer a fresh method for exercising and enhancing EFL 21st century skills to curriculum developers and designers.

1.7. Study Delimitations:

The ensuing boundaries were taken into consideration:

- The study was delimited to EFL prospective teachers at the faculty of Specific Education, Zagazig University, Egypt (n=30).
- Some EFL 21st century skills including (critical thinking, creativity, communication, and collaboration).
- Second semester of the academic year 2022-2023

2. Review of Literature

The EFL 21st Century Skills (4Cs):

The needs of students are always changing, and foreign language (FL) instruction in the 21st century needs to keep up with these changes in order to provide students with the necessary tools for successful functioning in the modern world. Significant changes in language learning and teaching methods, as well as communication, have been brought about by globalization and digitization (Fandiño 2013; Faulkner & Latham 2016).So language education in the twenty-first century, according to Eaton (2010), is consequently focused on using language and cultural knowledge to communicate and connect with people throughout the world. It has been suggested that instead of focusing only on language instruction, FL schools should develop a wide range of abilities that will enable their pupils to flourish in a variety of scenarios. Although these talents have gone by a number of names, Saavedra and Opfer (2012) point out that the term "21st century skills" is the most widely used and recognized globally.

The analysis of the related studies indicates that 21st century skills is a very broad concept that correlated with mental processes that include creativity, problem solving, decision making, self-knowledge, critical thinking, and gathering and analyzing information. Learning and employability skills including communication, collaboration, time management, ICT literacy, agility, and flexibility may also be included. Finally, social skills as citizenship, responsibility, cultural awareness have also been identified among 21st century skills (Voogt & Roblin 2010).

The 4Cs (critical thinking, creativity, communication and collaboration) are the main emphasis of this study of the EFL 21st century skills. Because they aid in learning, these skills are essential for academic achievement beyond. It is important for student teacher to understand and know the core ideas that inform all instruction in content. These significant concepts, which are connected to other essential standards, include the instruction, the nature of the learner, school governance and culture, theories of learning and development,

crucial implementation of technology, and an awareness of how the arts impact and interact with all other content areas and students' evaluation. Additionally, potential instructors need to have the knowledge and abilities necessary for organizing their time, planning, assigning tasks, and making purchases of supplies and equipment (NCDCPI, 2009).

Effective teaching skills such as "subject matter knowledge, motivation, communication, and behavior management skills" are also expected of the student teacher (Olaitan & Agusiobo, 1981). (Hascher, Cocard, and Moser, 2004) asked effective teachers and communication teachers to assess pre-service teachers' professional progress in practice courses. Their evaluations, illustrated that student teachers' learning increases and enhances in practical sessions.

Several studies such as (Canbazolu, 2008; Simmons et al., 1999; Veal, Tippins & Bell, 1998) have demonstrated that student teachers encounter difficulties while attempting to translate their subject knowledge into a format that is understandable to students during their initial years of teaching. The necessity of practicing teaching courses every day is increased by the difficulties in aligning theory with practice (Power, Clarke & Hine, 2002; Sinclair, 1997; cited in Ba3türk, 2009). (Dewey's,1904; cited in Mewborn,1999) illustrated that the main goal of student teachers programs should be to support preservice teachers in reflecting on practice-related issues. Thus, identifying the issues that student teachers face when putting their teaching skills into practice, assessing the theoretical and practical instruction that candidates receive throughout their education, and assessing the needs of candidates are crucial in order to take the appropriate action.

Due to pupils' extensive exposure to digital technology and their high level of proficiency with it, teaching in 21st-century classrooms has become an increasingly complicated and challenging profession (Altun & Akyildiz, 2017, p. 468).As a result, instructors are essential in educational environments because they are expected to appropriately and successfully use technology into their lessons.

Teachers may improve their teaching by utilizing the technical and pedagogical skills that (Mouza, Karchmer-Klein, Nandakumar, Ozden, & Hu, 2014) highlighted. In other words, teachers must be proficient in three areas of effective teaching: pedagogy, subject-specific material (content), and technological usage. Teachers are required to combine technology with pedagogy and content in this setting and it was inspired by (Shulman's,1986) theory of Pedagogical Content Knowledge (PCK), (Mishra and Koehler, 2006) highlighted this approach by creating a framework for teacher knowledge called Technological, Pedagogical

Content Knowledge (TPACK), which focuses on technological integration.

2.1 TPACK

The technology integration framework known as TPACK, or technical, pedagogical, and content knowledge that highlights the three categories of knowledge that educators must integrate in order to successfully integrate Educational Technology (EdTech). This can be observed in the following figure:

Figure (1). The Three Types of Knowledge
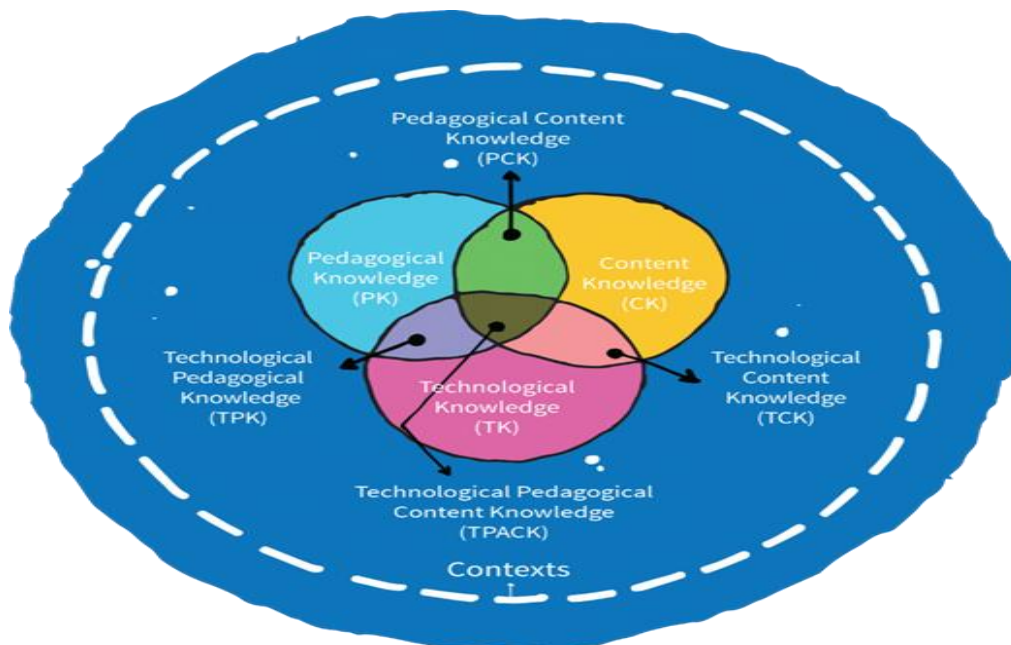
Source:(Mishra&Koehler, 2006)

At the heart of the TPACK framework, there are three main types of knowledge—content (CK), pedagogy (PK), and technology (TK)—. The TPACK method goes beyond considering each of these three knowledge sets separately. By highlighting the types of knowledge that sit at the intersections of the three main forms of technological content knowledge (TCK), pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPACK), the TPACK framework goes one step further. (Mishra &Koehler, 2oo6) illustrated it as follows:

- **Content Knowledge (CK):** What do you teach, and what level of expertise do you have in the subject? This summarizes the teachers' proficiency. CK may contain notions, theories, supporting

data, and organizational structures pertaining to a specific subject topic. It may also include some techniques for teaching students this information, as well as best practices. Furthermore, CK will change depending on discipline and grade level.

- **Pedagogical Knowledge (PK):** What instructional strategies are required to meet the requirements of the lesson plan as well as the needs of your students, and how do your pupils learn best? This is where you'll need to know what the best teaching strategies are. This encapsulates what educators know about procedures, tactics, and approaches used in instruction. The aims, ideals, and objectives of education are covered by PK as a generic category of knowledge. It can also be used in more specific domains including assessment, lesson planning, and classroom administration.

- **Technical Knowledge (TK):** Which digital instruments are you familiar with using, which ones are available to you, and which would be most suited for the current lesson? Students will need to label a diagram and give a presentation for this lesson, therefore it's critical that they be able to build slides, locate pictures online, fill in the gaps using an answer key, and more. This outlines the technical tools, resources, and expertise that instructors possess about various technologies. TK is about comprehending edtech, thinking about how it may be used in a particular topic area or classroom, knowing when it will help or hinder learning, and continuously learning about and adjusting to new technological advancements.

- **Pedagogical Content Knowledge (PCK):** knowing how to teach a certain subject to a particular set of pupils using the most effective methods. This sums up instructors' understanding of the fundamentals of teaching and learning, such as developing curriculum, evaluating students, and reporting findings. Similar to CK, PCK is subject- and grade-level-specific and focuses on articulating the connections between pedagogy and its supporting practices (curriculum, evaluation, etc.). However, PCK always aims to enhance instruction by making a good connection between the methodology and the subject matter being taught.

- **Technological content Knowledge (TCK):** understanding how to use the digital technologies at your disposal to improve or change the information, how it is presented to students, and how they may engage with it. This explains how educators perceive the ways in which material and technology may both support and contradict one another. TCK includes thinking about whether particular

edtech tools could be most appropriate for particular subject topics or classes, as well as comprehending how the subject matter might be presented via various edtech products.

- **Technological Pedagogical Knowledge (TPK):** having the ability to effectively utilize your digital tools to create the experiences and educational outcomes you want. This clarifies how educators perceive the potential for new educational affordances and limits that transform teaching and learning through the use of particular technologies. Another aspect of TPK is knowing how to integrate these resources with pedagogy in ways that are appropriate for the subject matter and the progress of the lesson being taught.

As a result, TPACK offers educators a useful framework for thinking through possible ways to incorporate instructional technology into the classroom. Additionally, TPACK may be used to quantify the knowledge of instructors, which may have an effect on the professional development and training options available to educators of all experience levels. Lastly, the TPACK framework is helpful, that it clarifies the kinds of knowledge that are essential for successful technology integration in the classroom. Teachers can still benefit from TPACK even if they are not familiar with the complete framework; they only need to know that content-driven, pedagogically sound, and technologically forward thinking information are the best shapes of the instructional practices.

Impact of the TPACK Framework in 21st-Century Learning

As demonstrated by (Abbitt, 2011), technology advancements affect many aspects of human life, including education. The TPACK Framework is the educational paradigm of the twenty-first century. The TPACK Framework is crucial for high-quality education, and educators working in the twenty-first century should rely on it. Teachers should interact with pupils using a multi-facilitator approach. The TPACK Framework has had the following basic impacts on education in the twenty-first century:

- Teachers may establish an effective, productive learning environment with the help of the TPACK framework.
- The TPACK framework concentrates on many fields of teacher knowledge and their connections, giving instructors a conceptual framework.
- The necessity to measure teachers' TPACK was brought about by the TPACK framework.

- The planning and implementation techniques for educational technology are made easier by the TPACK framework.
- Rather than focusing just on introducing new technology, the TPACK framework connects creative ideas for using a variety of technologies to instructors.
- By using instructional design to include technology into the teaching and learning process, educators may create TPACK.
- Proper weight is given to each of the three knowledge components: content, pedagogy, and technology.
- The TPACK framework generates lesson plans with the use of technology and demands professional development opportunities for teachers.
- **Advantages of the TPACK**

According to (Lee & Tasai, 2010), The TPACK Framework has a variety of benefits. They are listed as follows:

- Higher quality education: Because teaching approaches incorporate information from all three areas, the instruction is of a higher quality.
- Usability for all subjects and educational levels: The TPACK framework is suitable for use in the teaching of all subjects at all educational levels.
- Higher Level of Retention: In order to facilitate understanding and ensure adequate retention, a concept or idea is presented in a more detailed manner.
- Simple knowledge Reception: Learners may readily obtain knowledge through virtual explanation and process visualization.
- Effective reality or simulation transmission: It is feasible to transmit reality effectively through simulation.
- Encourages learners: By imparting subject knowledge through suitable teaching techniques and cutting-edge technology, this framework encourages students to learn.
- Ubiquitous nature: Education is accessible to everyone, wherever, and at any time. Information is always available to everyone who needs it. It offers adaptability.
- Improved access: The TPACK framework offers efficient access to learning.
- student-focused: Different technologies may be employed to meet the unique needs and learning styles of each student. Additionally, it is able to predict the demands of the students in the future.

- Encourages student cooperation: The TPACK Framework simplifies communication and cooperation.
- Teacher as facilitator: A teacher's job is to help pupils reach their learning objectives by actively involving them in the process.
- Economical: Instructors can upload resources online on a virtual classroom. Instead than printing their assignments anymore, students can send them to their professors via email. Consequently, the teacher and recipient might save money by utilizing TPACK.
- Disseminates Information: Teachers who are proficient in technology find it easy to convey materials to pupils and efficiently distribute knowledge.

Difficulties of the TPACK Framework

(Chai, Koh,&Tsai, 2010) illustrates that when using the TPACK Framework, one may encounter a variety of difficulties. They are as follows:

- Technical issues: Operator mistakes or technical issues might cause problems for teachers and students.
- Different Teachers Possess Different Knowledge in Pedagogy, Content, and Technology: It's possible that teachers differ in their familiarity with these three fundamental areas of teaching, learning, and technology. Hence, it could negatively impact the teaching-learning process.
- Inadequate training for integrating technology: Teachers might not be adequately informed about the technology beforehand. Negative feedback on technology integration may result from inadequate training.
- Time restriction: There may be a time constraint on the amount of time allocated for certain technology integration classes.

The TPACK is a comprehensive framework for thinking about the kinds of knowledge and strategies that educators need to acquire in order to effectively incorporate technology into the teaching-learning process. The TPACK offers several advantages that outweigh the difficulties in putting it into practice. Through simulation, the TPACK Framework conveys reality and produces higher-quality training. The teacher serves as a facilitator, and the focus is on the student. Since TPACK is a framework for teacher knowledge that integrates pedagogy, content, and technology, it may have a good effect on 21st century skills. It is imperative that we rethink our approaches to teacher training in the twenty-first century and suggest a TPACK framework that would better

equip educators of the new age to shape their teaching cognition to provide quality education.

As a technological integration model, TPACK investigates teachers' understanding of ICT as a pedagogical instrument in instruction. According to (Altun & Akyildiz , 2017, p. 469), the foundation of TPACK is the development of technology-enhanced instruction. This requires a thorough grasp of the notion of technology usage, pedagogical method (the use of technologies to create educational content in a constructive way), that makes learning simple or complex, and how to utilize technologies to help students with their challenges.

The TPACK study findings above demonstrate that the framework has been seen to be an important component of effective teaching. The framework combines content, pedagogy, and technology into a single unit that is essential for instructors in the current digital age. To assess the lecturers' total TPACK literacy, it is seen to be crucial to look at their technical, pedagogical, and content knowledge (TPACK) literacy. Acquiring information on their TPACK literacy facilitates the creation of thorough pedagogical instructions and a planned model of instruction based on the TPACK model. (Schmidt, Baran, Thompson, Mishra, Koehler, & Shin, 2009) provided the TPACK survey, which focused on pedagogical knowledge (PK), technology knowledge (TK), content knowledge (CK), and integrated technological, pedagogical, and content knowledge (TPACK).

Studies Related to TPACK :

The related studies on TPACK can be classified as follows: survey studies like (Abbitt, 2011a; Lee & Tsai, 2010), theoretical studies as (Abitte, 2011; Harris, Mishra & Koehler, 2009; Koehler & Mishra, 2009), basic interpretative study (Pamuk, 2011), Delphi survey (Yeh, Hsu, Wu, Hwang, & Lin, 2014), evaluation study (e.g., Chai, Koh, & Tsai, 2010), case study (e.g., Hofer & Swan, 2006; Niess, 2013), and instrument design (e.g., Lux, Bangert, & Whittier, 2011; Schmidt et al., 2009; Tseng, 2014).

As the understanding of TPACK has grown, several studies have created their own unique take on the concept. For example, (Lee and Tsai , 2010) evaluated teachers' perceived self-efficacy in using the Web to support their instruction using the acronym TPCK-Web. It was suggested to use TPACK EFL (Baser, Kopcha, & Ozden, 2015) to assess TPACK in EFL. According to Yeh, Hsu, Wu, Hwang, and Lin (2014), TPACK-practical focuses on the TPACK that educators really employ in response to situations they face in the classroom. Guerrero made the proposal for

mathematical TPACK (2010). Lux, et al. (2011) developed PT-TPACK to evaluate prospective teachers' views and comprehension of TPACK. Most TPACK-previous researchers are done in the fields of science and mathematics (Guerrero, 2013), but it is also occasionally done in the social studies and language domain (Voogt, Fisser, Roblin, Tondeur, & Braak, 2012; Wu, 2013). Pre-service teachers have been the subject of studies most frequently (Chai et al., 2010; Lux et al., 2011; Pamuk, 2011; Graham, Borup, & Smith, 2012; Koh, Chai, & Tsai, 2013; Sahin, Celik, Akturk, & Aydin, 2013). In-service teachers have been the subject of studies less frequently (Chai, Chin, Koh, & Tan, 2013; Guerrero, 2013). Studies on TPACK have been carried out initially in the United States and subsequently in Asian and Mediterranean nations including Vietnam, Singapore, China, Turkey, and Malaysia. To learn more about the potential for cultural variations in teachers' views of TPACK, more research on instructors outside of the United States is still required (Koh, Chai, & Tsai, 2010).

Apart from utilizing 21st century learning skills, some researchers employed technological initiatives that improved students' English language proficiency. For instance, in the context of English for Academic Purpose (EAP), Thang et al. (2014) carried out a Digital Story Telling (DST) experiment. The researchers discovered that students could work both alone and cooperatively through this project, and that study demonstrated the importance of teamwork. In addition, the DST initiative helped kids develop key 21st century abilities including communication, computer literacy, and creative thinking. In the meanwhile, Carriópastor and Skorczynska (2015) discovered that students' motivation increased when communication tools like Google Doc were integrated with collaborative learning. The thirty researchers discovered that students could meaningfully cooperate to finish assignments and projects while actively interacting via the Google Doc application when collaborative learning and communication technologies were used.

Nonetheless, there has never been any research done on EFL professional development using the TPACK framework. The components of TPACK are often reported individually in research. Cahyono (2010), for instance, evaluated research articles that EFL instructors in Indonesia submitted for a publication titled "Teaching English by Using Internet Resources." The usage of different Internet applications, such as social media, video-based apps, learning management systems, and virtual classrooms, was the main topic of the research papers that the instructors submitted. The goal of the research papers, however, was not always to

impart any substantive information to the pupils. Furthermore, the Internet apps were not deployed in a specific educational sequence anytime topic knowledge was stressed. All things considered, the study studies have not advanced the TPACK framework as a pedagogical, technical, and content knowledge integration.

Another illustration is provided by (Cahyono, 2014), who presented the findings of a study on the effectiveness of Indonesian EFL instructors in the setting of senior high school in Indonesia when they use pedagogical content knowledge. The study's findings demonstrated the necessity for pedagogical subject knowledge enhancement for English teachers. The study also found that implementing a lesson study program might help Indonesian EFL instructors in senior high schools become more proficient in their pedagogical topic knowledge (see Lewis, 2009 for additional explanation about lesson study). Therefore, research on how TPACK is used to Indonesian EFL instructors has to be done.

It may be concluded from the aforementioned investigations that TPACK has undergone thorough development as a framework. It has been used as a framework for both research and instructional strategies. This tendency may arise from the fact that certain subject areas require instructors to integrate information and communication technology (ICT) in order to carry out instruction since they include a greater amount of abstract knowledge. A few studies on TPACK been conducted with English as a foreign language (EFL). On the other hand, because learning English as a foreign language presents the same challenges as learning mathematics and science, TPACK research is also popular in the context of EFL. Wu and Wang (2015) conducted one study out of the few that were conducted. It investigated TPACK among twenty-two EFL instructors who were in Taiwanese primary schools. A TPACK instrument for pre-service EFL instructors is developed by Baser et al. (2015), while an instrument for evaluating EFL teachers' TPACK as seen by EFL students is developed by Tseng (2014). The study shows that the instructors' TPACK was of a high caliber. Mahdum (2015) carried out a research study on TPACK in Indonesia, utilizing a self-assessment questionnaire to examine how Senior High School EFL instructors in Pekanbaru used TPACK. So, the present research aims to enhance some EFL 21st century skills via a program based on TPACK.

Method

A. Participants

The study participants (n=30) were randomly drawn from the EFL students, fourth year at the Faculty of Special Education, Zagazig University, Egypt. There were two groups: N=15 for the experimental

group that were taught via a program based on TPACK and control one that were taught through regular instruction. To make sure that the experimental group and the control group were equivalent and that the development of the students' EFL 21st century skills is attributed to the effect of the TPACK based program, three variables have been controlled: the participants' age where all were from fourth year at the EFL Dept. at the Faculty of Specific Education, their EFL 21st century skills levels were measured by the pre-21st century skills test and EFL 21st century skills observation sheet.

Table (2): testing homogeneity between experimental group and control group in the overall of the EFL 21st century skills pre-test and observation sheet

EFL 21st Century Skills	Group	N	M	S.D	T-Value	Sig
Overall 21st century skills	Experimental	15	13.13	2.295	0.340	0.737 Not Sig
	Control	15	13.40	1.993		
Observation sheet	Experimental	15	31.60	3.460	0.603	0.551 Not Sig
	Control	15	32.10	2.520		

From this table, it is concluded that there wouldn't be significant differences between the mean scores of the experimental group and the control group in both of EFL 21st century kills pretest and pre observation sheet. This result illustrates that there is a homogeneity between experimental group and control group.

Study Instrument

To fulfil the study's objectives, three instruments were prepared. They were as follows:

1- An EFL 21st Century Skills (4Cs) Checklist
2- An EFL 21st Century Skills (4Cs) Test
3- An EFL 21st Century Skills (4Cs) Observation Sheet

1. The EFL 21st Century Skills (4Cs) Checklist:

The Aim of the Checklist

The EFL 21st century skills checklist was developed by the researcher to identify the EFL 21st century skills needed by fourth Year EFL students at Faculty of Specific Education, Zagazig University, Egypt.

The items of the EFL 21st century skills checklist were adopted from: reviewing the literature and related studies concentrate on enhancing of

EFL 21st century skills, as (Dede, 2010), (Cohan & Honigsfeld, 2011) and (Wolf et al, 2018).

Validity of the Checklist:

The checklist was sent to a jury members (n = 10) see appendix (A) who were experts in the field of EFL teaching. They were asked to illustrate the suitability of the item of the checklist for EFL prospective teachers, and illustrate the degree of importance of each item. The checklist was considered valid.

The checklist consisted of four skills (critical thinking, creativity, communication and collaboration) appropriate for the level and prior knowledge of the students (see appendix B).

2. The EFL 21st Century Skills Test:

Purposes of the EFL 21st century skills Test

The test was designed to be used as a pre-posttest. Before implementing a TPACK-based program, it was utilized to determine the students' actual level in EFL 21st century skills. It was used as a post-test to investigate the effect of a TPACK-based program in the developing EFL 21st century skills.

Constructing of the EFL 21st Century Skills Test

The following sources were taken into consideration while constructing the test:

a- investigating relevant research for developing EFL 21st century skills tests,

b- the EFL 21st century skills confirmed by the results of the checklist .

The EFL 21st Century Skills Test Description

The test consists of four items, including the main skills of EFL 21st century skills (4Cs) and its sub-skills. See appendix (C)

Validity of the EFL 21st century Skills Test

To measure the validity of the test, it was submitted to EFL specialists (n=10) to evaluate the test as a whole in number of questions, correctness, level of comprehension and time limits. The test proved to be valid as it amounted to (0.94).

Reliability of the EFL 21st Century Skills Test

Students who weren't members in the participating groups took the test. The coefficient of reliability was computed using the Cronbach's Alpha formula. Cronbach's Alpha was (0.89), this illustrated that the test was reliable.

Piloting the EFL 21st Century Skills Test

The aim of piloting the test was: (a) timing the test; (b) illustrating the difficulty of the test's questions. Ten students took part in the test

piloting, they were selected randomly for piloting the test. The results of the piloting the test demonstrated that the test is appropriate for EFL prospective teachers at the faculty of Specific Education, Zagazig University, Egypt. The allocated time was determined by calculating the mean time which the fasted students and the lowest one took in answering the test. The allocated time was 2 hours.

3. The EFL 21st Century Skills (4Cs) Observation Sheet

The aim of the EFL 21st century skills Observation Sheet:

The aim of the observation sheet was to observe if the student teachers use 21st century skills while teaching English language for the primary stage pupils or not .

Description of the EFL 21st Century Skills Observation Sheet:

The observation sheet consisted of four dimensions (critical thinking, creativity, communication and collaboration) under each skill, there are some tasks see appendix (D).

Validity of the EFL 21st Century Skills Observation Sheet:

The observation sheet was submitted to a panel of jury (n=10) who were experts in teaching English as a foreign language. They were requested to indicate the suitability of the observation sheet's dimensions and items for the EFL prospective teachers, and determine the degree of availability of each items. The observation sheet was considered valid.

Reliability of the EFL 21st Century Skills Observation Sheet:

A group of students who weren't in the participating groups took the observation sheet. The coefficient of reliability was computed using the Cronbach's Alpha formula. Cronbach's Alpha was (0.89), this indicated that the observation sheet was reliable.

Piloting the EFL 21st Century Skills Observation Sheet:

The aim of piloting the observation sheet was: (a) timing the observation sheet; (b) illustrating the difficulty of the observation sheet's dimensions and items. Ten students took part in the observation sheet piloting, they were selected randomly for piloting the observation sheet. The results of the piloting the observation sheet indicated that the observation sheet dimensions were suitable for for EFL prospective teachers at the faculty of Specific Education, Zagazig University, Egypt. The allocated time was determined by calculating the mean time which the fasted students and the lowest one took in answering the test. The allocated time was one hour.

3.4. The TPACK-Based Program:

The Aim of the Program

This program aimed to develop EFL skills. 21st century skills among EFL prospective teachers at the Faculty of Specific Education, Zagazig University, Egypt.

The Objectives of the Program

By the end of teaching this program, the EFL prospective teachers should be able to:

1- **Think critically:**
a) Utilize various thinking techniques, such as deductive and inductive reasoning, to comprehend a problem.
b) Examine intricate systems and comprehend how the systems' interdependent components support one another.
c) Compile pertinent data.
d) d. Make meaningful inquiries that elucidate opposing viewpoints and aid in problem-solving.
e) Make decisions by deciding on relevant criteria and locating potential options to ensure dependable selections.

2-Be Creativity:
a) Use a variety of methods to generate ideas, such as brainstorming
b) Generate original, valuable notions, both incremental and radical.
c) Develop, polish, examine, and assess their own concepts in order to enhance and optimize creative endeavors.
d. Put innovative ideas into action to contribute significantly and practically to the field where the innovation will take place.

3-Communicate Effectively:
a) Use verbal language accurately and fluently
b) Utilize use of technological devices and situations to enhance individual and group learning
c) Effectively and efficiently share information via the use of suitable technological devices and conditions.
d) Use a variety of mediums and formats to effectively and clearly communicate ideas and views to diverse audiences.

4-Collaborate by:
a) Work effectively on teams or groups.
b) Achieve a common goal by being adaptable and willing to make concessions to team members.
c) Show accountability while working as a team to achieve a common objective.
d. Employ a few communication techniques, such as cooperative and competitive techniques.

Content of the Program
Figure (2) A TPACK Components

Source: http:// tpack.org
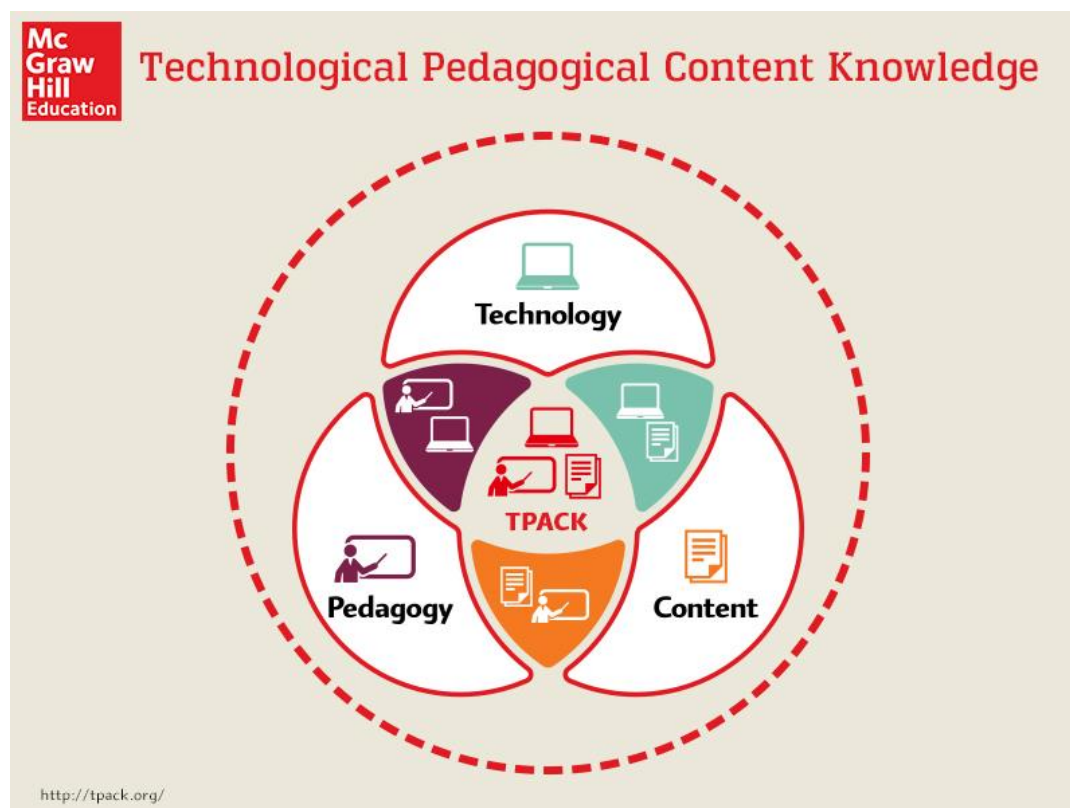
To educate and encourage learners toward a deeper comprehension of the subject matter, the TPACK states that particular technological tools (hardware, software, applications, related information literacy practices, etc.) are best utilized. Thus, within the TPACK framework, the three categories of knowledge—TK, PK, and CK—are integrated and recombined in different ways. While pedagogical content knowledge (PCK) describes the same relationships and interactions between pedagogical practices and specific learning objectives, technological content knowledge (TCK) describes the relationships and intersections between technologies and learning objectives. Technological pedagogical knowledge (TPK) describes the relationships and interactions between technological tools and specific pedagogical practices. TPACK, which takes into account the connections between all three regions and recognizes that educators are working in this intricate environment, therefore the combination of these three triangulated domains is known as TPACK, which takes into consideration the connections between them all and recognizes that educators are working in this intricate environment.

Tasks and Activities of the Program

Prospective teachers should receive adequate technological literacy training in the context of TPACK in order for them to become proficient in delivering multiple learning approaches, such as face-to-face instruction, blended learning, distance learning, flipped learning and home-schooling (McGarr & McDonagh, 2019). In addition, educators must develop the capacity to convey and demonstrate their expertise in a variety of contexts and situations within the classroom. Teachers must, in particular, understand the relationships between the subject, pedagogy, and technology—the three fundamental elements of effective teaching—and how these elements work together.

Activity Types: Attend to a Demonstration, Investigate a Concept, Categorize Interpret a Representation, Do a Demonstration, Produce a Representation, Compare and Contrast, Create a Process

Possible Technologies: Presentation software, document camera, video, interactive video, podcasts, Interactive whiteboard,

For more details about activities and possible technologies see appendix (e)

Evaluation of the Program

The researcher evaluated the students after each session by giving them some exercises and quizzes to check the students 'understanding of the session's content. This represented **formative evaluation.**

Summative evaluation is represented in the post administration of the 4Cs skills test.

Duration of the Program

The program based on TPACK consisted of eight sessions plus two sessions, one for pre-testing at the beginning of the program and another one for post-testing after the treatment. The total sessions of the program were ten sessions

Experimental Procedures

a- Pre-testing

The researcher pre tested students on fourth of March 2023 using 4Cs skills test. She also observed the students while they were teaching in the primary school using an EFL 21st century skills observation sheet to indicate if they were using 21st century skills while teaching English Language or not.

b- Treatment

The researcher taught the TPACK to the experimental group students focusing on the three cornerstone of TPACK which are TK, PK, and CK. This lasted for eight weeks.

c- Post-testing

The researcher post tested students using 21st century skills test(4Cs) on 7 May2023 and also post observed them while teaching using EFL 21st century skills(4Cs) observation sheet.

The researcher treated the data statically, then the results and discussion are as follows:

4. Results and Discussion:

4.1. Study Findings:

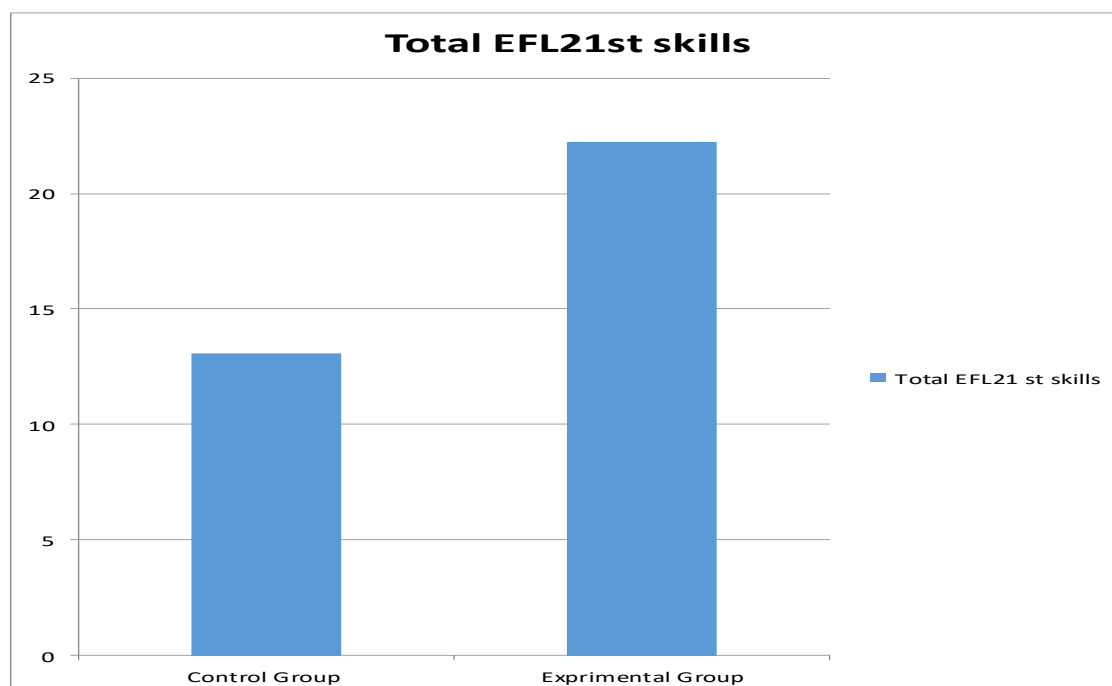The study's findings will be discussed in relation to the research hypotheses.

Hypothesis (1):

There would be a statistically significant difference between the mean scores of the control group and those of the experimental group on overall EFL 21st century skills post- test in favor of the experimental group.

Table (3): T- test results of the experimental group and control group in the overall EFL 21st century skills post-test.

EFL 21st Century Skills	Group	N	Mean	S.D	t-value	Sig	Effect Size	Level of Effect Size
Overall the skills	**Experimental**	15	22.21	1.265	14.003			large
	Control	15		2.178		0.01	.871	
			13.07					

A t-test for independent samples was used to validate this hypothesis. The mean scores, the standard deviation and the t-value of the experimental group and that of the control one in the post-test of the overallEFL21st century skills were computed. As shown in table (3), results indicated that the mean score of the control group in overall EFL 21st century skills is 13.07. on the other hand , the mean score of the experimental group in the overall EFL 21st century skills is 22.21.Also it can be noticed that t-value for overall EFL 21st century skills is 14.003, which is significant at 0.01level in favor of the experimental group. So, this hypothesis is accepted.

Figure 3.comparison of the mean scores of the experimental group and the control group in the overall of EFL 21ˢᵗ century skills post-

testFrom this results, it is concluded that the TPACK based program is effective in developing the overall EFL 21ˢᵗ century skills where its effect size was .871 .This result indicates that the level of the program effect size is large.

Hypothesis (2).

There would be a statistically significant difference between the mean scores of the control group and those of the experimental group on each of EFL 21st century skills in favor of the experimental group.

Table (4) T- test results of the experimental group and control group in each of the EFL 21st century skills post-test.

EFL 21ˢᵗ century skills	group	N	M	S.D	T-value	Sig	Effect Size	Level of Effect Size
Critical Thinking	Experimental	15	5.47	0.516	10.435	0.01	0.790	Large
	Control	15	3	0.756				
Creativity	Experimental	15	5.60	0.507	11.881	0.01	0.830	Large
	Control	15	3.40	0.507				
Communication	Experimental	15	5.47	0.516	8.896	0.01	0.732	Large
	Control	15	3.40	0.737				
Collaboration	Experimental	15	5.67	0.488	10.845	0.01	0.802	Large
	Control	15	3.27	0.704				

Significant at (0.01)

Table (4) shows that there is a statistically significant difference between the mean scores of the control group and those of the experimental group on each of the EFL 21st century skills posttest for the experimental group. TPACK based program is effective in developing each of the EFL21st century skills, where the effect size of critical thinking is (0.790), for creativity skill is (0.830), for communication skill is(0.732) and for collaboration is(0.802) , which is significant at (0.01).Therefore, this hypothesis was confirmed. These differences can be attributed to utilizing the TPACK based program.

According to the findings of Cohen's formula and the interpretations of the effect size, the percentage of the effect size and its levels indicate that the program based on TPACK has a very large effect on improving the students' EFL 21st century skills.

Figure (4) comparison of the mean scores of the experimental group and the control group in each of the EFL 21st century skills post- test
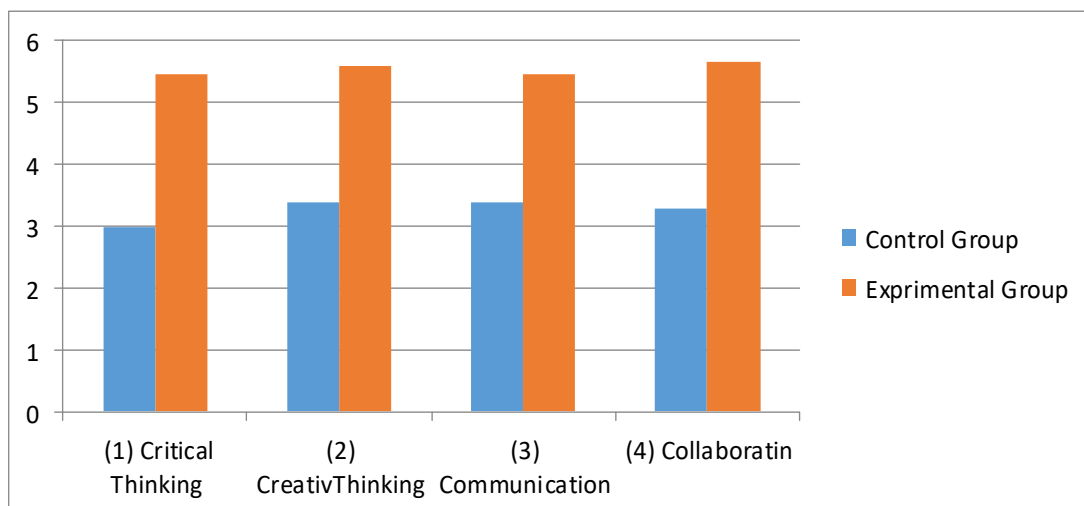
Hypothesis (3)

There would be a statistically significant difference between the mean scores of the control group and those of the experimental group on overall dimensions of EFL 21st century skills observation sheet in favor of the experimental group.
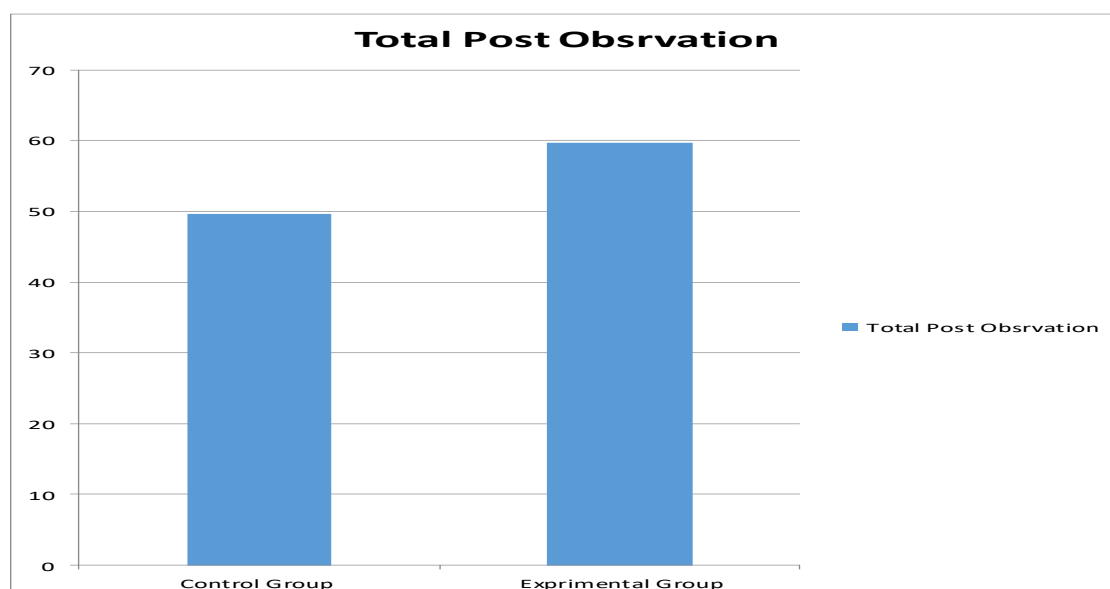
Table (5) T- test results of the experimental group and control group in the overall EFL 21st century skills post-observation sheet

EFL 21st Century Skills Observation Sheet	Group	N	M	S.D	T-value	Sig	Effect Size	Level of Effect Size
Total Score	Experimental Control	15 15	59.734 49.60	2.685 2.501	10.695	0.01	0.798	Large

Significant at (0.01)

Table 5 shows that there would be a statistically significant difference between the mean scores of the control group and those of the experimental group on the post observation sheet for the experimental group, where the mean scores of experimental group is 59.734 while the mean scores of control group is 49.60, the t-value is 10.695 , the effect size is 0.789 and the level of the effect size is large .so this hypothesis is accepted and the TPACK based program is, therefore, effective in developing the prospective teachers' EFL 21st century skills.

Figure (5) comparison of the mean scores of the experimental group and the control group in the overall of EFL 21st century skills post-observation sheet

Hypothesis 4.

There would be a statistically significant difference between the mean scores of the experimental group on overall dimensions of EFL 21st century skills pre-post observation sheet in favor of the post observation sheet.

Table (6) T- test results of the experimental of the overall EFL 21st century skills pre-post observation sheet

| EFL 21st century Skills Observation Sheet	Pre-post observation sheet	N	M	S.D	T-Value	Sig	Effect Size	Level of Effect Size
Total Score	Pre post	15 15	31.60 59.73	3.460 2.685	21.202	0.01	0.970	Large

Significant at (0.01)

From this table it is concluded that there is a significant differences between the mean scores of the experimental group on overall pre-post

EFL 21st century observation sheet in favor of the post observation sheet where mean scores for the pre observation sheet is 31.60 while the mean score of the post observation sheet is 59.73, the t- value is 21.202, the effect size is 0.970 and the level of the effect size is large. So this hypothesis is accepted and the TPACK based program has a large effect in developing EFL 21st century skills among prospective teachers.

Figure (6) comparison of the mean scores of the experimental group in the overall of EFL 21st century skills pre-post observation sheet
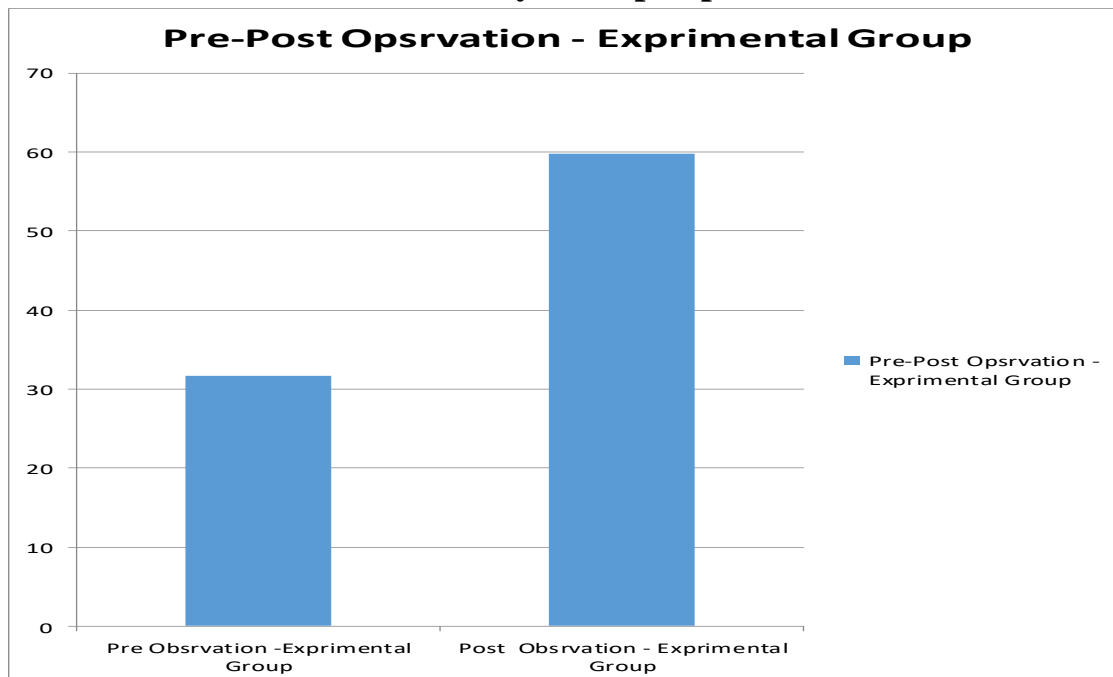
Hypothesis 5.A program based on TPACK is proved to be effective in developing EFL 21st century skills among prospective teachers.

According to this hypothesis, "The application of a program based on **TPACK** has a large effect on the development of EFL 21st century skills among the prospective teachers at the faculty of Specific Education.

In order to test this hypothesis, the researcher used Cohen's method to compare the experimental group's pre- and post-test scores for EFL teaching skills, and then used the paired sample t-test to compute the effect size. These results was statically computed in the previous hypotheses according to this formula.

4.2. Discussion:

This study's main goal was to find out if using a program based on the TPACK framework had any impact on the participants' development of EFL 21st century skills. The current study's findings showed that the

program had a favorable and substantial impact on their EFL 21st century skills.

entails raising awareness of and improving skills in citizenship, digital literacy, collaboration and communication, critical thinking and problem solving, creativity and imagination, and student leadership as well as personal growth. It entails choosing suitable approaches and materials for introducing, enhancing, and assessing students' abilities in the aforementioned fields as well as highlighting the significance of 21st century skills to students. It also entails evaluating your own strengths and shortcomings about your level of 21st century competency and your capacity to raise your students' level of competence in these domains.

The post-test findings showed that the means of the scores on the EFL 21st century sub-skills pre- and post-test differed statistically significantly. Consequently, it can be said that the program was educationally and statistically important in helping the participants improve the 4Cs of the EFL 21st century skills (collaboration, critical thinking, creativity, and communication). The participants can think critically as they can:

a-Use several methods of thinking, including deductive and inductive reasoning, to comprehend a problem.

b-Analyze complicated systems and comprehend how the systems are supported by their interrelated elements.

c-Gather pertinent data.

d- Make meaningful inquiries that elucidate viewpoints and aid in problem-solving.

e-Make judgements based on relevant criteria and alternative identification to provide trustworthy conclusions

Their **creative thinking skills** also developed as they became able to:

a) Employ a variety of methods to generate ideas, including brainstorming.

b) Generate original, valuable notions (both incremental and radical ideas)

c) Develop, polish, examine, and assess their own concepts in order to enhance and optimize creative endeavors

d) Take action on innovative concepts to contribute concretely and beneficially to the field where the innovation will take place.

Their **Communication skills** were also developed as they became able to:

a-Use verbal language accurately and fluently

b-Utilize Digital media and surroundings to facilitate individual and collective learning

c) Use suitable digital medium and settings to efficiently and effectively share information.

d. Use a variety of mediums and forms to effectively and clearly communicate ideas and concepts to diverse audiences.

Their Collaboration skills were also developed as they became able to:

a-Work effectively on teams or groups.

b-To achieve a shared objective, be adaptable and prepared to make concessions to your teammates.

c) Exhibit accountability as a team player pursuing a common objective.

d-Use some communicative strategies e.g. cooperation, competitive strategies

5. Conclusions, Recommendations and Suggestions:

5.1. Conclusions

With references to the previously mentioned results, discussions and findings of previous studies, the following conclusions could be conducted.

- The results of this study validated the effect of the TPACK based program on developing EFL prospective teachers' 21st century skills at the Faculty of Specific Education, Zagazig University, Egypt.

 - The program may be applied to offer additional instructions to assist students overcome challenges related to 21st century skills (4Cs). For students to feel confident, they need to be in a communicative and collaborative setting that is built on interactions between classmates and the instructor.

- EFL 21st century skills include the following sub-skills

1. Communication: asking questions and exchanging ideas and thoughts. Teaching communication skills might involve using non-verbal clues like hand gestures and facial expressions in addition to spoken communication. Educating students on responsible digital space navigation is crucial, especially in light of the increasingly digitalized world we live in.

2. Collaboration: combining efforts to accomplish a common objective. People must collaborate in some manner for the majority of job options. It is crucial that children begin to understand how to solve problems and approach situations when there are several parties involved in addition to oneself. Younger children may find it challenging to understand another person's perspective or point of view. It takes a lot of practice to become proficient at this talent.

3. Critical thinking: adopting a fresh perspective on issues.

Solving problems, solving brain twisting riddles, and questioning "Why?" are all components of critical thinking. However, a big component of critical thinking in today's environment of instant access to information is the ability to evaluate the credibility of information.

5. Creativity: attempting novel responses to issues.

Students who are artistic or musical are frequently thought of as being creative, but creativity encompasses so much more. To put it simply, creativity is the ability to think creatively in any field. Encouraging children to explore new things and providing a secure environment for them to express themselves are two ways to teach and nurture creativity in children.

Thus the 21st century skills (critical thinking, creativity, communication and collaboration) the 4 Cs go hand in hand with each other and students need to be equipped with the skills in all four areas to help them succeed in their future.

5.2. Recommendations:

Based on the results and conclusions of the current research, the researcher presented the following recommendations:

1- The EFL 21st century skills should be allocated more space in the text book and timetable at the faculties of Education.

2- EFL instructors must develop EFL 21st century skills by offering relevant and captivating content.

3- utilizing the program based on **TPACK** while learning English

4- EFL instructors ought to get training in the execution of a program based on **TPACK to** enhance EFL 21st century skills among students at the faculties of Education.

5. With an emphasis on 21st century skills, syllabus authors and textbook designers should create more useful textbooks and teacher's guide.

5.3. Suggestions for further Studies:

The following fields are suggested for other researches

1- Several studies are required to offer practical and effective methods for enhancing EFL 21st century skills. This is due to the fact that the field of study is still under research despite its importance.

2- To support EFL instructors in their professional development, it would be beneficial if more researchers created in-service training program for them. their competencies and proficiencies in teaching English as a second language

3- More researches are required to investigate using the program based on **TPACK** framework in enhancing language skills such as speaking, reading, listening, and writing skills.

4- Future researches may be conducted to determine how TPACK relates to other psychological elements as awareness, attitudes, self-confidence, apprehension, and learner's aptitude.

5- Many researches are required to implement the TPACK-based program to teach English to other types of learners, such as those who struggle with instruction.

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