TPACK Framework Towards 21st Century's Pre-Service English Teachers: Opportunities and Challenges in Application

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Abstract:

Learning in the 21st century integrates various technological devices in carrying out a whole series of interaction processes between students and teachers with learning resources in a learning environment. Pre-service English teachers in 21st century must have knowledge as well as skills in using various technologies, both traditional and modern to facilitate learning and improve learning outcomes. This article aims to examine, explain and review the development of technological pedagogical and content knowledge (TPACK) for Pre-service English teachers in 21st century, in order to obtain an overview of the opportunities and challenges in implementing TPACK itself in the 21st Century Learning. This article using a systematic review method of books, journal articles, and other documents related to the topic of discussion. All sources were selected based on the publication year that was set, namely 2017-2022 so that accurate and up-to-date data could be obtained. The results of the study found that, TPACK is a new type of knowledge that must be mastered by pre-service English teachers to be able to integrate technology well in learning. TPACK can be used as a framework for designing teacher education curricula that are more in line with the era and demands of 21st century learning.

Keywords: *TPACK, 21st Century's Pre-Service English Teachers, TPACK Challenges and Opportunity*

Introduction

Pre-service Teachers must be equipped with teaching methods, how to use information and communication technology (ICT), how to strengthen mastery of scientific content in learning because of the innovation and creativity of Pre-service English teachers in developing learning models, research and evaluation based on information communication technology (ICT) is a priority scale to improve the learning process. Teaching is not enough just to understand how to teach but also to understand the content of the material so that pre-service English teachers must have knowledge of curriculum, students, assessments and

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instructional strategies so that they are able to transform science knowledge effectively. In implementing the current curriculum, it is hoped that Pre-service English teachers are able to utilize and use technology, master technology, and apply technology in the learning process. A Pre-service English teacher must have the Technological Pedagogical Content Knowledge (TPACK) ability which has been mentioned by the latest learning issues (Kusuma & Kusuma, 2021). A Pre-service English teacher must have the Technological, Pedagogical, and Content Knowledge (TPACK) ability which has been mentioned by the latest learning issues.

TPACK is a combined conceptual framework of interrelated content knowledge (material), pedagogy and technology. TPACK is a framework that tries to understand the relationship between the use of technology (Technological Knowledge), knowledge about teaching (Pedagogical Knowledge), and subject matter (Content Knowledge) (Turgut, 2017). In TPACK, to make learning more effective and efficient, it is necessary to integrate technology in learning by Pre-service English teachers (SarÄ±Ã§oban et al., 2019). This shows that TPACK is an important component that which can be used as a source for improving and evaluating the qualities of education. One of the strong influences in the world of education is technology because of the role of technology in educational activities as a tool that can change the learning process, and good teaching requires Pre-service English teachers and students to use or utilize technology in organizing,

collecting, and evaluating information to solve problems.

Acquisition of ICT is now part of the competencies required by preschool English teachers, both to support task delivery (planning, presentation of learning, assessment and analysis of assessment results) and to provide learning content resources, both as a means of finding and downloading. For Pre-service English teachers, mastery of knowledge about technology in education makes Pre-service English teachers able to adapt to the current developments (Habibi et al., 2019). As a professional English teacher candidate, it is proper for a Pre-service English teacher to always be able to develop his competence, especially in the field of learning. One way to develop this competence is by mastering and utilizing technology. However, in fact, currently the use of equipment and equipment (technology) in relation to TPACK has become something common in the educational environment, but how to integrate it in teaching English in the classroom has been a challenge for many years. One way that Pre-service English teachers can do to overcome this is through mastery of technological, pedagogic, and content or scientific knowledge known as TPACK (Atar et al., 2019). The TPACK framework should be built based on the needs and characteristics of students which can be identified through needs analysis, so that the design of the learning process is in accordance with what is needed by students. To clarify how TPACK is a learning framework in the 21st century,

this study was conducted. In addition, there is a lack of reviews of previous research which allows for an overview of the opportunities and challenges of TPACK itself in its implementation in 21st century learning. For these reasons, this study aims to examine, explain and review the development of technological pedagogical and content knowledge (TPACK) for Pre-service English teachers in 21st century, in order to obtain an overview of the opportunities and challenges in implementing TPACK itself in the 21st Century Learning.

In addition, technological developments have a major influence on the educational process, especially in 21st century learning (Tseng et al., 2019). In 21st century learning, it is not enough for Pre-service English teachers to only have knowledge of the material being taught and how to teach it, but also require knowledge of technology and its use in teaching. Learning in the 21st century integrates a variety of technological devices to carry out all interaction processes between students and English teachers using learning resources in the learning environment. Technology as a tool, process, it also plays an active role as a learning source and learning implementer at the same time.

Nowdays is the era of 21st century and the use of technology in our daily lives, including in the world of education, has become mandatory. Integrating technology into learning is a very important action for English teachers during this tim (Koh et al., 2018). Pre-service English teachers must be able to choose the right technology with learning materials and strategies. English teachers should be able to choose the right technology with learning materials and strategies. Future English teacher candidates must be confident that they possess sufficient knowledge, skills, and technology literacy to enable them to effectively and efficiently integrate technology into their learning. The 21st century encourages all English teachers and teaching practitioners to acquire a comprehensive knowledge of her ICT, as today her ICT developments have a great impact on the learning process (Wardani, 2020). Pre-service English teachers or knowledge required by pre-service English teachers relate to the use of technology by incorporating technology into a learning process called TPACK. This article describes new skills for the English teacher on duty, including understanding TPACK and her application of TPACK.

Review Literature

Rapid technological change has a profound impact on the development of the learning process. This requires that the Preschool English Teacher profession has the ability to use technology and the ability to use technology in the classroom learning process. Technological Pedagogical and Content Knowledge (TPACK), or knowledge of content or learning materials, pedagogy, and technology, is a conceptual framework that synergistically uses technology in the learning process. This framework is an

evolution of that conveyed by (Mishra & Koehler, 2006) about the need for the English teacher profession to have the ability to integrate, (1) knowledge of pedagogy or pedagogical knowledge which is the ability to understand students, class management, planning and evaluation of learning; (2) knowledge of learning materials or content knowledge.

Besides that, (Koehler et al., 2013) argues that there are three categories of knowledge that must be developed by Pre-service English teachers, namely, (1) knowledge of the content of learning materials that involves knowledge of reality and ideas; (2) knowledge of pedagogical content which is knowledge of pedagogical content, substance in the learning process which is interpreted as how the learning process should be delivered so that it is more easily understood by students; (3) knowledge of curriculum or lesson plans related to how to design a learning process that synergizes between subjects and pedagogy. The presentation illustrates that knowledge of pedagogy and content is an important key in the learning process (Liando et al., 2023; Liando et al., 2023; Liando et al., 2022; Liando & Tatipang, 2022). Pre-service English teachers must be able to interpret learning materials and convey them in an appropriate way through appropriate learning process designs.

In its development, what is conveyed by (Zipke et al., 2019) regarding pedagogical knowledge and content or pedagogical content knowledge (PCK) has expanded its meaning with the integration of technological knowledge or technology knowledge. Knowledge of technology is understood as the ability to use technology productively. Alharbi, (2020) defines technological knowledge as an ability that not only knows about the various basics of technology, but also knows and understands how and when to use technology to improve the quality of learning for students. Bostan & Şener, (2021) Technical knowledge means (1) the ability to comprehensively understand and apply information technology. (2) Recognize when information technology helps or hinders the achievement of goals. (3) Ability to respond to various changes in information technology. The statement concludes that technical knowledge refers to technical competence, i.e. the ability not only to know technology, but also to be able to criticize its use and make decisions.

Ultimately, TPACK is a conceptual framework that emerged as a result of a mix of content, pedagogy and technology. This concept is the basis for conducting a learning process through the effective use of technology, so that (Elas et al., 2019) argue that we need to (1) understand how concepts are presented when using technology; (2) Pedagogical techniques that use technology constructively to convey content. (3) knowledge of what makes learning a concept difficult or easy and how technology can help solve some of the problems students face; (4) knowledge of the student's prior knowledge; (5) knowledge of how to use technology to build on existing knowledge; The use of technology in the learning

process is still seen as somewhat challenging, so preschool English teachers need not only knowledge and desire, but also a commitment to develop the use of technology in the learning process.

Research Method

This research is a systematic review, this method is systematically performed by following the correct phase or study protocol. A systematic review is a method of using assessment, research, structured assessment, categorization and classification based on previously generated evidence (Hariyati, 2010). The steps for conducting a systematic review are so well-planned and structured that this method is very different from the method solely intended to convey a literature review. The procedure taken in conducting this systematic review consists of several steps, which is:

a. **Compiling the Background and Purpose of the research (Background and objectives)**. In this stage, explanations and descriptions about the TPACK toward its opportunity and Challeges.

b. **Concluding/Determining Research Questions**. In this study, the researcher examines the problem through research that comes from reports on the results of previous studies that have been obtained, which are then formulated based on what the objectives of this research are.

c. **Searching for research sources which are articles, proceedings and Thesis**. In this study, researchers searched online data that could be easily accessed such as Google Scholar, Garuda and Web Journal. Based on the theme taken by the researcher about TPACK, the researcher conducted a search for journal data using key words related to these themes.

d. **Selecting every source obtained**. The selection of sources in this study was determined based on the research theme, which is TPACK towards its Opportunity and Challenges of the Pre-service English Teachers. With these themes, the selection of sources in the research process is based on the following criteria: a) Journal, Proceedings and thesis published in a span of 5 years (2017-2022). b) Journal indexed on Google Scholar.

e. **Practical Screen**. Quality assessment in this study is to exclude and include research that will be included in a systematic review based on quality. These criteria can cancel the journals that have been obtained for further analysis. The assessment was carried out on journals by whether the journals were published at the time that had been set, which is from 2017-2022, taking into account the themes in this study.

f. **Quality check of each source obtained and implementation of**

the Data Synthesis Strategy Procedure. After the screening process is performed, the results of this data extraction confirm the number that still meets the requirements for further analysis. Carry out data extraction from individual studies to obtain important findings in predefined sources. In addition, in this stage, important data is grouped and then studied in depth with the data, facts and information obtained from each source that has been obtained so that further conclusions can be drawn that can answer the objectives.

Findings and Discussion

TPACK Concept for Pre-Service English Teachers

Technological Pedagogical Content Knowledge (TPACK) is a framework that identifies the knowledge that preschool English teachers need to teach effectively using technology frameworks. According to (Koehler et al., 2013) TPACK streamlines teaching practice by integrating technology into the learning environment and understanding the types of knowledge preschool English teachers need to understand concepts and a framework to explain. The basic concept of TPACK existence is: TPACK was first introduced by (Mishra & Koehler, 2006). They discussed her TPACK as a framework for preschool English teachers/designers to integrate technology into learning. The concept of TPACK emerges in learning techniques

based on the Teaching Content Knowledge (PCK) model.

Figure A. TPACK Framework
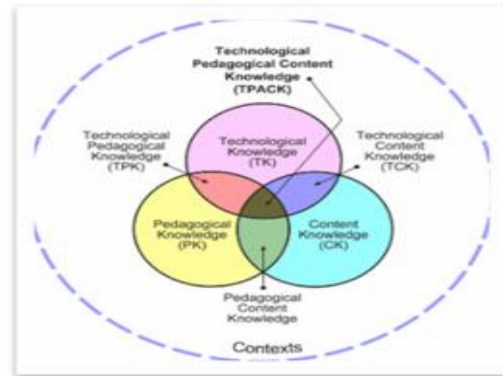
The basic concepts of TPACK emphasize the relationship between subject matter, technology, and pedagogy (Mishra & Koehler, 2006). The interaction between the three components has the power and appeal to foster student-centered and active learning. This can also be interpreted as a form of learning shift that was originally focused on transitioning English teachers to preschool students. TPACK emphasizes the relationship between interacting technology, curriculum content, and pedagogical approach. Kirana & Nabhan, (2021) stated that the TPACK schema has relationships among the intersecting components between material (C), pedagogy (P), and technology (T) that influence the context of learning field. Additionally, the diagram shows the relationship of the three components. The components are C, P, and K, and let C be (CK). P becomes (PK), T becomes (TK), and the relationship between the components can be described as:

Content knowledge (CK) is the knowledge about the material being studied. Materials are included in the curriculum. For example, if a high school student studies an English subject, the limitations of the subjects included in the curriculum should be interpreted as a whole. According to Nurpratiwi, (2021) subjects include knowledge in the form of concepts, theories, ideas, frameworks, methods with scientific methods, and their applications in everyday life Example Concept of present, past and future.

Pedagogical knowledge (PK) represents detailed knowledge related to the theory and practice of teaching and learning, including goals, processes, assessment learning methods, strategies, etc. Dewi et al., (2020) stated that Knowledge of pedagogy requires understanding aspects of cognitive, affective, social and development of learning theories and how these theories can be applied in the learning process. Pre-service English should understand deeply and focus on the required pedagogy, namely how students understand and construct knowledge, attitudes and skills. Examples: constructivism, Scientific, Discovery Learning, Project based learning, Problem based Learning, guided inquiry, question and answer, discussion, presentation, observation, practicum.

Technology Knowledge (TK) is the basics of technology that can be used to support learning (Ringotama, 2020). For example, the use of software, animation programs, internet access, molecular models, virtual laboratories and others. For this reason,

Pre-service English teachers need mastery in processing information, communicating with ICT in learning. Ringotama, (2020) emphasizes that basic knowledge, knowledge of technology and skills in using it to support understanding of the subject matter being studied. Furthermore, mastering this technology is a demand for 21st century students (Jordan, K. 2011). Example: googledrive, onenote, chemdraw, chemsketch, prezziedmodo, youtube, Ulead, Window, movie, etc.

Pedagogy Content Knowledge (PCK) includes the interaction and intersection between pedagogy (P) and subject matter (C). According to Kusuma, (2022) that PCK is a concept of learning that delivers subject matter contained in the curriculum. This includes the learning process related to the subject matter studied as well as the assessment system for participants. The learning model is expected to be able to deliver participants to learn effectively. Understanding the relationship and intersection between (P) and (C) which briefly concerns how (P) can affect (C) According to Koehler et al., (2013) PCK is a set of knowledge, curriculum fields of study. Knowledge transformation, general pedagogy, learning strategies in educational contexts (Mishra & Koehler, 2006). Examples: Project based learning as a strategy used in learning the concept of present tense or past tense, guided inquiry approach as a strategy used in learning natural indicators, student discussions on material in everyday life.

Technology Content Knowledge (TCK) includes an understanding of the

technologies and issues that support and may affect other components (Elas et al., 2019). Examples: the use of Google drive which contains Student Worksheets (LKS) on natural indicator material, the use of prezzi and youtube in learning acid-base indicators, edmodo is used as a means to collect assignments about the present tense or past tense.

Technology Pedagogic Knowledge (TPK) is a set of insights into how learning changes occur through the use of technology, used to support active learning, and can support and simplify subject concepts (Kaarakainen & Saikkonen, 2021). TPK requires understanding the advantages and disadvantages of the required technology applied in the context of the subject matter that occurs in the learning process (Schmidt et al. 2009). Examples: The use of prezzi and youtube to facilitate guided inquiry in the present tense and past tense discussions, the use of Google drive containing Student Worksheets (LKS) to facilitate Project based Learning in the investigation of natural indicators.

Technology Pedagogy Content Knowledge (TPACK) is a collection of learning suites that integrate the ability to acquire technology that is inseparable from its components (C), (P), and (K). TPACK requires some interaction and combination between the components: domain, pedagogy and technology. According to (Putri & Adnan, 2020), the concept of integration is the involvement of various domains/components of material and pedagogy that can support Pre-service English teachers. Example: The use of

prezzi and youtube with guided inquiry strategies can help students understand the present tense material, the use of Google drive which contains Student Worksheets (LKS) with Project based learning strategies can help students solve and analyze the material provided.

Application of TPACK in Learning

The learning process designed by Pre-service English teachers aims to facilitate the learning process of students. In the learning development process, Pre-service English teacher students must be able to design learning by innovating learning innovations to improve and achieve learning objectives (Sarıçoban et al., 2019). One of the learning innovations that can be done by Pre-service English teachers and in accordance with 21st century skills is TPACK-based learning. (Habibi et al., 2019) tries to provide an overview of the practical application of TPACK in learning which includes 8 domains of TPACK application.

a. Using ICT to assess learners

Applications that can be done by Pre-service English teachers, for example, Pre-service English teachers can use Microsoft Excel to assess learning outcomes. Pre-service English teachers can use online quizzes to assess student participation. Pre-service English teachers can also use group chats to understand how to communicate through social media and so on.

b. Using ICT to understand learning materials

The application that can be done by Pre-service English teachers is to package learning materials that will be delivered by Pre-service English teachers through the form of learning videos.

c. Integrating ICT to understand learners

Applications that can be carried out by Pre-service English teachers, for example, Pre-service English teachers, can ask students to visualize their ideas using Corel Draw or Pre-service English teachers can use whatsapp or email to accommodate student complaints.

d. Integrating ICT in curriculum design as a policy

In practice, schools can involve Pre-service English teachers in developing digital learning resources such as making e-modules or learning videos. Able to carry out regular discussions on digital development, as well as create ICT improvement programs for Pre-service English teachers.

e. Integrating ICT for data presentation

Applications that can be carried out by Pre-service English teachers, for example, use ICT in presenting academic data. Such as, e-reports, student master data, student mutation data and so on.

f. Integrating ICT in learning strategies

The application is that Pre-service English teachers can use learning videos to motivate students. Pre-service English teachers can develop web-based learning, manage online discussion forums and conduct teleconferences to students.

g. Applying ICT for learning management

The application is that Pre-service English teachers can use ICT for online attendance, enter and process student scores, use academic information systems and others.

h. Integrating ICT in teaching contexts

Its application Pre-service English teachers can provide online-based learning options, create a learning environment that is rich in digital resources and utilize technology-based learning resources. Examples of ICT applications with the TPACK framework certainly need to be analyzed and reviewed by Pre-service English teachers and schools because each school has different conditions. So that the form of application of one school is not necessarily suitable for other schools.

The role of pre-service English teachers has changed to become a designer and facilitator of learning activities for parents and students to want to continue studying at home. Another change is that pre-service English teachers must prepare learning materials using digital applications on their mobile phones. Not only the development of the ICT field, the 21st century Pre-service English teachers are required to be technologically literate in the 21st century in the world of education (Zipke et al., 2019), especially the development of children from the

environment, namely child involvement, the use of effective learning strategies and emotional factors for Pre-service English teachers in supporting children's development.

Currently, ICT exploration has become a reference for education in an effort to develop a learning model known as TPACK (Technological, Pedagogical, Content Knowledge) (Wardani et al., 2020). TPACK itself is a framework for designing new learning models by combining three main aspects: technology, pedagogy and content/material knowledge (ontological). In the 21st century, ICT exploration from the perspective of Technical Educational Content Knowledge (TPACK) integrates the use of technology in different contexts by examining linking techniques, pedagogy, and the integration of ICT in the classroom. It has the advantage of demonstrating consistency in what you do. This framework has a well-established theoretical foundation.

21st Century Requirements

a. Critical Thinking and Problem Solving

Pre-service English teachers must be able to think critically, be independent, self-disciplined and improve their own thinking process. It requires effective communication and problem solving to overcome egocentric attitudes. Critical thinking means being able to express thoughts and reasons according to the situation, being able to make decisions and create solutions to solve problems.

b. Communication Skills

Communication is the process of conveying information, ideas, emotions using symbols, words, pictures and others so as to help evoke a response from the recipient. In communicating, it takes language that is easy to understand, respecting the opinions of others and explaining with a logical mind.

c. Creativity and Innovation Skills

Creativity is how productive thinking has an open and responsive creative mind. Thinking creatively means being able to come up with conceptual and practical creative ideas. If you experience failure, get up again and make it a learning experience and be able to adapt in new situations and make a positive contribution to the surrounding environment.

d. Collaboration Skills

Collaboration is a learning process that cooperates with one another to help and complement each other in carrying out tasks, being able to work together in groups and adapting. predetermined goals. Have the ability to work in groups and be able to adapt in various roles and groups.

So it can be concluded that 21st century learning must be able to utilize technology to achieve learning goals. For this reason, the readiness of educators is needed in planning, implementing and evaluating learning. In this regard, TPACK has a very close and basic connection which is very necessary for pre-service English teachers to face learning in the 21st century.

Pre-service English teachers have tried to design various learning activities for parents and students so that the

teaching and learning process can be made to the maximum extent possible. The challenges of the positive impact of the 21st century provide demands for pre-service English teachers to be "forced" to be technology literate in making learning design, implementation and assessment (Koh et al., 2018). In this case, one aspect of early childhood development that must be assisted by the pre-service English teachers is the physical motor aspect. The existence of various developments as a characteristic of the 21st century makes all pre-service English teachers have to teach with methods, materials and teaching methods using various technologies.

TPACK Challenges in 21st Century Learning

Pedagogic competence is very closely related to the didactic and methodical abilities that teachers must possess so that they can act as good educators and mentors. The tough challenge facing the world of education in Indonesia in a global complex is the ability of teachers to design teacher competency development plans, especially the TPACK aspect. The TPACK model is a comprehensive integration of knowledge and skills in terms of material and pedagogy integrated into technological developments. Pre-service teachers, especially English teachers, must have adequate TPACK competence, because TPACK is in the realm of competence, especially pedagogic competence and professional competence (Syahria et al., 2022). On the other hand, the demand for writing learning tools in carrying out learning activities must fulfill the constructivist aspect as well as integrate character and higher order thinking. Therefore, it is important to look more deeply at how competent Pre-service teachers are in designing lesson plans that are able to integrate various aspects such as higher order thinking skills (HOTS = High Order Thinking Skills) and TPACK. Learning plans that are able to oversee the learning process in class and directly implemented to students are Learning Implementation Plans (Lesson Plan) and Constructivist Student Worksheets (LKPDk). The format and content of the preparation of the RPP have repeatedly changed, especially in learning activities. Meanwhile, the demands for writing learning activities in lesson plans must fulfill the constructivist aspect as well as integrate character and higher-order thinking. On the other hand, based on the latest findings from Haryani et al., (2018); Syahria et al., (2022); Wardani et al., (2020) and Atar et al., (2019) regarding the preparation of lesson plans from Pre-service teachers and English, there are several weaknesses that stand out, namely: 1) difficulty writing down problems for various learning models, for example PBL and PjBL, 2) not thinking about prerequisite material , 3) the depth of the material, and 4) paying little attention to the relationship between observational data and data analysis

With good mastery of content, prospective teachers can also know or recognize misconceptions that occur in students, can choose which content is most important to teach and will not transfer their misconceptions to students. If the

ability to design learning tools can be possessed by student teachers/prospective teachers, then apart from the constructivist essence that is expected so far to be realized, HOTS and TPACK abilities according to CPL (Larning Goals) expectations for the education sector can also be realized.

In the context of mastering 21st century skills, learning English is seen not only for transferring knowledge and skills to students, but also for building HOTS. For this reason, students must be actively involved in learning activities to construct knowledge and engage in conceptual change. Through learning English, teachers can develop various learning models that meet constructivist aspects and are in accordance with the characteristics of English subjects and have dimensions of attitudes, knowledge, and skills. Conformity with the demands of the knowledge dimension, for example to encourage students' ability to produce works and solve problems. In its application, in 21st century learning, English teachers are advised to use Project-Based Learning and Problem-Based Learning models.

Opportunities of TPACK in 21ˢᵗ Learning

It is not enough for 21st century pre-service English teachres to only have knowledge of the material being taught and how to teach it. The latest developments in science, technology and art in the field of education require pre-service English teachers to also have knowledge of technology and its use in learning and teaching. The 21st century

teacher must have knowledge as well as skills in using various traditional and modern technological devices to facilitate learning and improve learning outcomes. Lectures related to educational technology provide the ability to design, develop, utilize, use, manage, and evaluate learning using various technologies as processes, tools, and resources in learning. The use of learning strategies that are part of lectures is an effort to integrate the development of TPACK in a lecture related to content. The use of learning strategies in all teacher education programs is a step towards more comprehensive integration of TPACK into the teacher education curriculum.

Pre-service 21st century English teachers are required to implement and be able to build effective relationships with students, parents and the community. Pre-service English teachers must be able to use technology to improve the quality of learning, as well as reflect and improve learning practices continuously (Agustini et al., 2019). But in reality, in the 21st century situation, where technological advances are an important point in the teaching and learning process, it becomes the main obstacle or challenge for Pre-service English teachers themselves, due to the lack of ability of Pre-service English teachers in understanding technology.

There are opportunities for pre-service English teachers to improve their professionalism in the 21st century by making efforts, namely being able to master the characteristics of students from the physical, moral, social, cultural, emotional, and intellectual aspects (Sindi, 2019). Furthermore, they are able to

master competency standards and basic competencies of the subjects/fields of development that are taught, and can utilize information and communication technology for the learning process. The 21st century also provides opportunities for pre-service English teachers to be more skilled at using technology to become planners and facilitators of student learning activities (Wardani, 2020). In addition, the collaboration between pre-service English teachers and good parents can make teaching and learning programs for students to continue well even though there are several obstacles that become challenges for pre-service English teachers.

In the face of the weak ability of pre-service English teachers in understanding technology, it was revealed that, many pre-service English teachers do not master information and communication technology (ICT) (Koh et al., 2018). Even if they master ICT, they are still at the level of pedagogic ability. Not to develop competence, that's why, we will increase training for pre-service English teachers in mastering information technolog, this is a challenge for educators in the 21st century.

The author adds, pre-service English teachers must be able to use technology especially in the 21st century. There is a significant influence of the background of the Pre-service English teacher which is still said to be unprofessional in the 21st century era (Wardani et al., 2020). However, on the side of pre-service English teachers, students respond to the phenomenon of low professionalism Pre-service English teachers themselves,

precisely because Pre-service English teachers lack mastery of teaching materials and applications used in the learning process which are currently less focused, so that it becomes a form of challenge for Pre-service English teachers in the 21st century today (Koh et al., 2018). Unfortunately, the impact of the rapid development of the 21st century makes pre-service English teachers afraid, especially teachers who already have an educator certificate as evidence that they have been certified by the Ministry of Education and Culture as professional educators.

Mastery of technology/application in learning by pre-service English teachers in the middle of the 21st century is very much needed so that pre-service English teachers can continue to teach professionally (Zipke et al., 2019). Therefore, the effectiveness of nowdays learning at educational institutions in the middle of the 21st century has not been effective. From the research findings that there are still pre-service English teachers who do not carry out learning in the middle of the 21st century. Some pre-service English teachers running online learning have already paid attention to the daily learning implementation plan (RPPH) that has been made so that learning indicators can be measured. There are still many pre-service English teachers who are not proficient in using online learning applications. The learning method used is still dominant in giving assignments to students.

It aims to provide awareness to pre-service English teachers that current

learning which is the impact of 21st century technological advances requires pre-service English teachers to have high skills and professionalism in teaching, because pre-service English teachers are required to implement and be able to build effective relationships with students, parents and the community, pre-service English teachers are able to use technology to improve the quality of teaching, as well as reflect and improve learning practices continuously.

Conclusion

TPACK is one of the new types of knowledge that aspiring English teachers need to acquire in order to successfully integrate technology into their learning. Within the TPACK framework are the English teacher's three components of knowledge: subject matter, pedagogy, and technology. TPACK can be used as a framework for designing curricula for preschool English teachers that are aligned with the 21st Century Learning Skills Age and Guidelines. For this reason, preschool English teachers should understand that using the TPACK framework is part of their effort to transform themselves into characters. The perfect candidate for a fun English teacher who can adapt to her digitally 21st century situation.

The English teachers needed in the 21st century must not only be comfortable with their academic skills, but also be able to interact with the communication technologies available around them. In other words, future English teachers of this century must be prepared to provide technology-enhanced learning opportunities for their students and recognize how technology can support student learning. is needed. 21st century skills that future English teachers must possess are also a challenge for the world of national education in Indonesia. Learning English not only imparts knowledge and skills to future English teachers (knowledge and skill transfer), but also helps build HOTS. For this reason, future English teachers must be actively involved in learning activities to build knowledge and engage in conceptual change. Integrating English with technology for learning allows us to develop different learning models that justify constructivist aspects and respond to the characteristics of the material. In addition, future teachers should also have the ability to integrate TPACK into their written learning designs. Trainee teachers are expected to be able to integrate technologies, materials and pedagogies that interact to enable ICT-based learning.

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