WHY AND HOW: EXPLORING ENGLISH EDUCATION STUDENTS' TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPCK) DURING TEACHING PRACTICE

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Abstract

This study aims to explore English education students as candidate teachers for their technological pedagogical content knowledge (TPCK) during teaching practice. There have been studies investigating TPCK for teachers and candidate teachers. However, very few have explored the issues regarding the importance and ways of candidate teachers exploring their TPCK during teaching practice. The purposes of this study are (1) to explore the importance of TPCK for English education students in their teaching practice and (2) to explain how they integrate TPCK into their teaching. Data were gathered using research techniques such as questionnaires, documentation checklists, and one-on-one interviews. The study reveals that candidate teachers must prepare the TPCK framework before they do the teaching practice. They will get experiences from lecturers and peers exploring their TPCK to their lesson plans and teaching practices. They can integrate the knowledge of technology when delivering material (content knowledge) and explain it using proper teaching methods (pedagogical knowledge). These activities start with deciding learning objectives, designing assessments, and implementing detailed teaching steps. Additionally, it was discovered that when the lecturer inquired about any difficulties they had creating and carrying out a lesson plan based on TPCK, they felt both ashamed and terrified. When they first have conversations with their peers, they are happier. Moreover, lecturers must provide students with more encouragement so that they become better teachers. The study indicates that more investigation is necessary to understand how peers contribute to their learning of TPCK and recommends more studies on peers' contributions to TPCK.

Keywords – TPCK, Teaching Practice

Introduction

Education in the Society 5.0 era involves changes in how we learn, teach, and prepare for careers in the future. This is evident in how big data, the internet, artificial intelligence, and other technologies have been applied and integrated, changing how people communicate and work. Thus, technology plays a major part in how teachers apply in the classroom. Technology use in teacher education programs primarily aims to help teachers grow as educators and improve the educational experience for upcoming students (Dogan et al., 2021).

The current teaching practices are integrated into the teaching knowledge framework of Technological Pedagogical and Content Knowledge (TPCK), Higher-Order Thinking Skills (HOTS), communication, collaboration, critical thinking, creativity (4C), and literacy competencies. Several critical twenty-century skills must be achieved, such as problem-solving, communication, collaboration, information and media literacy, critical thinking, and creativity (Lambert & Gong, 2010). Teachers must possess material and pedagogical skills and the ability to combine these elements with technology (Agustini et al., 2019).

Technological Pedagogical Content Knowledge, or TPCK, is a helpful conceptual framework for analysing, assessing, and defining what educators must understand to incorporate technology

into their lesson plans (Mishra & Koehler, 2006). TPCK is essential for becoming a Professional Teacher, and reflective practices can be useful for improving in-service teachers' TPCK.

The TPCK framework emphasises both knowledge of content (CK) about the discipline or subject matter and knowledge of pedagogy (PK) about how to manage, instruct, and guide students (Mishra & Koehler, 2006a). Technological knowledge (TK) also concentrates on particular hardware, software, and tools. That knowledge, therefore, is combined into pedagogical content knowledge (PCK), technological content knowledge (TCK), and technological pedagogical knowledge (TPK).

TPK, PCK, and TCK form TPCK, which describes the complicated relationships between all knowledge domains. Moreover, the basis of effective teaching using technology, TPCK calls for an awareness of how concepts can be represented technologically and pedagogical strategies that employ technology to teach the material (Koehler & Mishra, 2008).

Current educational practices increasingly incorporate computer tools and technological applications into curricula. Integrating knowledge of subject matter, teaching/learning, and technology has become essential due to the rising demands of students who now need to learn with technology. Consequently, understanding technology, pedagogy, and subject matter is now a crucial component of teacher education programs that prepare pre-service teachers to effectively use technology in their teaching (Koçoğlu, 2009). Moreover, having a strong TPACK when teaching EFL is particularly important. In the present day, communicative language instruction has been acknowledged as a more effective approach to teaching English for communication (Bygate, 2001) as cited in (Liu et al., 2014). However, this objective can only be achieved in the classroom with the strong support of technology.

A strong TPACK requires EFL teachers to expand their professional knowledge across various teaching stages, including curriculum planning, implementation, and evaluation (Coppola, 2004). They must also be proficient in creating lesson plans incorporating language learning software and internet resources. Additionally, they need to manage the complex interactions between technology, content, and pedagogy and develop suitable, context-specific strategies and representations (Harris, Mishra, & Koehler, 2009).

Teachers need to be well-versed in various pedagogical approaches and adept at utilising ICT to foster the development of their students' 21st-century skills (Voogt et al., 2013). Septiyanti et al. (2020) supports this statement, emphasizing that modern classrooms must prioritise technology as a fundamental component of 21st-century learning. As such, English teachers today must possess the skills to integrate technology effectively into their teaching practices, as failure to do so may render them outdated (Bugueño, 2013).

Relating to several studies on TPCK and its importance during teaching practice, this study has two research questions:

a) Why should English education students master the framework of TPCK in their teaching practice?
b) How do English education students integrate technological pedagogical content knowledge (TPCK) into their teaching?

The objectives of the study, therefore, arise to (1) explore the importance of TPCK for English education students in their teaching practice and (2) explain how English education students integrate technological pedagogical content knowledge (TPCK) into their teaching. Hopefully, this study will help teachers or candidate teachers know when

and how to use technology in teaching and choose the appropriate technology to maximise students' learning and achievement.

Methodology

This study used a case study design. The subjects were 20 English education students prepared to be professional teachers, consisting of 14 female and six male students. Data were gathered using research techniques such as one-on-one interviews, document checklists, and questionnaires. The interview instrument was given to explore the importance of TPCK in their teaching practice. A document checklist and questionnaire were provided to see how TPCK was implemented in their lesson plan and teaching. Thematic analysis was used to analyse the data. The stages of a thematic analysis include gathering and organising the data, transcribing it, getting to know the data corpus, memoing it, coding it, creating categories and themes from the underlying coded sections, and ensuring that the analysis process is transparent (Lochmiller and Lester's, 2017).

Finding and Discussion

The importance of TPCK for English education students in their teaching practice

According to the study's findings, 85% of respondents believe that teachers should be knowledgeable about TPCK based on students' opinions about its significance in learning activities. This is because pedagogy, technology, and subject matter knowledge are now crucial to their instruction. They can easily and clearly communicate the subject by including films or PowerPoint presentations.

The point is that technology is a big part of learning in the modern digital age. 100% of respondents agree with this statement. In further interviews, this is important because there is easy access to important information, and the learning process will be more effective and efficient. Students will also understand more easily because there are interesting tools.

92% of responses agreed that teachers and prospective teachers must master TPCK and apply it in learning. This is because the TPCK framework is very important for teachers to master. After all, through mastering TPCK, teachers can deliver material consistently, adapt it to teaching stages, and integrate it with appropriate technology.

Moreover, the importance of TPCK in supporting learning certainly needs to be supported by adequate mastery of technology for teachers. Technology tools or applications that are mandatory and important for teachers to master in learning include Google Classroom, Kahoot, Quizlet, Padlet, and many others. Apart from that, the media used to explain the material, such as Canva and PowerPoint, are still very necessary because they will help teachers explain the material and make students understand it. A simple tool usually used to carry out evaluations is Google Forms.

They believe that teachers who have a strong TPCK can select technology based on the needs of their students and schools, use technology to provide content in a way that is interesting, participatory, and relevant, set up educational tasks that make use of technology to enhance students' comprehension and abilities, employ instructional techniques that are appropriate for the traits and learning requirements of your students, achieve learning objectives while utilising the right technologies, and use technology to efficiently and effectively analyse and evaluate learning.

Based on the results above, we can conclude that a teacher or prospective teacher needs to have TPCK to carry out the learning process well. TPCK can be seen from the way a person prepares a learning plan and applies it in learning.

The integration in TPCK and their teaching

The findings of English education students who integrated TPCK into their teaching can be seen in their lesson plans and teaching. The lesson plans or instructional modules were analysed into six components: *goal and purpose, statement of the content, list of materials, set of procedures, the use of technology, and plans for evaluation.*

There are learning objectives and outcomes in the goal or purpose aspect. In implementing TPCK, integrating technology and knowledge of pedagogy and content can show a relationship between learning outcomes and learning objectives in preparing goals and purposes. Although they also still encounter difficulties in arranging learning objectives, it was found that students tried to state learning objectives with clear information about the audience, behaviour, condition, and degree to be achieved during the learning, as well as use familiar technology such as Canva and PPT applications.

An essential component of every lesson plan design is the "statement of content," which comprises multiple essential aspects. The module must include educational units, classes, semesters, academic years, subjects, and the number of meetings. These justifications can offer a clear framework for lesson plans, guaranteeing that all components crucial to organising and carrying out instruction are considered.

The lesson plan gets more organised by going over each of these topics. Additionally, an outline of the education undertaken to develop critical thinking abilities is given in this part. Critical thinking requires the capacity for in-depth information analysis, argument evaluation, and evidence-based decision-making. Teaching modules can do this using case studies, open dialogue, problem-solving, collaborative projects, and the appropriate use of technology in the classroom. These instructional techniques inspire students to challenge presumptions, consider many viewpoints, and develop original answers.

The lesson plan designed by students meets these points by designing learning activities that support student-centred learning, train students' critical thinking skills, and integrate with technology. Moreover, the learning content used by students in designing learning follows their needs and characteristics, ensuring that the material presented is relevant and effective in supporting their learning process.

In this third aspect, some students have designed the material in the lesson plan systematically and structured, avoiding overlap. In addition, the tasks given in the material taught are designed to encourage students to seek more information from various sources. This approach enriches students' understanding and develops independent learning skills. In this way, students can be more active and involved in the learning process, improving the quality and effectiveness of the learning provided. However, most students have not implemented the points in this third aspect, so the value or points for this aspect are still lacking or only reach a sufficient level.

However, in other points included in the list of material aspects, students prepare their lesson plan with material or content that reflects daily events. The material is presented attractively through text, images, and illustrations that align with technological developments. This aims to make learning more relevant and contextual so students can easily understand and apply the knowledge gained in real life. In addition, using various media helps attract students' attention and increases their involvement in learning.

For example, the recount text material he prepared discussed the holidays taken by their students as content in the learning material. Students asked

questions related to holidays. The use of image or video media in learning can be seen in the example of a student teaching module that provides learning about narrative text. Students design teaching modules by displaying videos, several images, and interesting PowerPoint presentations.

In terms of procedures, the teaching plan must include three main elements: opening activities, core activities, and closing activities. Although most students have designed these parts well, several important aspects are often overlooked. One is the delivery of competencies students will achieve at the beginning of learning. This is important to provide a clear picture of the learning objectives. Also, checking students' initial abilities through tests or assessments often goes unnoticed. It is important to know the student's initial level of understanding so that it can be adapted to the material that will be presented.

Some students have not designed learning according to the chosen learning model and its syntax at the main activity point. The learning model has a structure and certain steps to follow to ensure the learning process runs effectively and achieves the expected goals. The learning process can become less focused without following the correct syntax, and the learning objectives will be difficult to achieve. Therefore, it is important for students not only to choose an appropriate learning model but also to understand and apply the steps or syntax of that model correctly in their learning design.

In addition, students have designed teaching modules by integrating TPCK/TPACK into their learning. This demonstrates a good understanding of TPCK implementation, ensuring that technology, pedagogy, and content support each other to increase learning effectiveness. Examples of using technology include presenting material in the form of attractive power points and presenting several learning videos. Students are also quite good at implementing pedagogical elements in TPCK, such as implementing appropriate teaching methods, planning student-centred learning, and making assessments to assess student activities.

Several points must be included in the plans for evaluating aspects in the design of teaching modules, namely that there are equipment instruments to assess learning outcomes, including knowledge, skills, and attitudes, tasks used to assess the quality of learning carried out, and assessments carried out by designed learning objectives.

Some of the points mentioned above are often overlooked in student learning planning. The designed teaching modules often do not include an assessment of students' attitudes. In addition, the tasks used to assess the quality of learning often do not match the learning objectives. For example, suppose the learning objective is for students to be able to identify the linguistic elements of recount text. In that case, there are often no activities or tasks that show that students carry out this identification. This shows the importance of consistency between learning objectives, learning activities, and assessments in the designed teaching modules.

Through activities between lecturers and peers, students have effectively explored their TPCK in their lesson plans and teaching practices. Before conducting a teaching session, they must decide what learning objectives are based on students’ needs and characteristics. After that, assessments should be made to achieve the learning objectives. They integrated technology such as video and Canva to implement detailed teaching steps. In addition, it was discovered that when they had conversations with their peers, they were happy and enjoyed themselves since they were not afraid. They were very happy when the lecturer allowed students to practice with friends and rewarded them after practice.

Conclusions

This study demonstrated that candidate teachers had to be equipped with TPCK to enhance their instructional strategies. Given the significance of TPCK in the classroom, students should broaden their knowledge of technology, pedagogy, and subject matter by discussing their lesson plans and teaching with peers or lecturers, finding information on the Internet, and using teaching media. By giving precise instructions on everything from setting learning objectives to organising teaching stages, creating evaluations, and using teaching media, they may incorporate the TPCK framework into their lesson plans and methods.

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