Designing digital storytelling books for TPACK development of Indonesian pre-service ELT teachers

Tifani Yuris Signori✉1, Nur Arifah Drajati1, Kristian Adi Putra2

1Universitas Sebelas Maret, Indonesia
2Prince Sattam bin Abdulaziz University, Saudi Arabia

Article Info

Abstract

In today's educational system, the need for teachers to acquire technological, pedagogical, and content knowledge (TPACK) has already become a mainstream transformation. Therefore, it is necessary to find a suitable strategy and approach to develop pre-service ELT teachers' TPACK, in which one of them is actively engaging them in the design of technology-enhanced learning. This study sought to investigate Indonesian pre-service ELT teachers' TPACK level development after designing digital storytelling book. Narrative inquiry was adopted in this research. The data were obtained from the pre- service ELT teachers' reflective notes and semi-structured interviews. The findings of the study show that all participants are in the TPACK level of "accepting". In the level of accepting, pre-service teachers form a favorable attitude toward teaching and learning English with digital storytelling. The implication derived from this study is that it is necessary to carefully design a project in teacher education program that can improve the pre-service teachers' TPACK level.

INTRODUCTION

The ongoing development of technologies has made them more accessible for education (Lai & Bower, 2019). Therefore, the knowledge that teachers are expected to possess does not only include pedagogical knowledge related to principles, classroom strategies or simply knowledge of the scientific field they teach, but they are also expected to manage effective teaching using technology (Asad et al., 2020; Ghavifekr & Rosdy, 2015). However, not all teachers can handle and incorporate technology into the teaching-learning process since successfully integrating technology into the teaching of specific subjects is a complex endeavour (Herring et al., 2016). Therefore, globally, teacher education programs now prioritize developing teachers' TPACK (Voogt et al., 2013; Wang et al., 2018).

To enhance the pre-service teachers' TPACK competence, creating digital story is one of the potential ways (Sancar-Tokmak et al., 2014). It is because in implementing digital storytelling, teachers must also have the knowledge of technology, pedagogy, and content (TPACK) and an understanding of the multimodal nature of digital texts and environments (Gregori-Signes, 2014; Shinas & Wen, 2022). Over years, digital storytelling (DST) has been employed as a method for teaching English skills including vocabulary, spelling, punctuation, and verb tenses (Del-Moral-Pérez et al., 2019). As a result, DST seems to be a suitable solution for teachers to meet the need of engaging instructional techniques for teaching English (Yang et al., 2020). In the teacher education setting, pre-service teachers gain benefit from the chance to design and produce digital storytelling book as its process includes thinking about how to engage their target students' reading habits and include them in the development of authentic content creation (Ozüdogru & Çakir, 2020). Therefore, digital storytelling is being used more frequently to help pre-service teachers develop their digital literacies and skills (Shinas & Wen, 2022) and to prepare them to integrate technology into the classroom better (Cetin, 2021; Kirikci, et al., 2020).

Related to this context, Yuksel-Aslan (2013) has indicated that TPACK is related to the digital storytelling creation process: subject matter selection is CK, message selection is PK, scenario writing is PCK, selection of materials is TPK, software use is TK, story board creation is TCK, and all of the creation process is TPACK. Yuksel-Arslan (2013) explained the relationship between TPACK domains and each step of the digital storytelling creation process: 1) Subject matter selection: Subject matter selection for creating digital storytelling is related to the CK domain; 2) Message Selection: An appropriate message selection for students' level is related to the PK domain; 3) Scenario Writing: PCK includes knowledge about the practice applied to teach a specific content; 4) Material Selection: This step includes selection of visual and audio materials in line with the scenario and target student level. TPK is in line with this step since TPK is knowledge about how the technology affects or supports the selected pedagogy; 5) Story Board Creation: The storyteller creates a storyboard using TCK, which is about how content can be represented by technology; 6) Software Use: In this step, the storyteller prepares the scenario and materials and decided the pace of the narrative. The only thing to do in this step is to use software to create digital storytelling book which is also in line with TK domain; and 7) Digital Storytelling: The whole complete process is called digital storytelling creation and requires the storyteller to use TPACK.

Hsu (2012) emphasized the significance of the structure of teacher preparation programs and how they relate to professional placements for the development of TPACK. In addition, a good structure might include general TPACK development in the program and context-specific TPACK knowledge development prior to and during the professional placement (Hsu, 2012). Furthermore, the pre-service teacher preparation program requires "many opportunities to observe, practice, and reflect on student-centred, technology-enriched lessons" in addition to an integrated and continuous focus on learning and teaching with information and communication technologies (ICTs) across the curriculum (Sutton, 2011, p. 44).

As a result of teacher education and training program, there are five levels to describe the TPACK development process of the teachers (Niess, 2015). Those levels include (1) recognizing: where teachers are able to use technology and recognize an alignment of the technology capabilities with the content knowledge; (2) accepting: where teachers form a favourable or unfavourable attitude toward teaching and learning of specific topics of subject matter with technology; (3) adapting: where teachers engage in and implement in their classroom activities that lead to a choice to adopt, or reject teaching and learning topics of subject matter with technology; (4) exploring: where teachers integrate technology as learning tools, when teaching and learning of multiple topics of subject matter, and where they consistently explore opportunities to use technology as learning

tools in content topics; and (5) advancing: where teachers evaluate students' understanding using technology as learning tools and where they actively support the decision to integrate teaching and learning the specific topic of subject matter with technology.

Most previous studies on DST only frame the use of digital storytelling to teach pre-service teachers in their education programs as well as their preparation to teach using DST in the future classrooms (Islim et al., 2018 Ozüdogru and Akir, 2020; Shinas & Wen, 2022). Meanwhile, related to the use of digital storytelling done by teacher educators in pre-service teachers' TPACK competence training, several researchers have done studies in that context (Kukul, 2023; Wang, 2016). However, studies which focus on how designing digital storytelling book develops the pre-service teachers' TPACK competence is still underexplored. Thus, this study explored the pre-service teachers' TPACK level development after designing digital storytelling book. Teachers' TPACK development level framework by Niess (2015) namely recognizing, accepting, adapting, exploring, and advancing was used in this study to determine the pre-service teachers' TPACK development.

METHODS

The present study applied narrative inquiry because the aim of this study is suitable with the purpose of narrative inquiry which is to understand how pre-service teachers as the participants 'organize and reflect' their experiences (Barkhuizen et al., 2014). This study was conducted at Digital Literacies and Language Education course in the faculty of teacher training and education of a university in Central Java, Indonesia.

This study involved three pre-service ELT teachers named Dewi, Ambar, and Wati (pseudonyms) who have narrated their experiences after designing digital storytelling book in the course project. The age range of the participants is 24-26 years old. They were included as the participants in this study because they were the leaders or coordinators of the groups. The pre-service teachers were divided into three groups, therefore there were three group leaders and three of them were willing to be the participants of the study. Coincidentally, all pre-service teachers who take part in this course activity are female. All of them were pursuing their master's degree in ELT. Both Dewi and Wati have been teaching English informally as tutors for 2 years. Meanwhile, Ambar has not been teaching English at all. Her only experience of teaching English is only 3-month-internship which she did when she was an undergraduate student.

In this study, the researchers followed the ethical guidelines prepared before conducting the study to maintain the partnership between the researchers and the participants until the study was completed. Before conducting the study, the researchers asked for the gatekeeper's permission, in this case, the teacher educator or lecturer. After getting permission, the researchers explained the study conducted to the pre-service teachers directly. After they got the understanding about the study, the researchers offered them a consent letter through *WhatsApp.* Therefore, the pre-service teachers could decide whether they want to participate in the study. The researchers briefly described her study in the consent letter, just in case the participants need further convincing. Furthermore, the researchers stated in the consent letter that they would uphold the confidentiality and privacy of the participants. In this study, the researchers adopted pseudonyms to protect the participants' identities to prevent those identities from being found or identified by others.

Table 1. The profile of the participants

No	Name	Age	Gender	Educational background
1	Dewi	24	Female	English education
2	Ambar	25	Female	English education
3	Wati	26	Female	English education

The data collected in this study was in the form of stories retold by the pre-service teachers. Therefore, to collect the data, reflections and semi-structured interviews were used to collect the data in the present study.

Reflection: Pre-service teachers were asked to write one reflective note after completing their whole activity. Reflections or reflective notes were formed with narrative frames. Narrative frames were used because they offer direction and support regarding the organization and content which should be written (Barkhuizen & Wette, 2008). Therefore, the researchers also provided

some guiding statements to make the pre-service teachers easier in completing the reflection. However, the pre-service teachers were still advised to retell their whole story and reflect on their overall experience. This reflective note was taken once. The researchers sent the files of formatted reflective notes through e-mail and *WhatsApp.* All participants sent back the reflective notes which they have filled completely to the researchers in 2-3 days.

Semi-structured interviews: Semi-structured interviews were conducted online through Zoom Meeting with three pre-service teachers who have recalled detailed experiences after reflective note was taken. The questions asked in the interview were related aimed to explore pre-service teachers' experiences in designing digital storytelling book and their TPACK level development after completing the activity.

The guiding statements of the reflective note and questions of semi-structured interviews were formed by considering both theories of the relationship between TPACK domains and each step of the digital storytelling creation process by Yuksel-Arslan (2013) and TPACK development process by Niess (2015).

Thematic analysis involving a careful and systematic sorting of the interview was used for the data analyses of interview data. The data analysis included a series of processes including familiarizing with the data, generating initial codes, defining and labeling themes, and producing the report. In the beginning, themes were created from the research questions; however, the researcher had to move back and forth between the data and its codes and categorize forms to develop themes and theoretical relationships (Barkhuizen et al., 2014, p. 76). In analyzing the data in this research, the researcher coded and categorized the participants' stories under several specific themes related to their experiences. Afterward, the researcher described, narrated, and reorganized the participants' stories sequentially and thematically.

FINDINGS AND DISCUSSION
Using DST book in my future class because it is beneficial
Before designing DST book, Dewi explained that the pre-service teachers were asked to join a workshop of designing digital stories organized by the teacher educator. In the workshop, the pre-service teachers conveyed that they received the detailed explanations from an invited expert about how to design digital storytelling book in English.

> "I got an explanation regarding examples of steps on how to design a digital story by joining a workshop organized by my lecturer, Mrs. X. The expert of digital story in the workshop is Prof. Y" (Dewi)

The expert demonstrated directly on how to arrange digital storytelling from the scratch on the workshop. The pre-service teachers watched the process step by step as the expert explained. The expert gave example by creating digital story entitled "The Sunflower Seeds" directly from the cover until the last page of the story.

> "The expert of the workshop specifically demonstrated how to create scenario of digital story. At that time, he gave example by creating digital story entitled "The Sunflower Seeds". He started from creating the cover until writing the last page of the story. We watched the steps from beginning to the end." (Dewi)

He told the pre-service English teachers that they may use several application, software, and tools for editing digital stories. He also gave example how to make hyperlink for video. Moreover, he shared a blog which contains several links of webs or software which can help them to edit the images and the pictures for digital stories. For audio, he suggested google voice over and bigspeak.ai. Meanwhile, for images, pre-service teachers can use Autodraw.

> "Well, so the expert initially shared a blog which contains links of webs, software or application to help us creating digital story. As I recalled my memory, the expert demonstrated directly in the workshop on how to use several applications such as Google voice over, bigspeak.ai, and Autodraw if I am not mistaken." (Dewi)

Dewi also added that her group decided to write a fable since it is in the syllabus. Moreover, she and her group also have opinions that the topic related to fable is interesting, suitable for the level of their targeted students, and simple to design into a digital storytelling book. During the planning process, the teacher educator (the lecturer) also monitored their works by asking and making sure that the topic suits the syllabus and the level of target students.

> "After discussing together, my group decided to choose a digital story topic related to fable. We decided to choose the topic because it was interesting, suitable for the level of the targeted students and easy to make into a digital storytelling book. The lecturer also agreed on our topic after checking and confirming that fable is in the syllabus." (Dewi)

In designing the DST book, Dewi's group faced several the technical problems. Dewi stated that she intended to put the narrators' sounds as well as the background sound together in one page but it did not turn out well. It also happened with the character dialogue which cannot be played together with the background sound.

> "During this design process, we experienced difficulty in which we cannot play the background sound at the same time as the character dialogue audio in the digital story." (Dewi)

From Dewi's experiences above, she felt that she has understood well about the use of digital story in teaching after learning about and designing one. In her perspective, she may use digital story as a media to deliver the materials to her students in the future classroom.

> "I already understand the use of digital storytelling book for teaching English. I think I can use it as as a learning medium so that I can deliver my materials easily" (Dewi)

Furthermore, after finishing the DST book project, she also has an idea that digital storytelling book can be a learning product produced by students in a project because she was inspired by how the teacher educator arranged the project and made DST book as the product or artifact that became the students' learning outcome.

> "After finishing this DST project, I think that I might also use DST book as a learning product in the future. It will be good if my students are included in a project where they produce digital storytelling book" (Dewi)

Related to the attitudes towards the use of Digital storytelling book in teaching English, she conveys that she builds a positive attitude towards it. She agrees that digital story can help her to deliver English lesson in class. She also thinks that digital story has many benefits for students. It can facilitate them to obtain English skills since they can speak, write, and read in using digital story. Moreover, if the students use Book Creator account, they might also learn to work collaboratively in different time and places. Therefore, Dewi thinks that digital story is helpful, fun, and able to keep students' learning motivation.

> "I agree that digital storytelling book can help me as a teacher and are suitable for use in delivering lesson in the English class. In my opinion, Digital story can facilitate all students' skills because they can add their own voice, write, and if they look for sources beforehand it can also facilitate reading. So, I think it's flexible and can be used for many English skills. Digital story, if using the bookcreator account, also increases student collaboration because it can be opened on several devices at once if they want to work in groups that work together at different times and places. I think that's really helpful and fun too, it can keep students motivated." (Dewi)

However, Dewi has not adapted DST yet in her classroom because she thinks that DST is not suitable with the teaching materials which she taught in her teaching practice. Furthermore, since there is not any step of teaching practice in this project, the teacher educator only suggests and encourages the pre-service teachers to practice DST outside of the classroom. Dewi, however, conveys that in teaching the students of her private English course, she has not found the suitable teaching materials to implement

DST. Nevertheless, she strongly believes that she will try to adapt DST that she has learned in the project to teach her future English classroom because she found that DST will be so interesting for students and can be a media for students to collaborate.

> "After learning about digital storytelling and how to design the digital story, I have decided to try to adapt DST in my future English classroom because I think it is interesting and has a potential to be the media for the students' collaboration." (Dewi)

Dewi's statements that digital storytelling book can help her as a teacher to deliver materials as well as become a learning product produced by students in a project show that she is in the TPACK level of accepting digital story to teach English. It is in line with the statement of Niess (2015) that in accepting level, teachers know of the technologies that can be used in their courses and have a general positive or negative attitude about using the technology or not. In this case, Dewi has positive attitude about using digital storytelling.

Keeping my future students engaged by using The DST book
Slightly different from Dewi's experience, Ambar stated that besides workshop, the pre-service English teachers also received examples, demonstration, and follow up explanations directly given by the teacher educator in the next meeting of class.

> "We were asked to join a workshop about Digital Storytelling by our lecturer. After joining workshop, we also got examples of the steps on how to create digital stories through our lecturer's demonstration in the next meeting of class." (Ambar)

During the process of designing, the pre-service teachers also obained feedbacks from the teacher educator. The feedback was constructive so that the pre-service teachers could revise their digital stories based on the feedbacks. The teacher educator's feedback regarding the designs were mostly about the number of pages and the use of animations to make the designs look more attractive.

> "The lecturer gave feedback regarding our design that our design is already pretty good, but it would be better if we add more pages and animations to make it more interesting." (Ambar)

In reflecting the process of designing and the results, Ambar stated that she needs to work on their visual of the designs more. She agreed that in their future class, she wants to improve the visuals of designs by adding more various aspects such as animations and videos into the designs so the DST book can be more interesting, creative and interactive.

> "In my opinion, what I can improve or improve in designing digital stories for teaching in the future is to be more creative in choosing image and animation designs and including supporting videos so the digital story can be more interactive." (Ambar)

When explaining her understanding about the use of DST after going through the process of designing one, Ambar gave a specific example about the use of DST as a media to enhance the students' listening skill. It is because she thinks that in designing digital storytelling book, she may input the audio of a native speaker narrating the stories that can improve the students' listening skill.

> "By using the stories narrated by a voice of native speaker from the tools, I think digital storytelling book may stimulate the students' listening skill." (Ambar)

When talking about how to use DST to teach topics and skills in English, she gave an example that the most important thing is that to select an appropriate story board which suits the materials and target students' level of understandings well.

> "I already understood about how to use digital storytelling book to teach English skills. For me, choosing the appropriate story board which suits the materials and the level of students' understanding is the most important thing to do" (Ambar)

After designing DST book in the project, Ambar also builds a positive attitude towards the use of DST in English class. She stated that digital storytelling book is suitable medium to be used in teaching English because they can attract students' attention and keep them engaged. Moreover, she also conveyed that by using digital storytelling, the students can also practice their information and communication technology (ICT) skills.

> "I agree that digital storytelling book can help me to teach. They are suitable to be used to deliver English lessons because they may attract students' attention, keep them engaged and make them practice their ICT skills as well." (Ambar)

In Ambar's case, she has not implemented DST in her class because she has not taught yet at all. However, along with the lesson plan she has arranged, she seemed to already has a structured plan related to how implement DST in her future classAmbar's TPACK is still also at accepting level. However, Ambar tended to view digital storytelling as a motivating factor for engaging students in the topics rather than as a tool for learning English. It is in line with the finding of a study done by Niess (2013) that sometimes, at the accepting level, pre-service teachers tended to view the technology as a factor that can motivate the students instead of a main tool for learning English.

Using the DST book to teach reading skill in the future
Based on Dewi's experiences, first of all, the pre-service teachers were given explanation that digital story is suitable to be used as English teaching materials because it can improve the students' engagement since it is interactive. Moreover, it was also explained that digital story can be designed using several kinds of technology by considering the targeted students' needs.

> "I received an explanation that digital stories are suitable to be used in learning because they are interactive media which can improve students' engagement. I can also use any technology which suits my students' needs" (Wati)

Wati personally finds the explanation given by the expert regarding DST book and how to design it is insightful and interesting. The expert of the workshop explained that the pre-service teachers could input the images and the audio which are already provided in the Book Creator application or from their devices in creating DST book. Moreover, he also gave tips and suggestions on how to avoid copy rights from the chosen images.

> "This is very interesting. I really got insights from the expert of workshop. The way he explained how to use book creator explanation is very detailed. He even explained how to choose the image and the audio there. There were also some recommendations of how to avoid copy right because of our chosen images." (Wati)

In the process of constructing DST book, Wati's group developed their own method to make outline before finally jumping into the Book Creator App to design it. They made outline by using table matrix. On each column, there are pictures followed by the suitable narratives that will be included in digital stories.

> "In my case, my group decided to make a table matrix. So, on each column, there will be the picture as well as the narrative." (Wati)

After going through the steps of designing DST book, Wati is confident that their designs of digital story would result in the desired outcomes of learning in their future class because she thought that their designs were already interesting, interactive, and suitable for targeted students' level.

> "I am sure that our design of digital storytelling book will produce the targeted learning outcomes because it is already interesting and interactive. It also already suits the students' level." (Wati)

Wati also shares her understanding about the use of digital story and how to use it in teaching English by referring to the lesson plan she made based on the digital storytelling book she designed.

Therefore, she talked about its use in reading and how to teach it to students. She conveyed that in her lesson plan, she used digital storytelling to teach reading with the topic of narrative text. In her opinion, digital story is really useful to explain the structure of narrative text as well as the storyline to the students.

Besides, similar with other pre-service teachers, Wati also has a positive attittude towards the use of DST in teaching English. She conveys that DST can increase students' motivation and creativity in learning, especially in reading.

> "I agree that digital storytelling book can help me as a teacher. I think that they are suitable to be used in teaching English because they can increase students' learning interest and students' motivation to learn reading creatively" (Wati)

Although having positive attitude toward DST, Wati has not thought about implementing DST in teaching English yet. It is because first, she thinks that DST will be most beneficial and suitable if it is used to teach reading. However, she has not had any chance yet to teach reading skill to students using DST.

Considering the data obtained from Wati, it can be seen that she is also at accepting level. The way Wati thinks that digital story is suitable to be used in teaching reading is in line with the finding of a previous study done by Niess et al. (2014). In their study, the teachers' conception was to use the technology for motivation to study only specific topics.

CONCLUSION

The results of this study show that in TPACK level development, each of the pre- service teachers was experiencing the same level which is accepting although they had slightly different experiences in designing digital storytelling book and finishing the project. It can be said that the activities in digital storytelling book project did not support the pre-service teachers in achieving the full TPACK level development: recognizing, accepting, adapting, exploring, and advancing. However, the TPACK of pre-service teachers was a bit developed after designing digital storytelling book.

Although the primary findings show that the pre-service teachers' TPACK was developed until the accepting level, their TPACK development seemed not significant during the project. Therefore, it is necessary to carefully design a project in teacher education program that can improve the pre-service teachers' TPACK level. In using DST book project in the context of teacher education, it will be beneficial for teacher educators to provide pre-service teachers with chances of direct teaching practice so that they can explore more to really apply digital storytelling book in teaching after getting the chance to design it. By having the opportunity to directly apply DST in the teaching, pre-service teachers may have bigger chance to develop their TPACK into the other levels.

FUNDING STATEMENT

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