การศึกษากระบวนการเล่าเรื่องแบบดิจิทัลของนักศึกษาครูช่างอุตสาหกรรม ในกิจกรรมการถ่ายทอดผ่านนวัตกรรมสื่อสร้างสรรค์

A Study of the Digital storytelling process for Technical and Vocational Preservice Teachers in the Activity of creative media innovations

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บทคัดย่อ

การศึกษากระบวนการเล่าเรื่องแบบดิจิทัลในกิจกรรมการถ่ายทอดผ่านนวัตกรรมสื่อสร้างสรรค์ เพื่อให้นักศึกษาครูช่างอุตสาหกรรมเกิดทักษะการสื่อสารร่วมกับการใช้เทคโนโลยีสารสนเทศที่มีความจำเป็นในศตวรรษที่ 21 โดยมีจุดมุ่งหมาย 1) ศึกษากระบวนการเล่าเรื่องแบบดิจิทัลสำหรับการจัดกิจกรรมการถ่ายทอดของนักศึกษาครูช่างอุตสาหกรรม 2) ออกแบบและพัฒนากิจกรรมผ่านนวัตกรรมสื่อการสอน โดยนักศึกษาครูช่างอุตสาหกรรมเป็นผู้สร้างสรรค์สื่อนวัตกรรมด้วยตนเองเพื่อใช้สนับสนุนการถ่ายทอดของตนเอง โดยการใช้กระบวนการตามขั้นตอนการพัฒนานวัตกรรมสื่อสร้างสรรค์ร่วมกับการวางแผนการเล่าเรื่องประกอบกับการเลือกแพลตฟอร์มสำหรับการนำเสนอในรูปแบบดิจิทัล 3) ศึกษาผลลัพธ์การเรียนรู้จากการประเมินนักศึกษาครูช่างอุตสาหกรรมผ่านกิจกรรมการถ่ายทอดผ่านนวัตกรรมสื่อสร้างสรรค์ โดยประเมินจากผลงานการออกแบบ วางแผน และการแสดงออกหรือพฤติกรรมในการถ่ายทอดของนักศึกษาครูช่างอุตสาหกรรม รวมไปถึงการใช้ทักษะด้านการสื่อสารและการใช้เทคโนโลยีสารสนเทศในการนำเสนอผลงานของนักศึกษาครูช่างอุตสาหกรรมด้วย โดยใช้การประเมินตามสภาพจริงใช้การประเมินแบบรูบริกส์เพื่อดูความสามารถด้านกระบวนการผลงาน การปฏิบัติงาน และประเมินทักษะการสื่อสารและการใช้เทคโนโลยีสารสนเทศประเมินนักศึกษาที่ได้ใช้กระบวนการเล่าเรื่องแบบดิจิทัลผ่านนวัตกรรมสื่อสร้างสรรค์นี้ไปพร้อมกันด้วย โดยเครื่องมือที่ใช้ในการวิจัย ได้แก่ กระบวนการเล่าเรื่องแบบดิจิทัล กิจกรรมการถ่ายทอดผ่านนวัตกรรมสื่อสร้างสรรค์ แบบประเมินการใช้กระบวนการเล่าเรื่องแบบดิจิทัลผ่านกิจกรรมการถ่ายทอดผ่านนวัตกรรมสื่อสร้างสรรค์ของนักศึกษาครูช่างอุตสาหกรรม กลุ่มตัวอย่างในการศึกษาครั้งนี้เป็นนักศึกษาที่เรียนในรายวิชานวัตกรรมและสื่อการเรียนการสอน จำนวน 23 คน โดยการคัดเลือกแบบเจาะจง จากการศึกษาการใช้กระบวนการเล่าเรื่องแบบดิจิทัลของนักศึกษาครูช่างอุตสาหกรรมในกิจกรรมการถ่ายทอดผ่านนวัตกรรมสื่อสร้างสรรค์ พบว่าผู้เรียนสามารถใช้กระบวนการเล่าเรื่องแบบดิจิทัลในการนำเสนอเนื้อหาทางไฟฟ้าและอิเล็กทรอนิกส์ประกอบกับสามารถพัฒนานวัตกรรมสื่อสร้างสรรค์ขึ้นได้ด้วยตนเองได้อย่างมีประสิทธิภาพ โดยได้ผลการประเมินคุณภาพจากการปฏิบัติงานในทุกด้านอยู่ในระดับดีถึงดีมาก

คำสำคัญ : การเล่าเรื่องแบบดิจิทัล, นวัตกรรมสื่อสร้างสรรค์, นักศึกษาครูช่างอุตสาหกรรม

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Abstract

A study of the digital storytelling process in the activity of creative media innovations for technical and vocational preservice teachers to develop communication skills along with the innovative, creative media usage necessary in the 21st century by achieving objectives including. 1) Study a digital storytelling process to arrange for technical and vocational preservice teachers. 2) Design and develop a digital storytelling process by technical and vocational preservice teachers themselves, along with creating innovative, creative media to support their knowledge transfer. By referring to the process of developing creative media along with the storytelling and platform selection for digital presentation. 3) Study the evaluate learning outcomes based on technical and vocational preservice teachers assessment through a knowledge transfer using innovative creative media. The assessment criteria include design, planning, and technical and vocational preservice teachers performance while transferring the knowledge along with communication skills and innovated creative media usage and presentation of a technical and vocational preservice teachers based on rubrics assessment to evaluate process, quality of work, performance, communication, and information technology usage and evaluate students that have used the digital storytelling process through this innovated creative media. The research tools employed in this study include the digital storytelling process, knowledge transfer activities through innovative, the assessment of the use of digital storytelling processes through creative media innovations by technical education student. The population for this research includes students who have enrolled in the Innovation and Instructional Media courses. The sample group for this research was selected through purposive sampling which consists of 23 students. From a study of the digital storytelling process for technical and vocational preservice teachers in the activity of creative media innovations found that students were able to effectively use digital storytelling to present electric and electronic related content and were able to develop creative media innovations independently. The evaluation results of their performance in all aspects were rated from good to very good.

Keyword : Digital storytelling, Creative media innovations, Technical and vocational preservice teachers

Introduction

In the Innovation and Instructional Media course. There has been a requirement for technical and vocational preservice teachers to present their innovative creative media. The presentation demonstrates the process of their innovative, creative media and teaching practice. Allowing their peers in the class to witness the steps involved in utilizing their creations. However, in many cases, technical and vocational preservice teachers have encountered challenges with their presentations, such as being unprepared, incomplete, failing to explain the content as prepared, lacking connections between demonstrations and concepts, lacking processes and techniques to present their work more attractive, in some cases, the media produced does not achieve the desired impact and could often cause a problem during their presentation and could not clearly explain to peers and teacher. As a result, there has been a need for a change in the presentation format by grouping technical and vocational preservice teachers and prerecording their presentations in advance. Additionally, separate demonstrations of using the created media are captured and added to the presentations for more explanation. This approach has helped highlight areas where technical and vocational preservice teachers might not fully comprehend

storytelling, presentation skills, content sequence, or the ability to convey a clear understanding of the material they are presenting. Furthermore, it has underscored the importance of communication and storytelling (Naritsara & Soranabordin, 2023), which are essential skills in effectively presenting their work or explaining content clearly and engagingly. This research aims to explore the digital storytelling process and apply it as a guideline in organizing knowledge transfer activities in the field of electronics and electronics engineering, particularly in this rapidly evolving digital era where digital technology plays a pivotal role, along with organizing an activity that encourages technical and vocational preservice teachers to improve their design and develop their creative media following the process of developing a creative media. The study also aims to develop both the digital storytelling process and the creative media innovation process for application in teaching activities related to electronics and electronics engineering. The objective is to stimulate creativity in the art of presentation and enhance students' experiences that they can apply not only in teaching others but also in their future careers in various fields. By employing real world assessments and feedback based on rubrics, utilizing a feedback oriented assessment approach to evaluate students' capabilities in the process, the quality of work, practical skills, and their ability to communicate effectively while using information technology in presentation. This evaluation will be conducted simultaneously with applying the digital storytelling process through creative media innovation.

The idea of combining storytelling with digital tools can create digital stories. with specific goals Events that have happened from exploring life in one's own community to searching for life from other angles It can be applied to what is being taught. The story that is about to be transcribed to attract attention by choosing to use media that are appropriate for their age, such as lively pictures. Narration appropriate to learning level Relevant digital narratives can help learners understand abstract concepts more easily. Moreover, these digital lectures reinforce concepts and attract different types of learning (Somabut, 2014). You can also let students create their own digital stories and share them. Teachers can create digital stories to help facilitate classroom discussions. It's a set for new topics. or to help students understand more abstract concepts. These stories can become an important part of lessons in many subject areas. Students can also create their own digital stories. And the benefits they will receive from that story are quite numerous. Through the creation of these stories Students must take ownership of the content they are presenting. They must also analyze and synthesize information. All of this supports high-level thinking. Students can express their opinions through expressing their own thoughts and ideas. When students can participate in the steps to design, create, and present their own digital stories. They will be able to build many literacy skills. These include the following Research skills by finding and analyzing information when recording stories. Writing skills when developing scripts and organizational skills by managing the scope of the project within tight time limits. Learning how to use technology is a skill that can be acquired by learning to use various tools. and presentation skills through presenting stories to the audience Students also gain interviewing skills. interpersonal relations, problem solving, and evaluation through completing digital stories and learning to receive and constructive criticism (Demchenko et al., 2021).

Research Objectives

RO1. Study the digital storytelling process for organizing knowledge transfer activities among students through creative media innovations of technical and vocational preservice teachers

RO2. Develop activities using creative media innovations by technical and vocational preservice teachers themselves and support their knowledge transfer.

RO3. Develop tools to assess the learning outcomes of the technical and vocational preservice teachers who use digital storytelling processes for organizing dissemination activities.

Research Scope

The population for this research includes students from the Faculty of Technical Education, King Mongkut's University of Technology North Bangkok, who have enrolled in the Innovation and Instructional Media courses. The sample group for this research consists of 23 students majoring in Electrical Engineering and Education, Faculty of Technical Education, King Mongkut's University of Technology North Bangkok. These students were selected through purposive sampling.

Independent Variable: In this study, the independent variable is the digital storytelling process employed by technical education students for assessing learning outcomes in knowledge transfer activities through creative media innovations. Dependent Variable: In this study, the dependent variable is the students' learning outcomes as assessed through knowledge transfer activities using creative media innovations.

Research Method

The study of the digital storytelling process for technical and vocational preservice teachers to assess learning outcomes in the activity of creative media innovations is a research and development that divided into three phases according to the research objectives.

Phase 1: The Study of the digital storytelling process for assessing learning outcomes in knowledge transfer activities through creative media innovations to improve communication skills and information technology usage that necessary in the 21st century through a digital storytelling process that is appropriate for transfer knowledge in electronic and electrical engineering.

Phase 2: Development of knowledge transfer activities using creative media innovations processes by technical and vocational preservice teachers themselves.

Phase 3: Develop tools to assess the learning outcomes of the technical and vocational preservice teachers who use digital storytelling processes for organizing dissemination activities. The assessment criteria, including the design, planning, and utilization of innovative media of a technical and vocational preservice teacher following rubrics assessment, evaluate an improvement in terms of processes, work outcomes, and practical skills of a technical and vocational preservice teachers. The study of the digital storytelling process for technical and vocational preservice teachers assessment have been evaluated by three experts from Faculty of technical education and digital technology for education and confirmed that the assessment are suitable for use.

Result

From the study of the digital storytelling process for technical and vocational preservice teachers to assess learning outcomes (Adhi et al., 2022) in the activity of creative media innovations in Phase 1 that focused on developing a communication skill along with the technology usage necessary in 21st century involving storytelling that narrates short stories using digital media (Leelitthum, 2023). such as static images, sound, and video clips, accompanied by narration from the storyteller. The narratives

include emotional components that help engage the audience, using digital materials to convey information effectively (Winarto et al., 2020). Furthermore, improving and blending the storytelling along with digital media to transform and convey to students by pushing and supporting technical and vocational preservice teachers to use various materials to reduce listeners' imagination during the transfer. Based on the study of digital storytelling found that digital storytelling has found widespread application in education due to the popularity of the Internet and students' proficiency in information communication (Wannapiroon, 2016). The fundamental components of digital storytelling include as follows: 1) Vividness of the Story, 2) Providing Experiences, 3) Encouraging Creativity, 4) Relevance of Content, 5) Emphasizing Communication Through Storytelling, and 6) Artistic Presentation. Including digital storytelling (Samantha, 2013; Sarnok et al., 2019) Therefore, the digital storytelling process has been applied in designing and developing activities through innovative teaching media by creating their own innovative media in Phase 2 by providing the engineering topics to technical and vocational preservice teachers to follow the designed process. The digital storytelling process consists of six main steps, as follows: 1) Brainstorming involves searching for and gathering relevant information and ideas to address the chosen topic or theme for the digital story. 2) Planning involves the responsibilities and tasks for creating the digital story that is assigned based on individual strengths and expertise for presentation. 3) Researching that involves diverse sources of information related to the chosen topic and conducting comprehensive research to gather the necessary content. 4) Storyboarding involves organizing collected information and structuring it into a storyboard to provide a visual representation of a presentation. 5) Design and Production that involves the actual creation of the digital story. Technologies and media elements are utilized to produce the story. 6) Presentation and Evaluation that involves presenting the digital story and evaluation based on presentation. From the study of digital storytelling and digital storytelling processes in various contexts, it was taken into account to consider the appropriateness of its use in conveying engineering content. Founded that it is possible to apply (Bamroongcheep & Phosri, 2021) digital storytelling to practical teaching because teaching content in engineering often requires imaginative explanations and high-level demonstrations. This approach can be divided into five main steps, can be seen in Fig. 1 as follows.

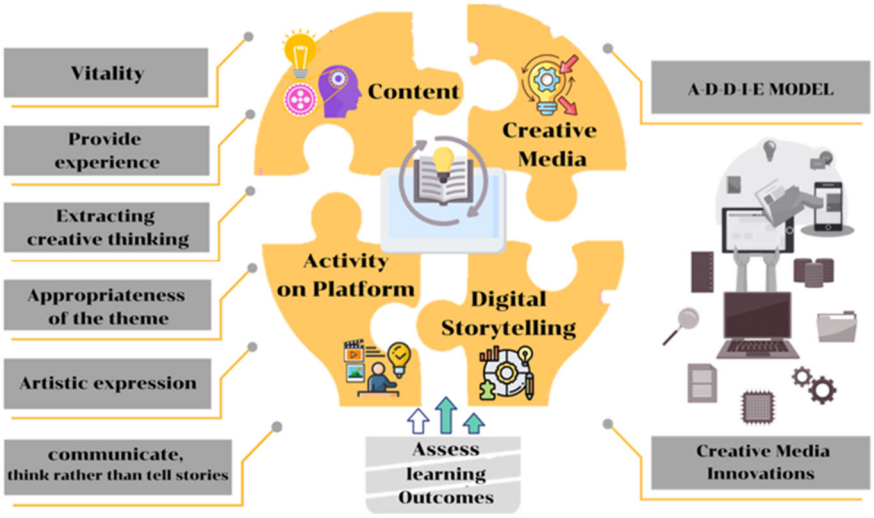

Figure 1 Digital Storytelling Process for technical and vocational preservice teachers

Step 1 Content: This is the starting point of the digital storytelling process for technical and vocational preservice teachers. During this phase, content is prepared by defining its scope, specifying behavioral learning objectives, and determining suitable teaching methods and timeframes. In this content preparation stage, students should meticulously organize the content, consider teaching methods, the results were consistent with the learning outcomes (CLO)

CLO 1: Understand the concepts, theories, media, technology, and innovations for enhancing learning quality.

CLO 2: Design, create, apply, assess, and improve learning innovations.

CLO 3: Select and use information technology media in instructional design.

CLO 4: Apply information technology media effectively in instructional design.

CLO 5: Recognize the importance of innovation in enhancing learning efficiency and inspiring creativity in educational innovation and information technology.

And provide a detailed material breakdown. It should also establish subobjectives to facilitate a clear understanding of how the content will be presented and to provide insights into the details that will be used to create teaching materials effectively.

Figure 2 Example of step 1 Digital Storytelling Process

Step 2 Creative media or Creative Media Innovation: this is the step of an innovative, creative media creation to be used in lesson presentations for practical teaching for technical and vocational preservice teachers that is driven by the creative process and leverages a deep understanding of engineering content to produce various forms of media using technology to make the content more engaging and reduce the need for student imagination. This process follows the A-D-D-I-E MODEL, consisting of five stages including: 1) Analysis (A), 2) Design (D), 3) Development (D), 4) Implementation (I), 5) Evaluation (E).

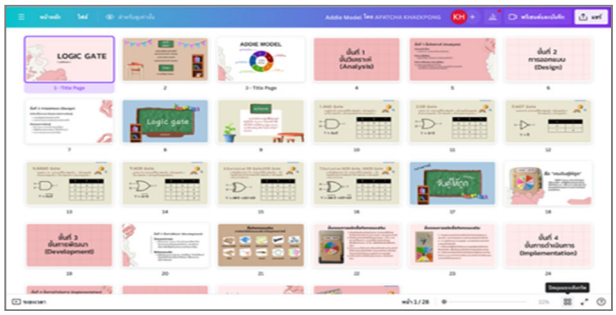

Figure 3 Example of step 2 Digital Storytelling Process

Step 3 Digital Storytelling: This step involves planning the storytelling process, where the instructional content is conveyed based on the direct experiences of the technical and vocational preservice teachers where digital technology is utilized to collect various media elements and transform them into a narrative and encompasses a diverse range of teaching media such as blending actual, simulated, and programmatic elements, through the instructional videos. Furthermore, various elements or other media can be used according to the design prepared for the practical teaching, which means that students, as preservice teachers, are required to design and produce teaching materials following the A-D-D-I-E MODEL following the video production be-fore continuing to the practical teaching.

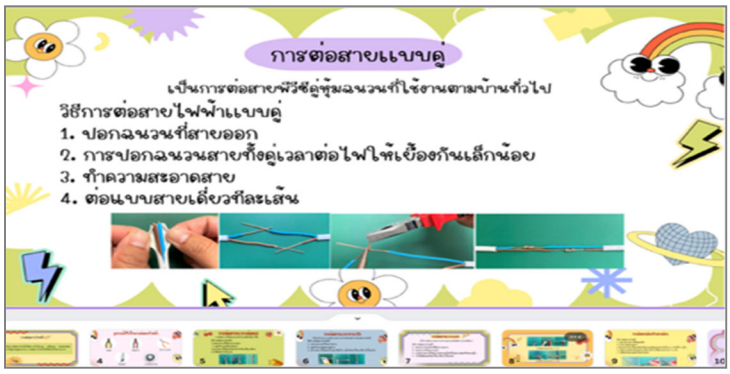

Figure 4 Example of step 3 Digital Storytelling Process

Step 4 Activity on Platform This step is mainly focused on determining the content in the field of electrical and electronics engineering and enabling technical and vocational preservice teachers to practice creating innovative teaching media to support their own instructional content, following the process and step of innovated creative media along with the storytelling planning and digital media usage and platform selection. For conveying knowledge in a digital form and adhering to the principles of digital storytelling that emphasize the importance of artistry in presentation and the communication of understanding beyond mere narration and encouraged to express their comprehension of the content they are conveying through the media they create.

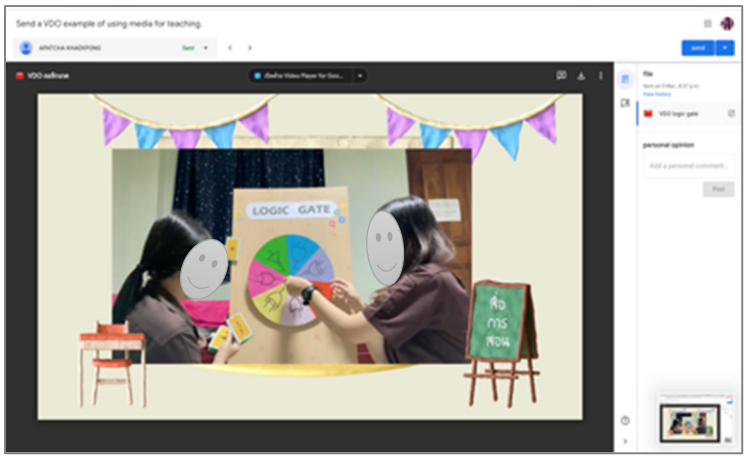

Figure 5 Example of step 4 Digital Storytelling Process

Step 5 Assess learning Outcomes: this step evaluates the learning achievements of technical and vocational preservice teachers who have utilized the innovative teaching media creation activity. This assessment encompasses various aspects, including design, planning, performance, and utilization of materials in content delivery, along with behaviors during the transfer of knowledge. Moreover, evaluation is based on an authentic assessment of the part of communication and the use of information technology in presenting their work in digital formats of a technical and vocational preservice teachers in practical teaching. According to the evaluation based on created work (Yawai & Vongchavalitkul, 2019). The assessment is based on rubrics to evaluate the performance in terms of process, results, and performance (Bupphachart, 2009) by observing performance in each criterion while technical and vocational preservice teachers perform and transfer the knowledge.

Figure 6 Example of step 5 Digital Storytelling Process

From the development of knowledge transfer activities using innovative, creative Media in Phase 2, technical and vocational preservice teachers are designated as creators (Sisamud & Chatwattana, 2023) of innovative teaching media, and the activity involves generating innovative teaching media following the process of developing creative media and digital storytelling. Each group is assigned distinct fundamental electrical and electronic topics to ensure diversity. The designated topics encompass a range of subjects, such as series and parallel circuits, electrical wiring, analog multimeters, electric motors, fluorescent lamps, Rectifier circuits, basic logic, Ohm's law, motor control circuits, types of electrical wires, and resistor value reading. After technical and vocational preservice teachers are informed of their assigned topics, they proceed with the digital storytelling process, which consists of five specified steps, with defined timeframes for each step. These steps are as follows.

Table 1 Digital storytelling process and time frame table

Digital Storytelling Process	**Step 1 Content**	**Step 2 Creative Media Innovation**	**Step 3 Digital Storytelling**	**Step 4 Active on Platform**	**Step 5 Assess learning Outcomes**
Duration of the process	1 week	2 weeks	1 week	1 week	1 week
Progression	15%	40%	30%	15%	Group performance results discussion
Duration of the Digital Storytelling Process	100% 6 weeks total				

During the practical teaching phase of the Digital Storytelling Process for technical and vocational preservice teachers. in addition to reporting their weekly progress in the classroom with their peers, technical and vocational preservice teachers are required to submit a report of their weekly progress in Google Classroom to compile the weekly work of each student along with that of their classmates, fostering an exchange of ideas and experiences among peers. Through this method, students are encouraged to assess both their own and their peers' work, promoting a collaborative learning environment. Each group presents their work in digital media format, typically in the form of instructional videos (where they plan and deliver their own content) and present the learning content based on their innovative, creative media. Furthermore, technical and vocational preservice teachers are required to create websites for disseminating their work, making it accessible to learners and individuals interested in electrical and electronic engineering content.

The study of learning outcomes through the assessment (Sirum et al., 2020) of student's work in the third phase of the Digital Storytelling Process for technical and vocational preservice teachers involves evaluating the design, production planning, and utilization of innovative media by technical and vocational preservice teachers. This assessment is conducted using a rubrics authentic assessment method to evaluate students' progress in terms of processes, outcomes, and practical skills. The results of the assessment are as follows.

Table 2 Evaluation results of the use of the digital storytelling process through activities conveyed through creative media innovated of technical and vocational preservice teachers

Performance evaluation	Quality level from work performance				results
	3 (excellent)	2 (good)	1 (moderate)	0 (poor)	
1) Knowledge transfer design	Appropriate media used and fully matched the. content	Appropriate media used and partially matched the content	inappropriate media used and less matched the content	inappropriate media used and unmatched the content	excellent
2) innovated creative media planning	Design and create a media fully following ADDIE MODEL	Design and create a media over than 3 steps following ADDIE MODEL	Design and create a media less than 2 steps following ADDIE MODEL	No design and create a media following ADDIE MODEL	good
3) the usage of innovated creative media to convey content	Use creativity to present the content through media over 4 types	Use creativity to present the content through media 3-4 types	Use creativity to present the content through media 2 types	Use creativity to present the content through media 1 types	good

Table 2 Evaluation results of the use of the digital storytelling process through activities conveyed through creative media innovated of technical and vocational preservice teachers (continue)

Performance evaluation	Quality level from work performance				results
	3 (excellent)	2 (good)	1 (moderate)	0 (poor)	
4) Storytelling through digital technology	Storytelling based on self-experiences and trigger to think than telling	Storytelling based on self-experiences and trigger to partially think than telling	Storytelling based on self-experiences and trigger to less think than telling	No storytelling based on self-experiences and no trigger to think than telling	good
5) Quality of presentation on the platform	Good looking personality with excellent presentation	Good looking personality with good presentation	moderate looking personality and moderate presentation	poor personality and poor presentation	good
6) Reporting performance results and improvement guidance	Report self-flaw and ready to improve following guidance	Partially report self-flaw and ready to improve following guidance	Less report self-flaw and ready to improve following guidance	Less report self-flaw and refuse to improve following guidance	excellent

According to the evaluation of the technical and vocational preservice teachers's performance following the Process of Digital Storytelling for technical and vocational preservice teachers. It was found that technical and vocational preservice teachers have shown a significant effort in achieving the predefined objectives. Examining student performance and outcomes of a knowledge transfer using innovative, creative media through evaluation criteria that considered their practical activities and the results of their performance in practical teaching. By assessing the use of digital storytelling process for technical and vocational preservice teachers through creative media innovations in six criteria. The assessment utilized rubrics to evaluate the application of digital storytelling techniques in various dimensions, supplemented by interviews and observations. The results of using a digital storytelling process for technical and vocational preservice teachers through creative media innovations could perform well. The average scores for each group were consistently in the "good" to "excellent" range in all 12 groups (each group consisting of 2-3 students in a total of 23), with two criteria that were evaluated at an excellent level including the knowledge transfer design and reporting performance results and improvement guidance. The criteria for passing are from good quality level and above. Each criteria have evaluation quality criteria as follows.

Table 3 Evaluation criteria

Level	Evaluation criteria	Level of quality criteria
3	The performance following Digital Storytelling Process is at an excellent level.	Score range 13-18 Level of quality is excellent.
2	The performance following Digital Storytelling Process is at a good level.	Score range 7-12 Level of quality is good.
1	The performance following Digital Storytelling Process is at a moderate level.	Score range 1-6 Level of quality is moderate.
0	The performance following Digital Storytelling Process is at a poor level.	Score range 0 Level of quality is poor.

Conclusion and Discussion

From the study of the digital storytelling process for assessing learning outcomes in the activity of transferring knowledge through creative media innovations. Aimed at improving communication skills and the necessary information technology in the 21st century (Sodprasert, 2020) through a digital storytelling process suitable for transferring knowledge in electrical and electronic engineering. The appropriate components for technical and vocational preservice teachers include five steps: Step 1: Content, Step 2: Creative Media Innovation, Step 3: Digital Storytelling, Step 4: Activity on Platform, and Step 5: Assessing Learning Outcomes. In the design of the instructional activity, technical and vocational preservice teachers are expected to create innovative media (Panich, 2013) according to the process of developing creative media and digital storytelling. Overall, technical and vocational preservice teachers achieved good results. Based on a digital storytelling process through activities of transferring knowledge using innovative, creative media created by a technical and vocational preservice teachers for a period of six weeks. Technical and vocational preservice teachers in total number of and divided into 12 groups. Each group has received scores in the range of a score between 7-12, which achieves a high-quality criterion. As a result, the study of learning outcomes through the activity of knowledge transferring with innovative, creative media determines the evaluation from the design, production planning and the use of innovative, creative media by technical and vocational preservice teachers following the rubrics assessment in practical teaching to evaluate an improvement in terms of process, results and performance. The scoring rubric served as the tool for self-assessment. This helped the students to develop and revise their case study reports (Ritcharoon, 2019). The results were consistent with the learning outcomes of the course "Innovation and Instructional Media" for students majoring in electrical engineering and education (Bachelor of Engineering in Electrical Engineering and Education, 2018).

In the Study of the digital storytelling process for technical and vocational preservice teachers to assess learning outcomes in the activity of creative media innovations in the era of digital transformation. It has been found that there is a method of organizing the learning experience for students that aligns with the development of knowledge and skills specific to technical and vocational preservice teachers. Additionally, there is an established framework for measuring learning outcomes consistent with the curriculum and the expected learning outcomes of the course. Furthermore, besides aligning with the course specific learning outcomes, the integration of digital storytelling through creative media innovation in the instructional activity introduced in this session has proven to be beneficial in assisting in preparing and familiarizing technical and vocational preservice teachers with digital technology and

fostering their digital competencies. Moreover, this approach serves as a guideline for effective presentation and knowledge transfer in various content areas in the future. It also develops communication skills and the ability to use information technology more effectively and prepare for a digital transformation era where digital technology plays a crucial role. This methodology can be utilized for fostering innovation in various fields and presenting professional work in the future.

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References

Adhi, S., Achmad, D., & Herminarto, S. (2022). Developing a blended learning model in islamic religious education to improve learning outcomes. *International Journal of Information and Education Technology, 12*(2), 100-107. https://doi.org/10.18178/ijiet.2022.12.2.1592

Bachelor of Engineering in Electrical Engineering and Education (New Curriculum 2018). *Department of Teacher Training in Electrical Engineering*, King Mongkut's University of Technology North Bangkok. (2018). [in Thai]

Bamroongcheep, U., & Phosri, P. (2021). The digital storytelling innovation development paradigm for transmission process of gems cutters wisdom towards creative economy of chantaburi province. *Journal of Industrial Education, 15*(1). https://ejournals.swu.ac.th/index.php/jindedu/article/view/13561/11061

Bupphachart, T. (2009). Application of information technology in teaching and learning. Bangkok: Office of Technology for Teaching and Learning Office of the Basic Education Commission. [in Thai]

Demchenko, M. V., Gulieva, M. E., Larina, T. V., & Simaeva, E. P. (2021). Digital Transformation of Legal Education: Problems, Risks and Prospects. *European Journal of Contemporary Education, 10*(2), 297-307. https://doi.org/10.13187/ejced.2021.2.297

Leelitthum, C. (2023). Synthesis of Patterns Digital-media Learning Model Recommended Work for Students to Practice Professional Experience in the Workplace. Journal of Technical and Engineering Education, 14(2), 62–73. Retrieved from https://so10.tci-thaijo.org/index.php/FTE Journal/article/view/755. [in Thai]

Naritsara, P., & Soranabordin, P. (2023). Effects of Digital Storytelling Activities on the Enhancement of English Reading Comprehension Ability of Grade 12 Students. *Journal of Liberal Arts, 19*(1), 7-20. Retrieved from https://rsujournals.rsu.ac.th/index.php/jla/article/view/3046/2491. [in Thai]

Panich, V. (2013). *Creating learning for the 21st century*. Bangkok: S. Charoen Phim. [in Thai]

Ritcharoon, P. (2019). Scoring Rubrics: The Tool for Teachers to Accurately and Fairly Evaluate Learning Outcomes. *STOU Education Journal, 12*(1), 1-6. https://so05.tci-thaijo.org/index.php/edjour_stou/article/view/151008. [in Thai]

Samantha, M. (2013). *8 Steps To Great Digital Storytelling.* Retrieved March 23, 2023, from https://shorturl.asia/wuQif

Sarnok, K., Wannapiroon, P., & Nilsook, P. (2019). Digital learning ecosystem by using digital storytelling for teacher profession students. *International Journal of Information and Education Technology, 9*(1), 21-26. https://doi.org/10.18178/ijiet.2019.9.1.1167

Sisamud, K., & Chatwattana, P. (2023). The Project-based Learning Model using Design Thinking for the Innovators in the 21st Century. *Journal of Technical and Engineering Education, 14*(1), 23–32. Retrieved from https://so10.tci-thaijo.org/index.php/FTEJournal/article/view/348. [in Thai]

Sirum, U., Chaiso, P., Ekwarangkul, P., & Ugsonkid, S. (2020). Strategies of Assessment for Learning for Learners in the 21st century. *Sripatum Review of Humanities and Social Sciences, 20*(1), 193–206. Retrieved from https://so05.tci-thaijo.org/index.php/spurhs/article/view/227304 [in Thai]

Sodprasert, S. (2020). 21st Century Skills : Learning Skills to become the Professional Teacher. *Journal of Multidisciplinary in Humanities and Social Sciences, 2*(1), 1–12. [in Thai]

Somabut, A. (2014). *7 Tips for Creating a 21st Century Learners*. Retrieved March 23, 2023, from https://shorturl.asia/lln8o

Wannapiroon, P. (2016). *Information technology and educational innovation (Teaching documents)*. Textbook production center: King Mongkut's University of Technology North Bangkok. [in Thai]

Winarto, W., Syahid, A., & Saguni, F. (2020). Effectiveness the use of audio visual media in teaching islamic religious education. *International journal of contemporary Islamic education, 2*(1), 81-107. https://doi.org/10.24239/ijcied.Vol2.Iss1.14

Yawai, A., & Vongchavalitkul, N. (2019). Development of Learning Outcomes by Creating a Learning Environment Based on Working in Real Conditions. *Journal of Education Studies, 47*(Suppl.2), 408–428. Retrieved from https://so02.tci-thaijo.org/index.php/EDUCU/article/view/232664. [in Thai]

การอ้างอิงบทความนี้

APA Hinon, K., Seubpradit, L. & Satitpong, P. (2025). A Study of the Digital storytelling process for Technical and Vocational Preservice Teachers in the Activity of creative media innovations. *Journal of Technical and Engineering Education, 16*(1), 30–42. Thaijo. https://doi.org/10.14416/j.ftee.2025.04.03

MLA Hinon, Kanitta, et al. “A Study of the Digital storytelling process for Technical and Vocational Preservice Teachers in the Activity of creative media innovations.” *Journal of Technical and Engineering Education*, vol. 16, no. 1, Apr. 2025, pp. 30–42, https://doi.org/10.14416/j.ftee.2025.04.03. Thaijo.

ISO690 K. Hinon , L. Seubpradit & P. Satitpong “A Study of the Digital storytelling process for Technical and Vocational Preservice Teachers in the Activity of creative media innovations” *Journal of Technical and Engineering Education*, vol. 16, no. 1, pp. 30–42, Apr. 2025, doi: https://doi.org/10.14416/j.ftee.2025.04.03.