Research Article

The effects of integrating digital storytelling with metacognition strategies (DSTMC) learning model to enhance communication abilities

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ARTICLE INFO	ABSTRACT
	Communication skills are soft skills critical for students' development in educational institutions in the digital age. This study aims to determine the feasibility and practicality of a learning model, which combines digital storytelling with a metacognitive strategy called the DSTMC model. This learning model utilized digital storytelling as a primary learning step and integrated metacognitive strategies to monitor the thinking process to improve students' communication, such as listening, speaking, reading, writing, and presentation skills. The research was conducted through case studies at a regional, southern Thailand university. The data were collected from 30 undergraduate participants. The research instruments were expert validation, pre-/post-test data, and a self-assessment questionnaire. The study showed that the DSTMC learning model is an alternative teaching method to improve communication skills, including listening, speaking, reading, and writing. The results of students' test scores and self-assessments provide significant evidence indicating that it increases their learning and retention of information. The paper concludes with suggestions for using various strategies and motivating activities to encourage learners' communication proficiency. Future research should investigate the creation of a system to track how learners improve their communication skills. **Keywords:** digital storytelling, metacognition, communication skill, learning model, active learning

INTRODUCTION

Communication skills are the tools and knowledge essential for citizenship and work in the 21st century. They are defined as one of the 4C skills: critical thinking, creative thinking, communicating, and collaborating, essential to the development of today's learners. Therefore, learners need to be trained in communication to exchange ideas with others constructively and develop their communication abilities, understanding of messages, and conveying and presenting ideas (Bellanca & Brandt, 2010). Communication skills show the ability to organize and convey feelings to others. They can also reflect personal skill levels. Developing communication and presentation skills will be essential in helping learners find jobs quickly and successfully in the future (Holik et al., 2020).

Currently, most Thai students still have problems with communication skills. They need more knowledge and understanding of communication methods and a lack of exciting presentation methods. They often must select appropriate methods to present their ideas, show confidence in communicating opinions appropriately, and clearly and accurately explain the essential points (Kaewnunual & Chalongdet, 2018; Petcharat, 2017). Encouraging students to develop communication skills will enhance logical thinking processes, sequencing ideas, researching decision-making, and presenting ideas. Students will readily connect their concepts with mental imagery and express them to others. Therefore, communication skills are critical and essential for university students, especially in their future careers (Holik et al., 2020). The key to successful employment will be students well trained in communication skills such as writing, speaking, selecting, organizing, and presenting exciting content.

According to research, there are a variety of strategies for developing learners' communication skills, including role-playing, class discussions or debates, video recording, or using technology to practice these skills (Erduran & Jimenez-Aleixandre, 2008; Holik et al., 2020; Marzano & Zorzi, 2020). As a result, teachers play a critical role in encouraging all students to express themselves in various ways, encouraging assertiveness and argumentative opinions based on academic logic. Additionally, the research study found that storytelling is another effective strategy for developing learners' communication skills (Bakar & Jaafar, 2017; Parsazadeh et al., 2021).

In modern times, storytelling is a popular medium and dramatically influences society's perceptions, especially among teenagers (Bechter & Swierczek, 2017; Lambert, 2010; Masuram & Sripada, 2020). Storytelling is essential to developing communication skills as it is the science of conveying ideas or explaining to others the subject they want to communicate accurately. Learners will be self-taught story creators and practice their skills in media production, editing, and conveying meaningful and valuable story content using cognitive processes (James et al., 2019). Creating content can encourage learners to develop language skills, communicate with others, understand the message's meaning, organize content, and use technology in production and dissemination. These skills are all elements for effective communication in 21st-century learning (Papadopoulou & Vlachos, 2014).

Particularly nowadays, how the story is told is more engaging. The capabilities of digital technology are applied to present media compellingly through the digital storytelling process. According to Maddin (2011), digital storytelling is the art of telling a story using a variety of digital multimedia, including text, images, narrative recordings, audio, video, and music, to create a short film about a particular subject. Digital storytelling is an exciting activity for learners who want to improve their communication skills and present ideas through stories. It does so by utilizing storytelling techniques that rely on technology to convey messages through various media.

Digital storytelling is widely used as a teaching method to help students improve their communication skills, most notably their English communication competence (Csikar & Stefaniak, 2018; Elenein, 2019; James et al., 2019; Juvrianto et al., 2018; Kallinikou & Nicolaidou, 2019). Del-Moral-Pérez et al. (2019) researched digital storytelling to assist primary school children in developing their communication abilities. He discovered that DST creation is an educational practice that significantly improves children's expressive and communicative abilities. It relates to developing appropriate environments to acquire story-related competencies and abilities (Niemi et al., 2018). While Sodomora et al. (2021) propose a strategy for improving English communication skills in Ukrainian universities through online student storytelling, it was discovered that DST could engage students in linguistic thinking and thus help them develop their language skills.

However, according to research reviews, digital storytelling is primarily used to improve English communication abilities. There are quite a few studies on improving communication in the native language. Thus, the focus of this study is to ascertain how to improve students' ability to communicate in Thai (their mother tongue) to present exciting stories. We also question the challenges of creating a quality learning environment for learners by learning how to learn, remember, and control their learning using metacognitive strategies effectively. Metacognitive strategies enable students to plan their work, clear goals for work, and learn to improve their abilities in the assigned tasks (Radmehr & Drake, 2020). Why is metacognition required, and is our approach appropriate?

According to Dunlosky et al. (2013), effective learning is associated with learning conditions; materials, methods, strategies, techniques, and criteria assignments, which teachers use to design learning activities to encourage student participation. This is reinforced by Harris's (2019) belief that developing learning plans that identify methods, techniques, and strategies is beneficial for achieving learning objectives. Therefore, teachers must prepare teaching methods that enable students to plan, control and monitor their work, including managing themselves to work to their full potential and be the driving force to be more productive. Therefore, this study is interested in whether the learning process of each level of learners is inserted into checking the thinking process systematically to enhance learning.

Metacognition is usually described as the thinking process of thinking (Lai, 2011) or as a person's cognitive ability to understand their thought processes, their knowledge and thinking, and how to achieve their goals (Flavell, 1979). Metacognition is a strategy that examines the learning process and how students attempt to comprehend concepts through engagement and regulation of their cognition during planning, monitoring, and evaluation (Amraj, 2018). This is in line with Sukarno and El Widdah (2020) findings that metacognition enables students to manage and control their own learning processes and reduce psychological barriers associated with various problems that arise in certain situations.

Additionally, previous research studies found that metacognition is critical to successful learning and a necessary element of the communication process. Puryanto et al. (2021) studied the effect of using metacognition to improve writing skills. It was found that metacognition improved students' adaptability by being more mentally prepared and absorbing information faster. Moreover, students can better understand what they have learned and aims to study to map learning problems better. Meanwhile, Amir et al. (2021) have introduced metacognitive to enhance the adversity quotient in mathematics learning through a think-aloud strategy. This study found that metacognition increased awareness and thought efforts in solving complex problems. Moreover, it is better to tolerate problems and manage discouragement while studying.

The current study, therefore, fills the gap by providing empirical evidence on whether there is a causal relationship between integrating digital storytelling using metacognition strategies in the learning process. Consequently, a review of related research raises an important question: If a mechanism is developed to assist learners in planning and to control the narrative process's workflow, Will this affect our ability to communicate more or less? This study aims to demonstrate whether communication skills can be developed primarily through digital storytelling. However, the proposed learning model included metacognitive strategies to compare learning outcomes and determine whether storytelling in which learners examine and improve their work results in differences in communication abilities. Five related communication abilities were examined from the perspective of a digital storytelling creator: listening, speaking, reading, writing, and presentation (Cigerci & Gultekin, 2017).

The following research questions guided this study:

1. RQ1: What are the steps and elements in a learning process using digital storytelling and metacognitive strategies?
2. RQ2: How can learning process models using digital storytelling and metacognition strategies improve communication skills?

METHODOLOGY

Research Design

This study adopted a quasi-experimental research method using one group pre-/post-test design: $O_1 X O_2$, where O_1 is measurement (pre-test), X is treatment, and O_2 is measurement (post-test).

Participants

The participant of this research was the 30 undergraduate students who enrolled in the storytelling for information professionals' course at Walailak University were asked to participate in the experiment, which was granted ethics approval.

Instruments

The instruments of data collection used in this research were pre-/post-tests and self-assessment questionnaires. As determined by the teacher, a pre-/post-test was used to assess the undergraduate students' communicative abilities through assignment tasks when implementing the DSTMC model. A self-assessment questionnaire was administered to the participants before and after the treatment. Seven experts validated all the instruments with experience in instructional design, communication science, and thinking development. They each have not less than ten years of experience and have published recognized academic papers in a related field. The validity of the instrument was tested using the Content Validity Index. The test results show that all instrument items are declared valid with a CVI value of 0.83. Afterward, expert suggestions were followed to revise further testing and data collection.

Data Collection

This study included the following data gathering techniques:

(1) expert validation, which was utilized to test the validity of the DSTMC model,

(2) as assessed by the teacher, a pre-/post-test was designed to measure the learner's communicative abilities through assignment tasks to evaluate the undergraduate students' performance when implementing the DSTMC model, and

(3) a self-assessment questionnaire was administered to the participants before and following the treatment.

There are several steps involved in this process. At the start, demographic and academic characteristics of the participants were collected. For the pre-test, participants were expected to complete sequentially a listening assignment, a writing assignment, a speaking assignment, a reading assignment, and a presentation assignment without receiving any information on the use of metacognitive storytelling strategies. Participants were given one week to complete each homework assignment at home. After each assignment, they gave given the skills self-evaluation questionnaire. The instructor then assigned grades to each task.

In the following session, the concept of using metacognitive strategies for storytelling was taught (the DSTMC model). Afterward, participants were asked to do sequentially post-tests consisting of a listening assignment, a writing assignment, a speaking assignment, a reading assignment, and a presentation assignment. Participants were given one week to complete each assignment at home. The teacher gave her marks on their assignments. At the end of the experiment, the self-assessment questionnaire was given to them again to probe the potential changes in their views.

Data Analysis

Quantitative data analysis for univariate and multivariate normality was statistically tested to ensure that all variables satisfy the assumption of normal distribution. The skewness and kurtosis statistical tests showed that all values between -2.0 and +2.0 for all variables met the standard distribution criteria. Then, one-way repeated measure multivariate analysis of variance (MANOVA) was conducted using SPSS to find significant differences in the effect of the DSTMC model over time (pre- and post-DSTMC model).

RESULTS AND DISCUSSIONS

The findings of this study were used to answer two questions, as follows:

1. RQ1: What are the steps and elements in a learning process using digital storytelling and metacognitive strategies?

2. RQ2: How can learning process models using digital storytelling and metacognition strategies improve communication skills?

The Development of DSTMC Model

At this stage, the DSTMC model is studied through a literature review to determine which steps of the learning model will be used. From literature reviews related to the digital storytelling process (Kaeophanuek

Figure 1. Digital storytelling combined with metacognition strategies (DSTMC) (Source: Authors' own elaboration)

Table 1. The validation result of learning model and the instructional materials

Validation aspect	Average	Category
Digital storytelling process	4.86	Valid
Metacognition strategies	4.29	Valid
Lesson plan	4.14	Valid
Assignments	4.29	Valid
Assessments	4.14	Valid
Learning model overall	4.43	Valid

et al., 2019; Papadopoulou & Vlachos, 2014; Smeda et al., 2014; Yang & Wu, 2012), it can be concluded that the process of digital storytelling comprises ten steps:

(1) create story ideas,

(2) outline your story idea,

(3) research/explore,

(4) write a script,

(5) create a storyboard,

(6) collect media materials,

(7) production,

(8) revision,

(9) assessment, and

(10) sharing your story.

Following that, we incorporate metacognitive strategies into learning activities to encourage students to plan and assess their thoughts systematically. These strategies include questioning, note-taking, self-reflection, reviewing, rescheduling, and rubric-based assessment, as shown in **Figure 1**.

The DSTMC learning model was validated by seven expert judgments. The expert judgment considered the following factors: the feasibility of the learning process, assignments, learning tasks, and assessment. The validation of the learning model can be seen in **Table 1**.

According to **Table 1**, the expert validation results for the learning model indicate that the digital storytelling process is well-suited for use as the primary step in executing the highest-scoring learning activity (4.86/5.00). However, the two experts agreed that the educational process should be enhanced. It was suggested that the model be simplified and that the steps be given more descriptive names. The researcher

Table 2. One-way repeated MANOVA (multivariate analysis of variance) results of communication skills assessment before and after using DSTMC model

	Pillai's trace	F	df	Error df	p
Time	0.97	168.06	5	25	<.001*

Note. *$p<.05$

Table 3. Descriptive analysis results of participants' listening, speaking, reading, writing, & presentation skills

Communication skills	Pre-/post-	n	Mean	Minimum	Maximum	Standard deviation
Listening skill	Pre-test	30	7.63	6.00	9.00	0.75
	Post-test	30	8.74	7.75	10.00	0.64
Speaking skill	Pre-test	30	14.47	12.50	17.00	1.41
	Post-test	30	17.33	15.25	19.50	1.07
Reading skill	Pre-test	30	10.74	9.00	11.83	0.75
	Post-test	30	13.21	12.00	14.75	0.90
Writing skill	Pre-test	30	13.90	11.00	15.50	1.30
	Post-test	30	17.18	14.00	19.25	1.30
Presentation skill	Pre-test	30	13.85	11.00	17.00	1.34
	Post-test	30	17.18	15.00	19.75	1.17

incorporated the recommendations to continue revising and improving the model. The revision was carried out with the assistance of experts.

Following that, the expert validation results for metacognition strategies and assignments were ranked (4.29/5.00). The researchers defined metacognition strategies through a systematic review of the literature (Amraj, 2018; Diaz, 2015; Lan, 2019; Murphy, 2009; Puryantoa, 2021) to define appropriate planning, monitoring, and evaluation methods during storytelling processes.

The DSTMC Model Effectiveness

To study the feasibility and application of the DSTMC model and how it affects the development of communication skills. We report the results of the research divided into two parts, as follows.

Communication skills assessment before and after using DSTMC model

By requiring learners to complete assignments at each stage of the digital storytelling process, we were able to evaluate the DSTMC model's performance. The final product is video clips of digital stories from all learners. To determine the efficacy of the DSTMC model in terms of its effect on the development of communicative abilities, we compared pre-/post-test scores on teacher-assigned tasks. The first is to report Socio-demographic and academic characteristics. A total of 30 participates completed the experiment of which 19 were male (63%) and 11 were female (34%). On average they were 19 years old (*M*=19.26, *SD*=2.62). Academic performance, measured by GPAX, varied between 1.80 and 3.82. Seventy-seven participants (77%) had a GPA more than 2.50.

The effect of the DSTMC model on participants' listening skills, speaking skills, reading skills, writing skills, and presentation skills was compared using a multivariate repeated measures analysis. The multivariate analysis comparing pre-and post-test measures of each skill revealed statistical significance, Pillai's trace=0.97, $F(5, 25)=168.06$, $p<.001$), as shown in **Table 2**. The means, maximum score, minimum score, and standard deviations are presented in **Table 3**.

As shown in **Table 3**, five communication abilities were evaluated by comparing statistically significant differences in pre- and post-test scores. Teachers assigned a variety of activities to assess students' communication abilities following the incorporation of metacognitive strategies into the learning process. Univariate tests were then conducted on the measures of participants' listening skill, speaking skill, reading skill, writing skill, and presentation skill separately. The average post-test listening score was significantly higher than the pre-test average ($F(1, 29)=126.32$, $p<.001$), as was the average post-test speaking score ($F(1, 29)=201.55$, $p<.001$), as was the average post-test reading score ($F(1, 29)=340.35$, $p<.001$), as was the average post-test writing score ($F(1, 29)=374.47$, $p<.001$), and as was the average post-test presentation score ($F(1, 29)=415.69$, $p<.001$), as shown in **Table 4**.

Table 4. Univariate tests: Results of communication skills assessment before and after using DSTMC model

	Type III sum of squares	df	Mean square	F	p
Listening	18.43	1	18.43	126.32	<.001*
Error	4.23	29	.15		
Speaking	122.55	1	122.55	201.55	<.001*
Error	17.63	29	.60		
Reading	91.51	1	91.51	340.35	<.001*
Error	7.78	29	.27		
Writing	160.88	1	160.88	374.47	<.001*
Error	12.46	29	.43		
Presenting	165.74	1	165.74	415.69	<.001*
Error	11.56	29	.40		

Note. *p<.05
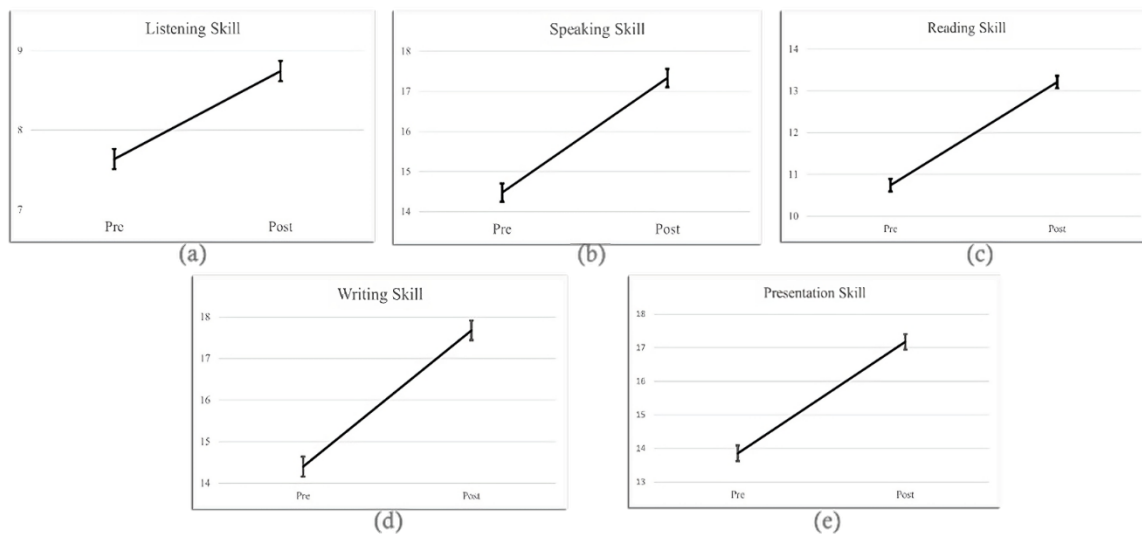
Figure 2. Profile graphs of the pre- & post-test scores of participants' listening, speaking, reading, writing, & presenting skill scores, respectively (error bar, ±standard error) (Created by authors based on the research data)

The profile graph shows the changes in participants' listening skill score, speaking skill score, reading skill score, writing skill score, and presentation skill score are presented in of **Figure 2**.

In **Figure 3**, it is presented the percentage change in students' communication skills in each aspect when metacognitive strategies are added to learning activities. When compared to other skills, it was discovered that writing skills improved the most (32.75 %). It occurred because teachers assigned students to practice writing exciting stories from scripts and storyboards. The metacognition strategy enables students to review their story writing by asking questions about who, what, when, where, why, and how, known as the 5W1H technique. Students must revise their writing in accordance with the teacher-defined rubric criteria, which include easily understandable content organization. Complete storytelling requires double-checking the spelling and source of the content before submitting it to the teacher for grading.

This is consistent with the research of Csikar and Stefaniak (2018) showed that storytelling is an excellent method for bridging the gap between facts and students' comprehension of learning. Students can explain concepts through narrative techniques.

Moreover, students need to take notes to plan their work, set goals, create a timeline, and record what they have learned from observation, reading, and listening to present the story to make it enjoyable. This statement is in accordance with the statement of Colognesia et al. (2020) showed that metacognitive questions were introduced before, during, and after writing, allowing students to improve their writing and enabling them to reuse that learning in writing the final version effectively. This links with the results of Boylea et al. (2016) indicated the importance of note-taking as a metacognitive strategy for students with learning
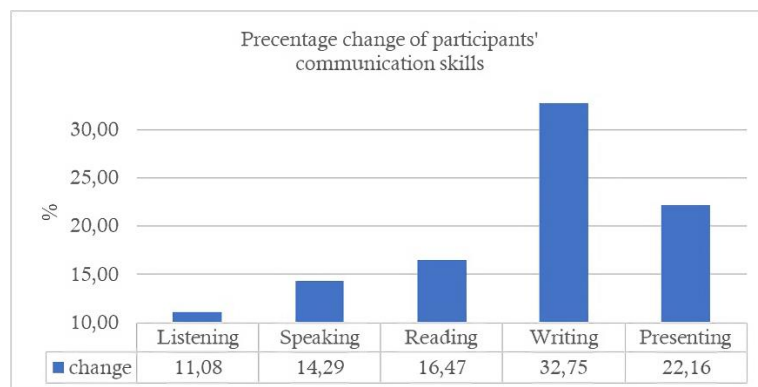
Figure 3. Percentage change of participants' communication skills (Created by authors based on the research data)

Table 5. One-way repeated MANOVA (multivariate analysis of variance) results of participants' perceptions of their communication skills before and after using DSTMC model

	Pillai's trace	F	df	Error df	P
Time	0.98	265.64	5	25	<.001*

Note. *p<.05

disabilities. Students were discovered to use their advantage to plan their work and to highlight the lecture's most essential points.

Additionally, the researcher inserted a metacognitive strategy consisting of rescheduling worksheets, reviewing, and self-reflection through a google sheet to enable students to continuously review their thinking processes in all phases of work. This strategy allows learners to examine their thoughts on what they are doing and what other tasks to do, check progress, troubleshoot issues, and adjust strategies to complete tasks on time and efficiently. Previous and current research (Boud, 2001; Dewey, 1933; Negretti, 2012; Redwine et al., 2017) emphasizes the importance of student reflection to learn and continuously evaluate tasks and performance. Students' metacognitive awareness during self-reflections aided them in transferring their new understandings, identifying areas of incompetence, and adjusting their strategies as needed to complete the following assignment, correlating with Gibson et al. (2016) asserted that reflective writing embedded in metacognitive activities are critical for students to receive constructive feedback that sheds light on how to work effectively. This links with the results of Farahian and Avarzamani (2018) indicated that self-reflection is a method for learners' metacognitive activities and can also be used to assess writing abilities. While the teacher assessed the learning outcomes from the listening activities, there was no difference in learning outcomes before and after applying the metacognitive strategy (11.08%).

Participants' perceptions of their communication skills before and after using DSTMC model

After completing the learning model's activities, the researcher asked students to self-reflect on their progress in five areas of communication skills before and after learning the DSTMC model. To evaluate the differences in the mean scores of participants' perceptions of their communication skills, including the subscales of participants' perceptions of their listening skill, speaking skill, reading skill, writing skill, and presenting skills, a one-way repeated measure MANOVA was conducted to assess whether there were differences among these five subscales over the period (pre-test, before the implementation of DSTMC; post-test, at the end of the implementation) as the five subscales were significantly correlated. The results of MANOVA indicated a significant difference for these five subscales over time, Pillai's trace=0.98, F(5, 25)=265.64, p<.001, as shown in **Table 5**.

The means, maximum score, minimum score, and standard deviations are presented in **Table 6**. From **Table 6**, univariate tests were then conducted on the participants' perception of their listening, speaking, reading, writing, and presentation skills separately. The average post-test score of participants' perception of their listening skills was significantly higher than the pre-test average (F[1, 29]=261.00, p<.001), as was the average post-test score of participants' perceptions of their speaking skill (F[1,29]=250.64, p<.001),), as was

Table 6. Descriptive analysis results of participants' perceptions of their listening, speaking, reading, writing, & presentation skills

Skills	Pre-/post-	n	Mean	Minimum	Maximum	Standard deviation
Listening skill	Pre-test	30	2.60	3.00	2.00	0.50
	Post-test	30	4.10	5.00	3.00	0.40
Speaking skill	Pre-test	30	2.53	3.00	2.00	0.51
	Post-test	30	4.00	5.00	3.00	0.37
Reading skill	Pre-test	30	2.47	3.00	1.00	0.57
	Post-test	30	3.53	5.00	3.00	0.57
Writing skill	Pre-test	30	2.23	3.00	2.00	0.43
	Post-test	30	3.73	5.00	3.00	0.52
Presentation skill	Pre-test	30	2.80	3.00	2.00	0.41
	Post-test	30	4.07	5.00	3.00	0.58

Table 7. Univariate tests: Results of participants' perceptions of their communication skills before & after using DSTMC model

	Type III sum of squares	df	Mean square	F	p
Listening	33.75	1	33.75	261.00	<.001*
Error	3.75	29	.13		
Speaking	32.27	1	32.27	250.64	<.001*
Error	3.73	29	.13		
Reading	17.07	1	17.07	83.42	<.001*
Error	5.93	29	.21		
Writing	33.75	1	33.75	261.00	<.001*
Error	3.75	29	.13		
Presenting	24.07	1	24.07	237.93	<.001*
Error	2.93	29	.10		

Note. *$p<.05$

the average post-test score of participants' perceptions of their reading skill ($F[1,29]=83.42$, $p<.001$), as was the average post-test score of participants' perceptions of their writing skill ($F[1,29]=261.00$, $p<.001$), and as was the average post-test score students' perception of their presentation skill ($F[1,29]=237.93$, $p<.001$), as shown in **Table 7**.

The average score for each skill in participants' perceptions of their communication abilities indicates that the average post-test score is significantly higher than the pre-test score, as illustrated in **Figure 4**.

Figure 5 illustrates the percentage change in participants' perceptions of their communication abilities for each skill. The average post-test score is greater than the pre-test score. Students' positive responses to learning were derived from self-assessment questionnaires distributed using the DSTMC model after the process. Considering each aspect, learners assessed their listening and writing skills at a higher level (30%). Thus, it can be stated that students assessed their abilities through additional learning task activities that increased their learning efficiency.

Figure 4. Profile graphs of the pre- & post-test scores of participants' evaluation their listening, speaking, reading, writing, & presenting skill scores, respectively (error bar, ±standard error) (Created by authors based on the research data)
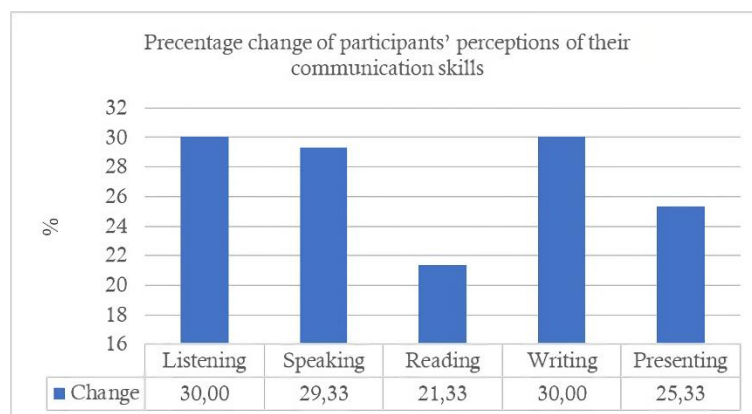

Figure 5. Percentage change of participants' perception of their communication skills (Created by authors based on the research data)

The assessment of writing ability was in line with the teacher evaluating the test at the highest level. We incorporated 5W1H questioning techniques to provide learners with a framework for narrative writing, thereby increasing their sense of purpose in their writing. This statement is based on Chou (2012) findings that writing a summary facilitates learners' metacognitive thinking and that 5W1H is a frequently used approach to developing written skills.

Surprisingly, students' listening skills assessed their abilities differed from the scores assessed by teachers. The students are self-assessed that they had developed more skills in this area than before (30%). We have inserted a metacognition strategy called the taking notes technique to help students grasp the point and practice listening more meaningfully. The instructor assigned listening exercises using taking notes, where students take notes before the interview, including planning techniques, interview questions, tasks to do, and preparation, as a tool to help students prioritize their thoughts and allow learners to plan their work. In addition, the activities used to practice listening skills were related to the sounds and music used in digital storytelling. The goal of the activity is for learners to select music for the narrative that accurately conveys the story's mood. The results provide some empirical support for the idea that visual, and audio supports assist learners in stimulating memory, motivating them to learn, and having an adequate amount of available working memory capacity to comprehend the information (Bozorgian & Alamdari, 2017). Metacognition is inextricably linked to other factors that predict students' achievement, such as motivation, self-efficacy, and

goal setting (Coymak, 2019; Fauzi & Sa'diyah, 2019). As a result, when learners assume that their metacognitive strategies can assist them in resolving their problems and achieving success, they are satisfied with their abilities and evaluate their performance accordingly.

Although the findings of this study demonstrate that metacognitive strategies positively affect students' listening ability as assessed by the students themselves. One possibility is a short time to assess the ability to develop listening skills. Therefore, familiarizing students with these strategies and being able to master these strategies takes longer. Students will likely require continuous training for an extended period (Muhid et al., 2020).

The research also revealed that students perceived their reading skills (21.33%) to have improved less than other skills. However, related research studies have shown that metacognition improves reading skills (Becirovic et al., 2017; Keskin, 2013; Ozturk & Aydogmus, 2021). Metacognitive reading strategies include skimming, evaluating reading, reviewing, and summarizing, which are essential in promoting the learner's reading ability. To ascertain the difficulty of a text, students must integrate prior knowledge and newly acquired information and identify the text's central ideas because the digital narrative process emphasizes narrative communication from the perspective and experience of the individual rather than documentary presentation. As a result, activities that emphasize reading comprehension, reading summaries, selecting appropriate information sources, and the metacognition strategies included in this model, may not help students improve their reading skills. Although, based on the description in the paragraph above would be proved by Wardah (2014) indicated that students' reading skills would improve as they practice locating the main ideas, explicit and implicit information, references, and interpreting comprehension ability of a text.

CONCLUSIONS AND RECOMMENDATIONS

Based on the data and analysis, it can be concluded that teachers and students agreed that writing skills were the most developed communication skills in the five areas. Therefore, this research concludes that the chosen metacognitive strategies, such as questioning, note-taking, self-reflection, reviewing, rescheduling, and assessing rubrics, enhance students' communicative ability through digital storytelling. According to the research results, reading skills were the least developed skills. Therefore, the researcher recommended increasing reading proficiency using various strategies and motivating activities to encourage learners to improve their reading comprehension. In addition, critical reading encourages students to make connections between their current and new information and summarize the text's essential concept. In addition, using other metacognitive strategies to monitor activities, regulate results, and coordinate cognitive processes, remain essential to continuous learning. This will positively affect the enhancement of students' metacognitive abilities.

The findings of this study indicate that the teacher can tailor the metacognitive strategies used by the learner to achieve the desired learning outcomes. Because when a student has mastered metacognitive strategies, their metacognitive abilities tend to be more developed. Metacognitive strategies have taught them to control what they need to learn, what problems are encountered during learning, and how to solve them, and learning methods are more focused on problem-solving. This DSTMC model incorporates reviewing and rescheduling to monitor the work process effectively. At the same time, rubrics serve as a guide for ensuring that all steps are completed correctly and effectively, assessing the final product of storytelling. The implications for adopting this DSTMC model are regarded as the most effective tool for visualizing the critical phases, elements, and instructional strategies for teaching and developing communication skills.

Future research should continue to develop a system to monitor how learners improve communication skills. Another area of future research is to find a method or approach within the learning model to measure the level of the development of metacognition skills of learners with different learning styles. It was realized that as a result of the research, metacognitive skills increased the students' academic success. Therefore, it is necessary to add metacognition in the learning process and teaching stages to promote learners' essential skills in the 21st century.

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