Supporting Creativity Learning in Digital Storytelling with Tablet Computers: A Peer Assessment Approach

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Abstract: Peer assessment (PA) has been widely adopted in an educational context with ample evidence suggesting the potential to promote learning. We argue that although the process of asking learners to involve in assessing achievement of the others might be a beneficial manipulation for learning, the effectiveness is still unclear for young pupils when creative learning tasks such as storytelling are involved. Creativity self-efficacy might be interfered with peers' feedbacks. Thus, the presented study proposes an approach to support creativity learning through peer assessment aided by Tablet computers. This study sought a deeper understanding of the relationship between creative self-efficacy (CSE) and creativity product among 54 sixth graders on completing a digital storytelling project. Findings and discussions are included.

Key terms: Creative self-efficacy, Peer-assessment, Digital storytelling

1. Introduction

"Who does what to whom…" We tell stories in our entire lives for that it is one of the most familiar patterns to make sense of our surrounding world [5]. The process of telling a story requires reasoning and elaborating where the minds immerse in the scenario, interchange ideas with personal and cultural values [9], while negotiating and renegotiating meanings within experiences [3]. Therefore, educators and researchers consider storytelling as an important pathway to fulfilling instructional objectives. However, scholars did not recognize storytelling with its educational potential until later where constructivists started to approach instructional design with learner-centered instruction, situated learning, learning styles, and so forth [5]. Thus, investigations on practicing the ability to generate and tell stories should be seen as rehearsals of skills to effective learning. Robin [10] defined digital storytelling as a combination of multimedia with "computer-based graphics, recorded audio, computer-generated text, video clips, and music" that allows users to "become creative storytellers through the traditional process of selecting a topic, conducting some research, writing a script, and developing an interesting story" (p. 222). However, most of children seem to lack of the opportunity to learn how to create and tell stories. To tell stories digitally, storytellers need to understand the fundamental knowledge and evaluate what are good stories based on the knowledge. However, recent studies of creativity indicated that teaching students to learn fundamental knowledge may limit the levels of creativity self-efficacy. Thus, there is a need for a pedagogical approach to enhance students' knowledge about stories and self-efficacy for the creative activity.

Peer assessment may be a potential approach to address the above issue as literatures suggested that the practice of assessing one another's work can help form the ability of

recognizing key performance that is associated to high quality work [12; 16]. Peer assessment has complicated influence on creativity learning as learners' cognitive, affective, and self-efficacy status may have interfered with the entire learning process [7; 14]. On one hand, by evaluating others' storytelling works, one may know the fundamental knowledge about high quality stories. On the other hand, previous studies might have underpinned the complexity of the forming and the effect of peer assessment [13]. Strijbos, Narciss, & Dünnebier [11] pointed out peer assessment from the more able peers may led to a negative effect, and it might negatively influence their creative tasks [13]. This study thus aims to develop a pedagogical approach with peer assessment enabled by Tablet computers. It is hoped that through the aid of Tablet computers and peers assessment, students not only can develop fundamental knowledge about storytelling but also sustain their self-efficacy toward the creative activity.

2. Method

2.1 iPad Storytelling Application

Portable and easy to share make a Tablet computer distinguishable from a desktop computer, so as to enable the progress of peer assessment and interaction among peers. Thus to support creativity learning in the storytelling, this study developed an iPad application. The system allows the storyteller to draw (e.g., using pencil, color picker, eraser, cleaner, and stamp), to tell (e.g., using voice recorder and background music), and to frame (e.g., using new frame), in order to produce a digital storytelling project (see Figure 1)

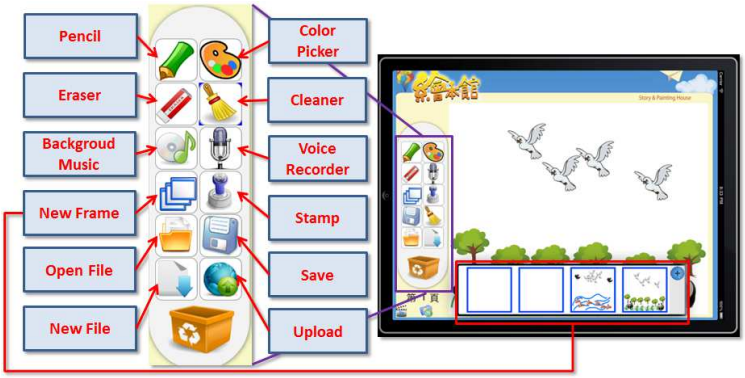

Figure 1. Interface of the iPad storytelling application.

2.2 Creativity Self-efficacy (CSE) Questionnaire

In order to better understand how peer assessment influence one's creative self-efficacy, this study adopted a CSE questionnaire that was originally developed by Hung [4] examining CSE with three dimensions: (1) self-efficacy on creative performance (CSE-performance), (2) self-efficacy on creative strategy (CSE-strategy), and (3) self-efficacy on the attitude toward significant negative feedbacks from others (CSE-Nfeedback). Additionally, the summation of these three factors represents an overall level of CSE. Cronbach's Alpha reported internal consistencies of the CSE questionnaire on the overall CSE (.825), CSE-strategy (.78), CSE-performance (.64), and CSE-Nfeedback (.74), indicating a moderate level reliability.

2.3 Peer Assessment (PA) Form

The current study aimed at a peer assessment process that would facilitate learning of creativity in the context of storytelling. Based on a previous study [6], we proposed a 5-items-criteria that focuses story grammar, which consisted: (1) general settings, (2) storyline, (3) creativity, (4) technical performance, and (5) overall presentation of the story. Such PA was designed for testing our assumption that applying PA could promote students' creativity performance.

2.4 Grading Rubrics and Process of Storytelling Product

Since the Draw&Tell application turns stories as slow motion frames (i.e., slideshows), the current study adopted a widely used checklist for movie production as the grading rubrics [15]. The rubrics examine the final production within nine emphases: (1) transitions & edits – 2 items, (2) planning & storyboarding – 4 items, (3) action & dialog – 2 items, (4) accuracy of information – 2 items, (5) originality & creativity – 2 items, (6) sound usage – 2 items, (7) drawing – 2 items, (8) camera picturing – 2 items, and (9) framing – 2 items. Grades were calculated per item from five (i.e., the highest points) to one (i.e., the lowest points). The grades from these nine categories with total 20 items were calculated together to indicate an overall performance. Additionally, we would look more closely at one emphasis of originality & creativity than the others. Two raters used this rubric to grade all of the 54 final products. The results were tested by correlational analyses and the result yielded to a range between .539 and .848 ($p < .01$) which indicated the grading process is highly reliable.

2.5 Participants & Procedures

Two classes consisted with 54 sixth graders from an elementary school in northern Taiwan were randomly selected to participate in the current study.

Eight consecutive classes with one hour weekly meeting were scheduled. At the 1st class, the pre-CSE was administered, and orientation for storytelling and the iPad Draw&Tell application. Students were then had the opportunity to practice a story for the 1st and 2nd week. From the 3rd to the 8th week, students were assigned a new topic, "Saving the ecological environment", as the formal project. The experimental group started to review their peers' works during the 6th and 7th weeks. Rather than grading on them, they review works with a PA handout. Students then submitted the handouts to the instructor without further process regarding PA. As a comparison, the controlled pupils did not know and process the peer assessment. After the eighth weeks, all students were asked to fill the post CSE questionnaire at home in the 9th week. In the 10th and 11th weeks, 12 pupils from both the groups were randomly selected to be interviewed. These data were treated rather as anecdotal data than qualitative data. Finally, the entire treatment was completed.

3. Results

T-test did not report any difference on the overall creative self-efficacy (CSE), CSE-strategy, CSE-performance, and CSE-Nfeedback between the 2 classes' pre-CSE questionnaire, suggesting an equality of homogeneity on the 2 groups' pre-CSEs.

In regards to the post-CSEs, T-test reported some significances between the 2 classes' post-CSE: overall CSE, $t(52) = 2.163$, $p = .035$; CSE-strategy, $t(52) = 2.230$, $p = .030$.

In regards to creative performance, T-test reported some significance on final scores of students' creative products between the two groups: overall score, $t(52) = 2.591$, $p = .012$; transitions & edits, $t(52) = 3.769$, $p < .001$; planning & storyboarding, $t(52) =$

3.495, p = .001; accuracy of information, t(52) = 3.230, p = .002; drawing, t(52) = 2.620, p = .012. Selected significant items are listed in Table 1 with descriptive statistics.

Table 1. CSE and Final scores

Group	N	Creative Self-Efficacy	Mean	S.D.	Selected Final Scores	Mean	S.D.
PA	28	Performance	3.36	.70	Originality & Creativity	2.87	1.09
		Strategy*	3.76	.61	Transitions & Edits*	3.60	.89
		Nfeedback	3.87	1.02	Planning & Storyboarding*	3.20	.94
		Overall*	3.64	.49	Accuracy of information*	3.35	1.12
					Overall*	2.98	.90
NonPA	26	Performance	3.10	.68	Originality & Creativity	2.36	.93
		Strategy*	3.43	.44	Transitions & Edits*	2.77	.71
		Nfeedback	3.65	.66	Planning & Storyboarding*	2.39	.74
		Overall*	3.37	.43	Accuracy of information*	2.42	.98
					Overall*	2.39	.74

Note. * indicates significant difference between the 2 groups

4. Discussion

Hypothesis 1. Peer assessment has a positive effect on performance of digital storytelling utilizing Draw&Tell Tablet computer application among elementary schoolers. – *PA has a positive effect on participants' overall score.* Hypothesis 1 was retained as the result indicated that PA had a positive on participants' final score. Such finding is consistent with the existing literature that PA promotes peer learning [12]. Furthermore, the finding supported our assumption that a simplified PA could eliminate a potential negative effect on creativity outcomes and promote creative outcomes. Bandura [1] suggested that instead of applying traditional types of PA (e.g., grading, commenting, feedbacks, etc.), a PA process to be more informing and less evaluating-orientated might produce a positive effect on creative outcome.

Hypothesis 2. Peer assessment has a positive effect on creative self-efficacy (CSE) of digital storytelling utilizing Draw&Tell Tablet computer application among elementary schoolers. – *PA has a positive effect on participants' levels of CSE.* Hypothesis 2 was retained as the result indicated that PA had a positive effect on participants' levels of CSE. Literature suggested a raise on the level of CSE might indicate a higher quality of creative outcome [8], as well as the potential on the academic success [2]. The finding echoes that a personal belief on creativity could be enhanced by training (i.e., PA could be seen as a reinforcement of informing personal belief on creativity) [8].

In order for a better understanding of participants' thoughts behind the data, we randomly interviewed 12 students from both the groups as anecdotal data. Unlike in the experimental group where students had the opportunity to learn from their peers, students in the controlled group mostly revealed that "*I don't feel my work is special*", or, "*I feel others might have done better than me.*" When we took one more step by asking "*Better on? Or worse on what?*" Students could not specify what they mean about the differences. This echoed our finding that a peer assessment process was helpful for students to be appreciative of ones' own works, and thus then increase the level of personal belief on creative performance (i.e., CSE). We heard similar reflections when asking what they would have felt if negative feedbacks were given. Most students from both groups revealed that they would not give up their ideas. This might explain a PA did not constrain self-efficacy on creativity, and why students' final score correlated positively with CSE-Nfeedback. It was conjectured that students who possessed a higher level of creative self-efficacy on dealing with significant feedbacks, there was a potential that they could perform a higher quality of the task.

5. Conclusion

The current study investigated a peer assessment effect on students' creative work (i.e., storytelling) and creative self-efficacy in a creativity learning context. The findings suggest implementations in elementary education that peer assessment may promote students' creativity performance and creative self-efficacy. Additionally, the current study re-tested the assumption that creative self-efficacy could be enhanced by reinforcing the beliefs about creative performance. The reinforcement was carried with a peer assessment process in the presented study. As a result, students performed better quality of their creativity works as well as reflected a higher level of creative self-efficacy. Such findings may inform an implementation for educational settings.

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