

## **THE IMPACT OF ONLINE RECIPROCAL PEER TUTORING ON STUDENTS' ACADEMIC PERFORMANCE**

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### **Abstract**

Students learn and teach each other is believed able to optimize their learning outcome. Today, with the rapidly emergent online technology has provided the students' opportunity to gain knowledge without relying solely on teachers. By implementing a peer learning like reciprocal peer tutoring strategy, incorporating with the popular and trendy online platform such as Facebook can be used to improve educational outcomes. In this study, the reciprocal peer tutoring strategies have been implemented using Facebook as a platform for students to learn and discuss the subject matter. This study investigates the effectiveness of online reciprocal peer tutoring in improving their academic performance. A pre-experimental (Pre- and post-test) was conducted across 4 weeks, involving 29 undergraduate students. The result suggests the online reciprocal peer tutoring environment was found to significantly influence the students' performance test. Thus, the online reciprocal peer tutoring can be promising in higher education.

Keywords: Academic performance, Achievement, Facebook, Online reciprocal peer tutoring; Peer learning.

## **1. Introduction**

Peer tutoring involved student acting as surrogate teachers whose aim was the transmission of knowledge [1, 2]. Undoubtedly, some learners prefer studying with teachers, who are recognized as experts within their fields and are considered professional. In an online discussion environment, some researchers suggest the presence of teachers, which can improve learning and increase participation [3, 4]. However, some students find the presence of teachers in online discussions to be an overbearing influence on them and their ideas [5]. As a result, the presence of a teacher can hinder a student's participation and learning.

Peer tutoring has often been implemented within a classroom environment, and only in the recent past has peer tutoring shifted from the classroom environment to an online collaborative learning environment [6]. With the flexibility of online learning, in terms of space and time, learning is likely to take place outside of classrooms, anytime, anywhere.

Currently, the most popular and leading SNS is Facebook, surpassing other social networks including Twitter, LinkedIn, and Myspace. Many college students have been using Facebook on a daily basis [7]. Santos et al. [8] claimed that Facebook has the potential to complement face-to-face learning or online classroom activities, due to Facebook's multiple features including chat, photos and videos, newsfeeds, groups, and others, which enable students to easily interact and share their thoughts with their peers. Moreover, a Facebook platform such as Facebook group provides space for students and instructor to discuss academic-related matters.

In addition, learning through Facebook may promote active student interaction through online discussions [9]. Learning through online discussions using the Facebook platform can establish a student-centered environment, for instance, allowing students to construct new knowledge [10, 11] and facilitate higher order and complex cognitive skills [12]. In addition, Facebook has an element of social connectivity and personal profile spaces in which, current students are familiar with compared to a formal platform such as blackboard [13]. Students are also comfortable in discussing using Facebook and may lead to self-disclosure, which affects positively in peer-to-peer interaction [14]. Thus, this element may contribute as a motivation factor to engage more students' to use Facebook for their learning [15].

In this study, the teaching strategies that involve peer learning, such as reciprocal peer tutoring (RPT), are suitable for implementation through Facebook. RPT is a social constructivism learning, which can yield significant gains in regards to academic achievement within targeted curriculum areas [16]. RPT is characterized by switching the role of tutor and tutee at strategic moments during peer learning [16]. RPT is claimed to give mutual benefits to tutor and tutee.

## **2. Literature Review**

Peer tutoring has been commonly mentioned in [17] views that learners gain mastery and develop cognitive skills through interaction with others and their environment. He also believes that the environment where the learners grow up will influence how they think and what they think about. This shows that social interactions between community and learner beneficial in the developmental of cognitive skill and not those who independently construct their own knowledge.

According to the Vygotskian approach in cognitive development, learning is triggered by creating the Zone of Proximal Development (ZPD). The tutoring given by peers is in fact reflected by the ZPD. ZPD is a learning state located somewhere between the learner's real understanding and potential understanding. Vygotsky [17] claimed that the learners often find themselves in the ZPD for new learning under a presence of a knowledgeable person or capable peers.

Although Vygotsky [17] emphasized asymmetrical relationships in which, one assisting is more expert than the other, such as King [18], the neo-Vygotskian researchers claimed that peers can also contribute to individual learning. This can be referred to mutual tutoring or reciprocal given by peers. Apart from that, Vygotsky [17] also stressed that the appropriate assistance giving by the peers for the learner, which in ZPD for a particular task, will give them enough of an enhancement to achieve that task. Therefore, the particular task, which cannot be achieved alone by the learner, can be successfully achieved with the guidance of capable peers within ZPD.

Peer tutoring has been observed as varying in tutoring types or format according to peer tutoring scholars. Reliant upon the background conditions, peer tutoring groups may be cross-age or same-age, small or large, fixed or reciprocal, face-to-face or online or a preliminary trained or not [19]. Peer tutoring can be done on a one-on-one basis (dyad) and also can be done in small groups (3-5 persons in a group) where it can support the cooperative and collaborative learning takes place. In this study, at the university level, tutoring in the same year of university (i.e., freshmen, sophomore or senior) is often called same-level tutoring because of the heterogeneous composition of cohorts in higher education.

Instead of using the term same level tutoring, another term was introduced by Pigott et al. [20] promoted another mutual term tutoring called 'Reciprocal Peer Tutoring' (RPT) instead of using the same level tutoring. RPT is one of the most recently established forms of peer tutoring, which requires students to fulfil both tutor and tutee roles and is commonly done with same-ability and often same-age pairing. Due to its benefits towards students' learning, the interest in conducting RPT is increasing [21, 22]. However, based on the previous research, which examined academic achievement, self-efficacy, test anxiety, levels of distress and student satisfaction regarding the effects of RPT on the college level [23-25] have been reported mixed results.

On the other hand, most of the studies conducted on peer tutoring in a face-to-face setting. Only a few studies conducted in an online setting. De Smet [19] and De Smet et al. [26, 27] conducted a series of studies regarding implementing peer tutoring teaching practice in an asynchronous online discussion. The studies by De Smet et al. [26] focused on tutor training conditions; De Smet [19] on the peer tutor behaviour; De Smet et al. [27, 28] on the cognitive process of a peer tutor and on the impact of tutor training. All of the studies conducted by De Smet [19] and De Smet et al. [26-28] embedded the cross-age peer tutoring formats in a naturalistic higher education setting at Ghent University, which tutored the same subject matter domain, which is Instructional Science. However, the numbers of participants and research purpose of each study are varied with one another. Overall, the studies by De Smet [19] and De Smet et al. [26-28] focus more on peer tutor behaviour than the outcomes of peer tutoring teaching practice to students' learning. However, this study was focused on the educational outcome using the online reciprocal peer tutoring.

Moreover, the study conducted by De Smet et al. [26-28] using the Learning Management System (LMS) as a platform for learning. Thus, this study fills the gap to explore the impact of peer tutoring in an online setting using a social networking site as a platform to teach and learn with their peers.

As mentioned before, the leading SNSs is Facebook, which surpassing other social networks. Therefore, the researcher interested in investigating the learning occurs in a Facebook environment, which could be potentially established for academic-related matters, in order to encourage students' participation in learning.

Recently there was a growing number of studies regarding the potential for using Facebook as a means of teaching and learning. Research studies regarding the use of Facebook for teaching and learning have reported both positive [29] and negative findings [30]. A study by Wang et al. [29] showed that students were basically satisfied with the affordances of Facebook, as the fundamental functions of LMS could be easily implemented within a Facebook group. Possible reasons for this outcome included that younger students are more accepting of the idea of using a Facebook group as an LMS. In short, it can be said that Facebook might replace the functions of existing an LMS. Therefore, Facebook can be considered a medium for encouraging students' participation in the discussion of academic-related matters.

### **3. Research Method**

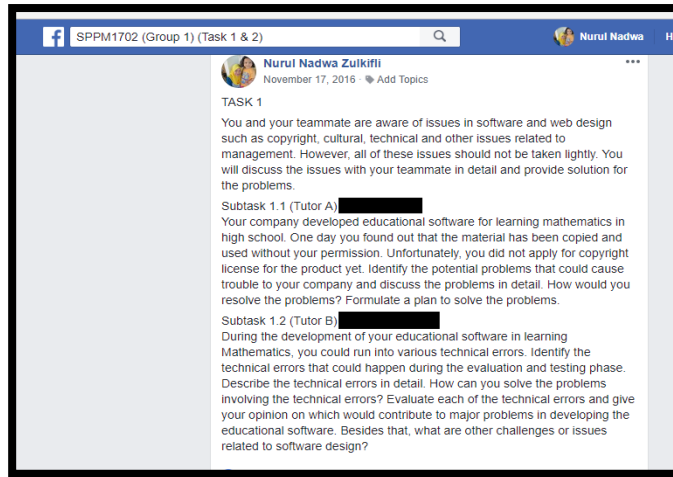
This study employed a quantitative research design using pre-experimental (Pre- and post-test) to investigate the effectiveness of an online reciprocal peer tutoring toward students' academic performance.

#### **3.1. Participants**

Twenty-nine undergraduate students who were undertaking Multimedia Application and Web Design course from one university in the southern region of Peninsular Malaysia were involved in this study.

#### **3.2. Procedure**

The pre-test that comprised of two sections, which are Section A consisted of 30 multiple-choice questions and Section B consisted of four structured questions were given to the students before the treatment. Total raw marks were 60. They completed the test in an hour and 30 minutes. During the treatment, the students were assigned randomly in 13 dyad groups and one triad group. In addition, the researcher created Facebook group (see Fig. 1) for each paired students. The rationale paired groups was chosen over small group, which consists of three to five participants because during the RPT session where the tutors and tutees role are reciprocal, a paired group is more suitable since each student has fair chances to enact the role of tutors and tutees. Falchikov [1] as a peer tutoring scholar, also suggested that the paired groups are more appropriate instead of small groups of three to five participants. However, one triad group was formed because of the total of odd numbers (N= 29) of students involved in this study. Moreover, students needed to answer four critical thinking tasks in the Facebook group within the duration of four weeks of treatment. After the treatment, the post-test was given to them to complete in an hour and 30 minutes.



**Fig. 1. Facebook group screen.**

### 3.3. Instruments

The pre and post-tests were constructed based on the syllabus of Multimedia Application and Web Design course. The questions in the post-test were similar to the ones in the pre-test in terms of difficulty levels, content and format. As mentioned before, the test comprised of two sections, which are Section A consisted of 30 multiple-choice questions and Section B of four structured questions. The validations of the performance test were conducted with two experts; one expert in subject matter to check the content validity and one expert in the English language to evaluate the clarity of the test.

### 3.4. Data analysis

A Wilcoxon signed rank test utilizing SPSS was administered at a 0.05 confidence level to determine the significant difference between the mean of pre and post-test scores.

## 4. Results and Discussion

The research questions examined the effect of online RPT treatment towards students' academic performance. Table 1 illustrated the comparison of the mean of pre-test and post-test of the students and the value of Wilcoxon signed rank test.

**Table 1. The comparison of mean percentages between pre and post-test and Wilcoxon signed rank test.**

	N	Mean	SD	Z-value	P-value
<b>Pre-test</b>	29	23.569	6.9304	-4.704	.000
<b>Post-test</b>	29	37.483	4.8394		

From Table 1, when examining the pre-test scores for all the students (N= 29), it was determined that the average score is 23.57% ranging from 12% to 40%. For the post-test score, the average score is 37.48% ranging from 23.5% to 44%. The difference in the mean percentage proved that students' performance improved after

the given treatment from the online RPT environment. A Wilcoxon signed rank test indicated that the online RPT environment was found to significantly influence the students' performance test ( $Z = -4.704$ ,  $p = 0.000$ ) with median performance test rating was 24.000 for pre-test and 39.000 for post-test. Thus, the treatment is likely to be positive in students' performance in the test.

The online Reciprocal Peer Tutoring (RPT) environments were proved to have a significant influence on students' performance test. This finding is in agreement with those of previous study [31], which found that students obtained better grades when the students made use of the online peer learning platform for learning crowdsourcing. This also seems to be consistent with the previous result [32], which found the success online peer learning in enhancing students' academic achievement and in the meantime facilitating their motivation in learning statistics using online peer learning.

Statistical analysis showed that there was a significant improvement in students' scores in pre and post-test. From the positive and encouraging findings obtained in this study, it shows that the online RPT environment has a successful future in our educational field.

## **5. Conclusions**

This study collected data from one university in Malaysia thus limited the study findings due to the small samples size involved as the participant. Thus, the findings cannot be generalized to other population because the sample size is not sufficiently representative. Future studies suggest that quasi-experimental study in different settings and subject course to determine whether the findings are produced the same results in another educational context. It can be expanded as a learning platform for other subjects such as science, mathematics, language learning and so on. Further research into it could make this online RPT useful to be implemented into online learning platform for other higher institutions. The treatment of the online reciprocal peer tutoring lasted for four weeks in this study, thus, it is suggested that at least a full semester to embed this strategy in future studies. A different peer tutoring settings such as cross-age (senior tutored freshmen year) is another setting worth exploring in future studies.

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