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TECHNOLOGY-SUPPORTED PEER FEEDBACK: A LITERATURE REVIEW

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Article Info	Abstract
	The technology advance in language learning has become a trend in research including the implementation of peer feedback. This study aims to explore the development of technology-supported peer feedback by reviewing 10 studies published between 2016 and 2020. The results found that all studies implemented peer feedback in higher education. Regarding the tools and system, most studies conducted asynchronous learning mode in giving and receiving feedback and the use of social media reached the highest percentage. Across most studies, individual peer feedback was adopted, but anonymity was not clearly mentioned. One-round feedback was mostly implemented and there were less follow-up revised tasks. Furthermore, most studies assigned students to give corrective and structured feedback. Of all studies, using technology in peer-feedback activities could give more opportunities for students to get engaged and motivated, but not significantly improve the students' performance, language and proficiency skills. For future research, it is suggested that researchers develop how to integrate effective technology tools into peer feedback in terms of building self-regulated learning as well as reaching learning values.

INTRODUCTION

Feedback on students' performance is mostly done by teachers to give awareness to students on their strengths and weaknesses. However, the practice of giving feedback has transformed from students passively receiving feedback from the teacher to peer feedback; and this type of feedback is known to be more powerful even in an online setting (Saidalvi & Samad, 2019).

Even though there are still some research arguing about the effectiveness

of peer feedback and consider it as a magic wand to improve language skills (Wu & Miller, 2020), the trend of web-based technologies has opened up more opportunities for peer feedback to be implemented comparing to the traditional classroom feedback which has limitations in terms of time and space (Luo, 2016). It is believed that online peer feedback or assessment influences quick students' learning progress as it provides better learning and evaluation than traditional methods and it can be more efficient than in a traditional classroom setting (Demir, 2018). More recently, the application of synchronous and asynchronous technologies has been reported to foster EFL/ESL learners' engagement in feedback (Saeed et al., 2018).

Therefore, by referring to the peer feedback models adopted by several studies for technology-enhanced language learning, the present study aims to explore the development of technology-supported peer feedback studies in the past five years in terms of school levels, technology tools and system, peer feedback rules, and learning values. Based on the research purpose, the following questions are addressed in this study:

1. What school levels participated in the technology-supported peer feedback research?

2. What kind of tools and system were used in the technology-supported peer feedback research?

3. What kinds of rules were implemented in the technology-supported peer feedback research?

4. What were the learning values described in the technology-supported peer feedback research?

METHODOLOGY

In the first stage, papers or articles related to peer feedback or assessment and technology were searched through the Web of Science database by using specific keywords such as 'peer feedback' OR 'peer assessment', 'online peer feedback' OR 'technology-based peer feedback' OR 'technology-supported peer feedback', etc. Then, the articles were selected based on the last five years

of publication, ranging from 2016 to 2020 and saved in Mendeley software. In the next stage, the full text of each paper was screened based on the following criteria:

1. Only journal research papers related closely to peer feedback or assessment, published in English from 2016 to 2020.
2. The papers should mention the use of information and communication technologies (ICT) concerning supporting peer feedback.
3. The papers should figure out important points including the school levels, technology tools, peer feedback rules, evaluation criteria, and the pedagogical values.

There were 102 articles about the themes downloaded by identifying the titles and reading the abstracts. After further reading, 10 articles were selected as they were considered related closely and met the criteria. Then, a table of the literature review was prepared to input the result of the reading analysis by including these items; the identity of the research article (author, year, publisher), identified problems and issued, aims/objectives, novelty/rationale and significance, implementation details, findings and conclusion, limitation and weaknesses, and areas of improvement or future suggested research.

FINDINGS

1.1. School Levels to Implement Technology-Supported Peer Feedback

Since all studies implemented the use of technology to support peer feedback, school levels became a careful consideration. In the papers, it was found that all participants are undergraduate or university students. It is assumed that the concept of peer assessment fits in with recent developments in university teaching, such as collaborative learning and writing, and real-life task performance (Van Weert & Pilot, 2003) cited in (van der Pol et al., 2008). Moreover, concerning the use of technology tools, online peer feedback needs high intensity for teachers and students to interact more often to exchange and monitor the students' product or performance so it may be considered complicated for the lower-level students.

It was found that all articles involved undergraduate students with different

grades as the participants, ranging from age 20-23 years. The size of the participants mostly ranged from 20-58 students, but there was one paper which took only 9 participants to represent the entire 3rd level of the university. The consideration of the small size was meant to get the effective engagement of the participants as well as more qualified feedback. Therefore, all participants were given training before and the instructor modelled the example of giving feedback in terms of comments and text revisions (Wu & Miller, 2020). The majors of the participants also varied, including EFL, science, arts, and business.

1.2.   *Technology Tools and System for Peer Feedback*

The exponential growth and development of technology in education open the field of language learning to explore various tools that can support the teaching-learning process as well as the assessment and evaluation system. It was found in the research papers that the technology tools used in the peer feedback were also varied as 5 years was a long range of time for technology to expand. The writer categorized the kinds of tools used to support peer feedback activities, including the models of peer interaction (synchronous or asynchronous; oral or written), the system (web-based, learning management system, social media, mobile application), and also the use of scaffolding.

Identifying the modes of peer interaction, it was found that 90% of the studies applied asynchronous mode to give and receive peer feedback with 80% applied written comments via the tools. The oral peer feedback was done in 2 studies with recorded video feedback presentations, and 1 of them applied synchronous mode via the university's learning management system.

The technology system adopted to support peer feedback was also varied. In tertiary levels, universities usually develop their own learning management system (LMS). However, of the 10 studies, the use of social media reached 40% by exploring the features provided in *Twitter* and *Facebook* (*Face Education Group, Facebook Group, The Café or the collaborative application for education*). The use of LMS reached 20% with the use of UTM e-learning and a feature in LMS called *Blackboard* as the discussion forum to give and receive feedback. 20% of studies applied web-based technology by exploring the use of video blogs and Turnitin with its feature for feedback which is called *PeerMark*. Mobile applications were rarely used, so it was found only 10% by using *PeerEval*. One study didn't even

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mention clearly the kind of tools supported the peer feedback but only mentioning the use of video peer feedback.

Scaffolding in the use of technology is also considered crucial as not all students understand how to explore the tools or applications which are used for peer feedback. There must be a kind of training or instructional scaffolds, so the students identify the steps of the tasks including what to do in the process of peer feedback. Instructional scaffolds for formative peer assessment, therefore, aim to support students in acquiring and consolidating knowledge and skills while tackling the combined demands of the core and the assessment task (Hoogeveen and Van Gelderen 2013; Van Zundert et al. 2010), cited in Deiglmayr (2017).

Concerning scaffolding, 2 articles did not describe the process of applying the technology tools in peer feedback, but 8 of them provided instructional scaffolds before the students gave and received peer feedback. The instructors or the researchers introduced how to use the tools or applications, starting from submitting or uploading their tasks to the rules or procedures of giving feedback. Some of them also provided forms as a guide for giving comments or feedback. In the paper written by Saeed (2018), the instructor even acted as a modeler who modelled the peer feedback in terms of comments as well as text revisions via the social media group.

1.3. *Peer Feedback Rules*

There are many interesting data found in the studies dealing with the rules and procedures of peer feedback. To identify easily, the writer categorized into some points of the rules which were then inputted into a table. The categories include anonymity, grouping type, feedback duration and rounds, types of feedback, and revised tasks.

Anonymity has become a high concern in peer feedback since it can influence some issues to succeed in the process. In classroom settings, non-anonymous peer review has been common since it is done in a class where everybody can see each other. In the online settings, anonymous may be applied but with various effects based on some studies. In higher education, students indicated that they felt more comfortable giving feedback anonymously in peer assessment (Raes et.al, 2015) cited in (van den Bos & Tan, 2019).

From the reviewed articles, it was found that most studies did not mention clearly whether the students put their names on the feedback. However, it was found that there were 2 articles assigned the students to use anonymous in their comments or feedback, while Saeed et.al (2018) in his article suggested the students to use fake names to create an account in the Facebook group. There is also one article written by Zaier et.al (2020) which did not clearly mention the issue of anonymity, but the students were asked to join an informal discussion forum on the university's LMS called *Blackboard* and provide feedback to their peers as well. For the unclear anonymity in the feedback, it is assumed that the researchers allowed the students to put their real names since they used social media and the university's LMS.

Regarding the grouping type, it was found that most studies adopted individual peer feedback. Three articles mentioned clearly about the use of group work to have discussions before giving feedback, but in the end, the students posted comments or feedback individually. It was found in the article written by Saeed et al. (2018) that the students were divided into three groups, and they discussed the feedback. Wu & Miller (2020) also organized the students into groups of five to have a business meeting case study, but each student was required to give feedback on their peer's oral performance through *PeerEval* application.

Duration and rounds of peer feedback also become considerations to analyze the connection to the results of the research. Regarding the duration, 7 studies assigned the students to analyze their peers' tasks and give feedback within two weeks. However, it was found in a study conducted by Luo (2016) that the peer feedback was implemented during the semester in 1.5 hours for each session, by using Twitter-mediated peer feedback. The rest of the studies (2 articles) did not explain clearly the duration of the peer feedback. Dealing with the peer feedback rounds, most studies did not state clearly how many times the students had to give feedback. However, by analyzing the procedures, it is assumed that the studies implemented only one round of peer feedback, except in the study conducted by Luo (2016) in which the students did the peer feedback every week. Therefore, it was done in more than one round.

When talking about types of feedback, it was found that 70% of the studies implemented corrective feedback in which the students had to consider some

important components in the feedback. As it is written in Yeh et al. (2019), the students should provide strengths, weaknesses, and suggestions to improve their peers' speaking performance. It is also supported by Tseng et al. (2019) who assigned the students to fill the provided rubric as a guide for giving feedback with the components of pronunciation, fluency, grammar, and word usage. However, there was 1 study which allowed the students to use any forms of feedback (Saidalvi & Samad, 2019) and another study even did not give specific instructions on types of peer feedback the students had to use (Luo, 2016).

To have more organized and focused comments on peer feedback, there should be a kind of evaluation criteria to facilitate learners. It was found in most studies that the evaluation criteria were developed by the teachers or researchers. Regarding with kinds of criteria, 50% of the studies adopted both quantitative and qualitative feedback by giving comments as well as grading scores, 30% assigned the students to only give qualitative one, and 20% allowed the students to give any specific types of evaluation. In relation to the qualitative feedback, it was found that most studies implemented structured feedback (80%), which meant the components of evaluation criteria for peer feedback were described in details, and even some studies provided comments rubric to guide the students what points they had to comment in the feedback.

To identify the next process after the peer feedback, the writer tried to analyze the follow-up or revised tasks to figure out whether the researchers gave comments on the feedback and assigned the students to do revisions. Most studies did not explain clearly whether they gave comments on the peer feedback. However, Yeh et.al (2019) requested the students to revise their video clips based on the feedback given by their peers then uploaded the revised clips to their blogs again. Tseng et.al (2019) also assigned the students to submit the revised videos after receiving the peer feedback. The rest of the studies did not assign the students to do revisions, but some studies asked them to do a self-assessment or evaluation to be reported via the technology tools they used.

1.4. *Learning Values in Technology-Supported Peer Feedback*
The benefits of using technology tools to support peer feedback come in many ways. Computer-mediated peer feedback, or called as online feedback, has been identified as giving advantages to overcome time and place constraints,

avoid the discomfort of face-to-face critique, give more opportunities for students to think about what to respond, also gives more time for teachers to monitor all students' performance and feedback (Yeh, H.-C., Tseng, S.-S., & Chen, 2019), and decrease the cost and logistical difficulties in administering paper-based peer assessment activities (Luo, 2016). Technology-supported peer feedback can give more opportunities for teachers to have more free time to focus on the learners' needs to getting more individual assistance (Alharbi & Al-Hoorie, 2020). Moreover, the rapid increase in the utilization of online learning environments and social network sites, such as Facebook, Twitter, Instagram, and LinkedIn, offers additional potential for the pedagogical use of peer assessment through feedback (Demir, 2018).

All papers focused mainly on the pedagogical values by figuring out the research aims and the results of the research. The learning objectives deal with speaking performance, writing skill, learning motivation, learning engagement, and critical thinking. Concerning speaking performance, Yeh et.al (2019) who aimed the research to investigate the effects of online peer feedback via blogs on the speaking performance, reported that there was a significant improvement in the students' speaking performance with the support of peer feedback, utilized by video blogs as the learning tool. It is different from the findings in other research which was conducted by Tseng et.al (2019) when comparing video feedback and written feedback and the impact on the speaking performance. It was reported that video feedback was more useful for only improving intonation, but not significantly improving fluency and pronunciation. Students perceived written feedback was more beneficial in terms of improving grammar and word usage. However, students' perception of technology use shows a positive orientation as it was reported by Wu & Miller (2020), that the use of mobile technology was a way to improve speaking performance.

Regarding the improvement of writing skill, there is no significant influence of the technology used in peer feedback. A paper which is written by Saeed et.al (2018) investigated more on the use of technology to engage EFL learners in writing. The findings show that learners engaged in peer feedback in the revision-oriented discourse as well as non-revision-oriented feedback comments but didn't address any issues in writing. In some cases, they failed to revise their essays

globally and resorted to revising them locally. However, the use of technology tool, in this case, was perceived as a way of mediating their learning and better understanding and as an asynchronous for peer feedback, it plays an important role in facilitating learners' feedback exchanges and foster their social and emotional/affective aspects of learning.

The previous issue leads to the students' learning engagement and motivation. Saidalvi & Samad (2019) found that the use of online peer motivational feedback in the e-learning websites was noted to provide positive feelings to the speaker as the positive words increase the students' confidence level to participate in future presentation sessions. It is supported by Demir (2018) who identified that the students perceived technology as a powerful strategy to make learning enjoyable, increase their self-esteem, improve their self-reliance, and increase their learning awareness. He also added that online peer assessment led to more student participation than regular classroom peer assessment. In line with the findings, Luo (2016), who conducted a study on the use of microblogging tool (Twitter) to provide peer feedback, reported that students perceived the use of Twitter as an engaging learning experience because 'it allowed everyone to speak in their mind'.

When talking about critical thinking, the use of technology in peer feedback is considered to increase students' critical thinking as long as it is processed double-blind or anonymous. It was found in the paper written by Alharbi & Al-Hoorie (2020) who applied the use of Turnitin for peer feedback, with a feature called *PeerMark*. Its function is to facilitate learners to read and comment on each other's essays. It was reported that the anonymity gave comfort to the participants so they could give critical comments freely and honestly. It is also in line with McCarthy (2017) who compared between online and in-class formative assessment feedback models. The students, especially the international ones, noted that online peer feedback gave them more benefits as it was more critical than the F2F one. They could have more time to consider their ideas and critiques more thoroughly before providing feedback. However, it is in contrast with one study which found that even when the feedback was specific, it ended up just being a narration what happened in the video without critical analysis or lacks specificity (Zaier et al., 2020).

DISCUSSION

Integrating technology into the teaching-learning process becomes a growing area of research even though it is not a simple task to do since it should be related to the latest technology trends. Researchers should be able to look for new and more specific measures to assess the pedagogical and educational values by using these new technologies (Caws & Heift, 2016) in Farr & Murray (2016). It also needs to highlight that technology is not the main assessors to assess students' performance and progress, but it is only a tool which can support the process, including the evaluation process. Therefore, ideally, it does not only take into account the learners, but also the tools used, their interactions as well as the outcomes (Caws & Heift, 2016) in Farr & Murray (2016).

Analyzing the 10 studies, the technology tools are also found as only a supporting media to facilitate peer feedback activities, not mainly as an assessor to give comments and scores. The use of social media (Facebook and Twitter) which reached the highest percentage to support feedback is considered motivating and engaging students in peer feedback activities as it provides attractive features, and it is assumed that all students have their social media accounts. Jones (2018) in Power (2018) states that to keep students motivated, teachers can use social media sites to access interesting resources they like.

When using the word 'support' in technology-supported peer feedback, teachers or researchers should consider the context, like in what extent that the tools may help and guide students to organize the comments in the feedback. A study by Bates and Sangra (2011) cited in Caws & Heift (2016) in Farr & Murray (2016) on managing technology in higher education, notes that while the flexible access to learning has increased, the quality of instructing with technology has not increased in a similar manner due to a lack of investment in training. However, from the 10 recent studies, the issue is changing. It was found that the researchers had advanced efforts to provide instructional scaffolding on the use of the tools as well as the feedback rubrics. Another attempt to modelling the comments for feedback and text revision is also proof of progressive efforts to help students understand the context in peer feedback. Chen (2016) in his article mentioned a study conducted by Liou & Peng's (2009) which found out that CMPR (Computer-

Mediated Peer Review) training, supported by a peer-review guiding sheet and a peer-review model demonstration, gave a significant effect on the students' quality of the comments with more-revision oriented.

By analyzing the results of the reviewed articles, the students have been trained and facilitated by rubrics and formats, but it seems like the comments on feedback did not meet all the expectations. Saidalvi & Samad (2019) in their study noticed that the students gave more motivational feedback instead of corrective feedback dealing with language and proficiency skills. The factors may come from their lack of language knowledge and their worried feeling of breaking up the friendship when they give corrections on their peer's language and proficiency skills. This is probably why anonymity becomes a consideration in peer feedback, although there are some insights which suggest that anonymity could have a different effect on the peer-review process of students of other cultures and disciplines (van den Bos & Tan, 2019).

In addition, regarding the feedback quality which did not meet the expectations for pedagogical values, the challenge might also come from the feedback rounds, duration, as well as the revised tasks. In most studies, the researchers only did one to two rounds with the duration mostly in two weeks, and no revised tasks submitted after the students received the feedback. Therefore, there is less opportunity for the students to improve their feedback quality and to revise their tasks. The role of instructors is crucial for they need to understand that evaluating the outcome of a task or activity is an essential part of the overall assessment for language learners who seek to position themselves in the learning context (Caws & Heift, 2016) in Farr & Murray (2016). It is in line with Felix (2005) cited in Caws & Heift (2016) who states that it is crucial for teachers or researchers to investigate how technologies might be impacting learning processes and as a consequence might improve learning outcomes.

CONCLUSION AND SUGGESTION

The review of the 10 articles on technology-supported peer feedback underlies several conclusions and implications which can lead to future research. First, technology-supported feedback is best implemented at the tertiary level regarding that providing feedback to one's peer (without possessing a high level

of expertise) is known to be difficult for students (Dochy et.al., 1999; Topping et.al., 2000) cited in (van der Pol et al., 2008).

Second, in the studies, using technology in peer-feedback activities could give more opportunities for students to get engaged and motivated, but not significantly improve the students' performance, language and proficiency skills. Therefore, teachers or researchers should evaluate carefully the capacity of the technology for its utilization in peer feedback and apply instructional scaffolds and training to help students understand how to utilize the tools to learn. Furthermore, monitoring students' interactions as well as giving comments on the students' feedback could be beneficial for students to improve the quality of the feedback.

Third, peer feedback rules should be carefully designed to reach the learning objectives. There were some important points to implement peer feedback including the anonymity, grouping type, feedback duration and rounds, types of feedback, evaluation criteria, and the follow-up tasks after receiving the feedback. However, not all studies concerned in detail on those items so some learning objectives could not be reached.

Finally, as most studies adopted written peer feedback, there is a need for further research on how to integrate effective technology tools in both oral and written peer feedback in terms of building self-regulated learning as well as reaching learning values.

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