

## **Cognitive Conflicts Emerged from Feedback from Peer Assessment and Artificial Intelligence: A Narrative Inquiry in an Indonesian EFL Writing Classroom**

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**ABSTRACT:** *This narrative study explores the cognitive conflicts that pre-service teachers experience during peer-assessment activities in an artificial intelligence (AI) facilitated academic writing course. This study applies a narrative inquiry research design to Indonesian English as a Foreign Language (EFL) writing classes. Three pre-service teachers pursuing an undergraduate degree in English language education at an Indonesian public university were recruited. The data were obtained from participants' stories, follow-up semi-structured interviews, and photos as an artifact to complete the data. The data was then analysed thematically. The participants' cognitive conflict experiences were gathered during process writing and peer assessment. The findings show that the cognitive conflicts experienced by the participants were mostly from old myths and false beliefs. It brings advantages to pre-service teachers. The cognitive conflicts support the critical thinking of pre-service teachers. They discussed the material in detail, explored the different ideas, and helped them to confirm the incorrect knowledge and misunderstanding among them. This finding also implies the need for pre-service teachers, in-service teachers, and teacher educators to critically consider the cognitive conflicts in an L2 writing classroom, particularly in madrasah tsanawiyah (junior high schools), madrasah aliyah (senior high schools) and higher education institutions contexts.*

Studi naratif ini mengeksplorasi konflik kognitif yang dialami guru pra-jabatan selama kegiatan penilaian sejawat dalam kursus penulisan akademik yang difasilitasi *artificial intelligence* (AI). Penelitian ini menerapkan desain penelitian inkuiri naratif pada kelas menulis English as a Foreign Language (EFL) Indonesia. Tiga calon guru yang mengejar gelar sarjana dalam pendidikan bahasa Inggris di sebuah universitas negeri di Indonesia direkrut. Data diperoleh dari partisipan, wawancara semi terstruktur lanjutan, dan foto sebagai bukti untuk melengkapi data. Data tersebut kemudian dianalisis secara tematis. Pengalaman konflik kognitif peserta dikumpulkan selama penulisan proses dan penilaian rekan. Temuan menunjukkan bahwa konflik kognitif yang dialami para peserta sebagian besar berasal dari mitos lama dan kepercayaan salah. Ini membawa keuntungan bagi guru pra-jabatan. Konflik kognitif mendukung pemikiran kritis calon guru. Mereka membahas materi secara rinci, mengeksplorasi ide-ide yang berbeda, dan membantu mereka untuk memastikan pengetahuan yang salah dan kesalahpahaman di antara mereka. Temuan ini

juga menyiratkan perlunya guru prajabatan, guru magang, dan pendidik guru untuk mempertimbangkan secara kritis konflik kognitif dalam kelas menulis L2, khususnya di madrasah tsanawiyah (sekolah menengah pertama), madrasah aliyah (sekolah menengah atas) dan konteks institusi pendidikan tinggi.

**Keywords:** *Cognitive Conflict, Peer Assessment, Academic Writing, Artificial Intelligence (AI).*

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## I. INTRODUCTION

Artificial Intelligence has been widely used worldwide as an impact of the advance of technology and the increase of global interconnectedness (Fu et al., 2019);(Naghdipour, 2016). As a result, exponential growth has changed how it works and communicates. Therefore, good writing skills equip learners with various advantages that lead them to effective international communication (Lin, 2019). Academic writing is pivotal in influencing students' educational achievements; academic papers are all for students' academic needs (Gillett et al., 2009). They all agree that academic writing as a skill necessary for educational context substantially influences the extent of students' research papers production and publication in a university setting to complete their degree requirements. Assessment of students' academic writing is considered an indispensable component of excellent writing skills (Liu & Brantmeier, 2019). It is worth assessing students' writing skills to improve their competencies.

Concerning to writing process, effective writing instruction has to shape good writing habits among the learners to carry out written tasks more effectively (Baker, 2016). One of these good habits is to encourage students to improve the quality of their writing according to the feedback they receive on various dimensions and pieces of their paper. In line with this, peer assessment allows students to reflect on knowledge, rebuild their ability, integrate ideas, solve misunderstandings, and share understanding. Many of these activities, such as combining ideas, also deepen knowledge study. For this reason, peer assessment has been incorporated as an innovative learning approach for higher education students. Most of the time, it is proven effective in providing important educational value for learning (Topping, 2010).

Various studies have proved the importance of peer assessment activities on writing competencies. Li et al. conducted a meta-analysis study to investigate the elements likely to impact the peer assessment effect, and the essential aspect is rater training (Li et al., 2020). In addition, computer-mediated peer assessment is related to increased academic achievement than paper-based peer assessment. Several factors (including rating format, rating criteria, and frequency of peer assessment) have apparent but need to be statically meaningful effects.

Another research conducted by Fathi & Khodabakhsh, investigated the impact of self- and peer-assessment practices on Iranian EFL learners' writing anxiety and found that self-assessment and peer-assessment practices considerably reduced the students' writing anxiety (Fathi & Khodabakhsh, 2020). For that purpose, this study included 46

primary English students in two full classrooms at an Islamic Azad University in Iran. Nevertheless, later analysis found that on the post-test, the students' writing anxiety in the peer-assessment group was much lower than in the self-assessment group, indicating that peer-assessment practices were much more helpful in reducing the students' fear of writing.

In the current development of technology, Lee used a mixed-methods study to perform a longitudinal case study to examine how two Korean university students enhanced their English writing skills throughout a year using the automated writing evaluation (AWE) application, Criterion (Lee, 2020). For a year, the students produced papers outside of class every month, producing the first and, subsequently, second versions. The students underwent a TOEIC writing test at the start and conclusion of the study, and interviews and diary entries also explored their observations on their writing growth. Comparing scores, mistakes, quantitative fluency, and grammatical complexity measurements revealed that writing had improved. Both individuals utilized Criterion feedback well to make informed decisions and repair errors. Essay rewriting based on Criterion feedback resulted in more self-directed learning and increased writing comfort in topic courses. The impact of AWE feedback should translate to long-term improvement. The findings suggest that using AWE in individual out-of-class writing activities might be beneficial.

Another experimental study was conducted by (Yao et al., 2021). They investigated and focused on the linguistic mindsets framework, which offers a new approach to understanding the emotional components of second-language authors. Chinese university English major students were chosen and allocated to one of two groups: experimental (264 students) and control (256 students). Both groups received syllabus-based English writing instructions, but only students in the experimental group participated in three peer assessment sessions supported by AWE software. According to the study's findings, students in the experimental group helped a more positive growth attitude and maintained a high motivation throughout time.

Furthermore, the experimental group of students demonstrated that the influence of peer assessment practices on students' linguistic attitudes and motivation differed, which may be attributed to their own experiences and perceptions of the activities. Moreover, the cause was related to a developing perspective throughout time. The findings show that AWE can enhance peer evaluation activities in L2 writing courses to help students develop a more optimistic mindset.

The related studies are in the same context as our study that technology-facilitated peer assessment has the potential chance to help students in Academic writing courses. The first study discussed how university students resolve cognitive conflicts when obtaining ideas and errors from their peers in online text revision. Then, the second two studies used the experimental method while our research implemented narrative inquiry. In the end, the last two studies explained the role of automated writing evaluation (AWE) application enhanced their L2 writing skill. In contrast, this study focused on the cognitive conflict that emerged in the peer-reviewing activity in the academic writing course.

In the Indonesian context, academic writing skills are essential, especially for the pre-service English teachers responsible for teaching English as a foreign language to Indonesian students. The teaching of writing has been introduced from the students in grade 7 up to the undergraduate and graduate university levels. In Islamic-based

education institutions in Indonesia, such as Islamic junior high schools or *madrasah tsanawiyah* (MTs), Islamic senior high schools or *madrasah aliyah* (MA), and Islamic state university or Universitas Islam Negeri (UIN), English also always becomes the core subject, in which the teaching of writing is one of the integrated skills included in their curriculum (Ikhwan, 2022). Additionally, the pre-service English teachers must write a thesis to graduate with their undergraduate degrees. Therefore, the cognitive conflicts they dealt with during peer assessment helped them learn academic writing better. It encouraged them to reflect critically on their understanding and respond to their peers' feedback. Although the individual gains of cooperative and collaborative learning have been well-studied, the effects of cooperative learning have yet to be widely addressed. To generate various knowledge structures, students need to receive diverse and even conflicting perspectives from knowledge interaction. However, the cognitive conflicts experienced by pre-service teachers during peer assessment activities in artificial intelligence (AI) facilitated academic writing courses have remained under-researched. As a result, this study attempts to investigate the cognitive conflicts experienced by pre-service teachers during peer assessment activity in artificial intelligence (AI) facilitated academic writing. This present study gains a more profound understanding of pre-service teachers' cognitive conflicts during the peer assessment activities by using narrative inquiry and then employing thematic analysis to discuss other research results.

## II. METHOD

This research applied a narrative inquiry process in qualitative methodology. This is narrative inquiry research using the concept of (Barkhuizen et al., 2014). They stated that narrative research puts together narrative and study by using stories as research data, narrative as a data analysis method, or by presenting results. In line with this, this research follows a narrative inquiry as to the research design, with an in-depth analysis of the stories written and the interview after peer assessment, then completed by photos.

This study has three data sources: photos, pre-service teachers' stories, and interviews. The interview is used to gather data from people about opinions, beliefs, and feelings about situations in their own words (Ary et al., 2010). The participants are recruited through purposive sampling. The participants are students at the Department of English Language Education who experienced peer assessment activities in artificial intelligence (AI) facilitated Academic Writing course. The researchers asked participants to complete narrative frames with statement starters to guide them in recollecting their experiences. Peer assessment in this study was conducted in the Academic Writing class in the Department of English Language Education at a public university in Indonesia. It has been implemented for three months in April–June 2022.

Furthermore, the photos of pre-service teachers' worksheets that AI provides are used in this study. The three pre-service teachers had been selected. The participants, such as Aisyah, Zaynab, and Habibi, have been assigned pseudonyms to keep their identities. The participants' backgrounds are presented below.

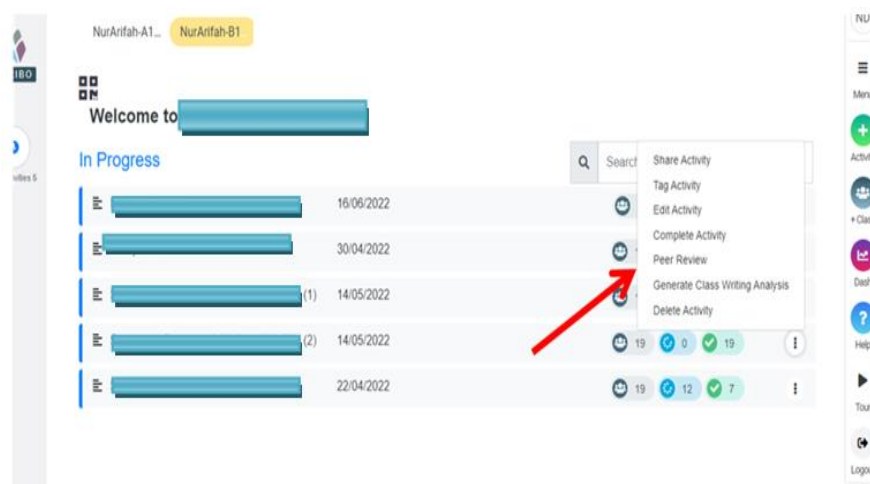
**Table 1. Participants Backgrounde**

No	Pseudonyms	Age	Year	Gender
1	Aisyah	19	2020	Female
2	Zaynab	20	2020	Female
3	Habibi	20	2020	Male

The next step after collecting the data is analyzing the data. I employed thematic analysis to analyze the data. The thematic analysis model is proposed by Barkhuizen. The analysis procedure contains three activities: 1) reading data repeatedly, 2) coding and categorizing the data extracts, and 3) recognizing the thematic headings. Thus, the data analysis is a description of both the story and themes that emerge from it (Ikhwan, 2020). In this research, the data analysis steps started with gathering the raw data. After the data was collected, the researchers read the data repeatedly to ensure that the data matched with the supporting data, such as the results of participants' interviews. Then, reducing the data to find the critical information related to the topic. Lastly, the researchers thematically coded the data that matched the issue and categorized the data by theoretical coding or linked the data with the theoretical concept.

### III. RESULT AND DISCUSSION

The finding and discussion covered two types of cognitive conflicts in this study. The first is the cognitive conflict formed from old myths and false beliefs by presenting the conflict between peers. The second type is the cognitive conflict that emerged during an artificial intelligence (AI) facilitated academic writing. Artificial Intelligence, namely Scribo, enabled the process of peer review.



**Figure 1.** The display of feature provided by Scribo

In assessing peers' work, students must evaluate the performance of their peers. It is necessary to have a specific level of expertise in the field being estimated (Topping, 2018). Metacognition is awareness and regulation of someone's thinking process (Stephanou & Karamountzos, 2020);(Flavell, 1987). As a result, peer assessment is authentic to evaluating students' work while contributing to developing critical thinking and metacognitive skills. For that reason, Topping proposes cognitive conflict as a peer assessment process (PA). This is required to break cognitive blocks produced by false ideas. Cognitive conflict could be seen when the pre-service teachers reflected

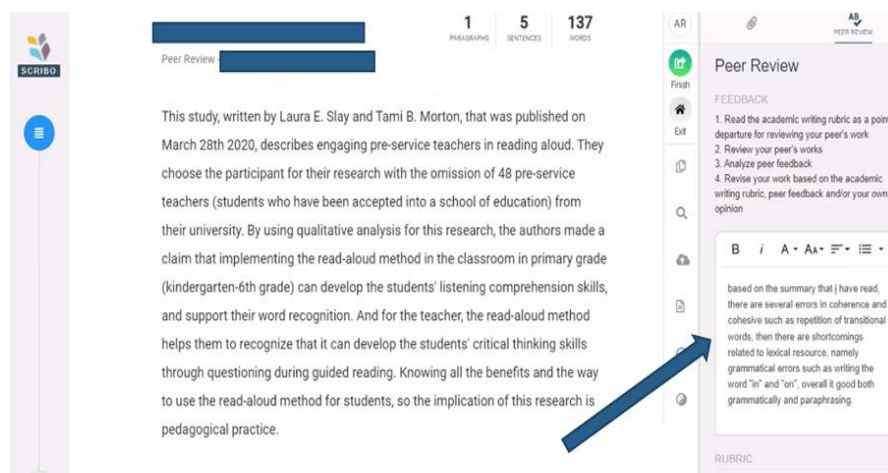


well as they can then it is required to break cognitive blocks produced by false ideas. In other words, when students face a problem, they quickly face the dilemma of opposite opinions. This activity is known as cognitive conflict. However, students from Islamic-based education institutions in Indonesia must amicably settle their cognitive disputes to primary teamwork. As a result, good conflict management among individuals is critical to personal cognitive processes (Ikhwan, 2018).

### **Pre-service teachers' false beliefs arise when peer expertise can be a consideration to review friends' works**

Pre-service teachers are responsible for providing suggestions and feedback on the work of their friends. Pre-service teachers reflected on their abilities and compared them with friends' abilities. Nevertheless, Pre-service teachers also assumed that their powers needed to be qualified to provide feedback on peers' work. They realized that their average skills were similar to each other. They considered their abilities to be limited to themselves and were not worthy of judging the talents of others.

“I am not sure I can give suggestions and comments because my ability is limited to writing according to my basic understanding. I try totality in giving feedback. The feedback I provide follows the specified rubrics such as grammatical range and accuracy, Coherence, and Lexical.” (Zaynab's story using the narrative frame, 21 August 2022).



**Figure 3.** The example of feedback from peer facilitated by Scribo

Scribo had a feature that supported the pre-service teachers to give feedback directly. The input can be delivered, such as a direct message from the peer. Then the peer who receives the feedback can respond directly to the peer responsible for giving the suggestion. In figure 3, the participant explained the feedback using proper grammar, compound sentences, and complex sentences based on the participant's understanding. Additionally, this feature can be used by students at Islamic schools or public schools in Indonesia to facilitate peer review activity.

Conflicts are inevitable and inescapable among the students in the group. Peer assessment entails active engagement, interaction, and communication of various knowledge areas, naturally leading to knowledge exchanges (Zhu & Carless, 2018). The pre-service teachers claimed they consider friends' expertise as peer review partners when involved in the peer review process. Varied abilities lead to conflicts between peers. Ability levels can also be regarded as the same or different according

to their skills. In assessing their peers, students must evaluate the performance of their peers (Idris et al., 2019). It is necessary to have a specific level of expertise in the field being estimated (Topping, 2018). Therefore, students considered less qualified can add to the complexity of the process and influence the readiness to review. Thus, it can lead the conflict between peers.

### **Pre-service teachers consider the feedback from peers before revising the text**

After reviewing, in the same way, pre-service teachers got feedback from the peer they were paired with. For example, after Zaynab responded to feedback given by her peer, she did not agree with some of the feedback she got. She preferred to first criticize the feedback before revising her writing. Zaynab believed that her peer was at the same level of knowledge. Therefore, it was essential to consider the input before refusing or accepting feedback from their friends.

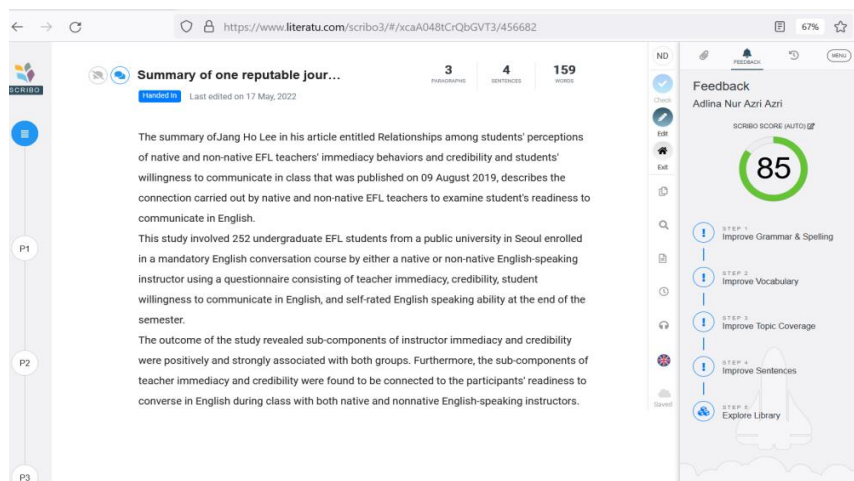
“However, not all suggestions or feedback are acceptable because, in my opinion, I should be critical in considering suggestions. After all, we are on the same learning level. So overall, our abilities are equal and require consideration before revising peer-reviewed writing draft.” (Zaynab’s interview on August 2022).

“I do not receive this (feedback). I also filter out helpful and acceptable suggestions. Because we are both still learning, and I do not expect much from my friends” (Habibi, story using a narrative frame, 21 August 2022).

Peer feedback may contain errors, and receivers must consider it before deciding whether to follow their peers' comments and alter their work. Moreover, students should convey their opinions to their peers and offer constructive comments, necessitating communication skills. Pre-service teachers have the consideration before accepting feedback from peers. The concern can help them to analyze in detail and recall the knowledge that had been learned. They believe that good feedback can help them to improve their writing. Yang suggested considering local revision (grammar corrections), global revision (text style, structure, or development adjustments), and perspective revision (e.g., seeing their works from the viewpoints of readers) (Yang, 2010). Therefore, pre-service teachers can stimulate critical thinking when they consider peer feedback. Additionally, they can respond to the feedback given by their peers without the need to change their drafts. Otherwise, the students revise their writing product after receiving their peer feedback.

### **Cognitive conflict emerged during artificial intelligence (AI) facilitated academic writing**

The participants declared that they had no experience practising Academic Writing facilitated by Scribo. They experienced, for the first time, being enabled by artificial intelligence (AI). Through the features provided by Scribo, pre-service teachers can get automatic writing feedback. Artificial intelligence (AI), namely Scribo, provided automatic feedback only on sentence structure and grammar. It means that the input given is considered less academic. In this case, the pre-service teacher regretted that AI did not reach the substance or context of the writing. Participants expected that Scribo would provide feedback in context and writing. However, it only focuses on the essay without considering its context and overall content.



**Figure 4.** *the example of automatic feedback provided by Scribo*

Scribo claimed that it provides all levels of learning to develop their English writing skills while saving work hours for both students and teachers/lecturers. After using Scribo for one semester, pre-service teachers emphasized that Scribo helped to revise the writing draft. Scribo covers grammatical errors, word choice, synonyms, spelling, and sentence structure. However, the pre-service teachers agreed that the scribe needed to reach the feedback in the context of the Academic Writing course at the university.

With technological advancements, AI has created innovative educational experiences in assessment, mentoring, content development, and feedback. Koltovskaia, the new writing apps can be adaptable and time-saving (Koltovskaia, 2020). However, AI capabilities get various responses from users, especially pre-service teachers. Pre-service teachers first analyze the feedback received from the automatic feedback provided by AI. The AI interpretation of students' thoughts can be biased and inconsistent; sometimes, an AI system can fail a student since he uniquely formulates his thoughts (Gabriel et al., 2022). In this study, cognitive conflict arises when the pre-service teachers receive and respond to the automatic feedback from Scribo. The participants emphasized that AI provides feedback around the structure of sentences only, and the input from Artificial Intelligence is not capable of academic writing in university. In line with this, Zhai & Lu explained that AI's strengths and weaknesses could imply future opportunities to answer the possible AI adaptation (Zhai & Lu, 2020).

The pre-service teachers have learned in university for three semesters. They needed to improve their academic writing skills, especially in the Academic Writing course they took in the fourth semester. Capturing their needs, the lecturer implemented a scribe to support their learning tools. The new AI Applications have a thorough instruction and plagiarism-checking component that may help ESL students advance their writing process (Zawacki-Richter et al., 2019). Furthermore, in higher education, the concept of AI combined with online learning is rising, which can provide new chances to improve pedagogical versatility, learning process or result, and feedback responsiveness.

In conclusion, artificial intelligence (AI) has limitations in adjusting the students' needs at the university level. The participant mentioned that Scribo provided automatic feedback on the structure of the sentences. AI's inability to think creatively

beyond the box is a significant drawback. AI can learn over time using pre-fed facts and previous experiences, but it cannot take a creative approach. Therefore, this study found the broad limitation side of artificial intelligence. Additionally, this study suggested to see the development of artificial intelligence (AI) into two sides; advantages and disadvantages.

#### **IV. CONCLUSION**

In this narrative study, the researchers examined cognitive conflict experienced by the pre-service teachers during peer assessment activity in artificial intelligence (AI) facilitated academic writing courses. Peer assessment changes the traditional teacher-centred and teacher-dominated teaching mode, manifesting the constructivist idea that students are the centre. From the results of this study, there are some highlighted conclusions. The first is the cognitive conflicts during peer assessment can help pre-service English to reflect their academic writing competence by comparing their knowledge with peers. Second, false beliefs were found and showed that peer expertise needed careful consideration, stimulating participants' critical thinking. In line with this, they can improve their critical thinking by considering their peers' feedback after peer reviewing. In short, this study suggests seeing cognitive conflicts as part of peer checking that may bring insightful advantages.

This study highlighted the cognitive conflict that emerged during artificial intelligence (AI). The new phenomenon of cognitive conflict has become an essential part of AI-facilitated academic writing. The pre-service teachers concluded that AI provides feedback around the structure of the sentences only, and it could not support academic writing at the university level. In conclusion, it was important for a student writer to clearly express his agreement or disagreement with peers' corrections and the automatic feedback from AI. With agreement or disagreement, a student writer could take action to revise the text.

This research is helpful for all levels of education, both in Islamic focus schools and public schools. Teachers at all levels of Islamic schools or madrasahs and lecturers at Islamic state universities or Universitas Islam Negeri are suggested to view conflict cognitive as a critical component in providing and responding to feedback in the Academic writing class. The benefits of cognitive conflict can be reached by all students who study writing as an applied lesson. Additionally, it recommends that in-service teachers, teacher educators and pre-service teachers of English who will teach English consider the students' cognitive conflicts seriously by analyzing the cognitive conflicts happening in class. Cognitive conflict management can benefit students when they are involved in English learning. However, this study has limitations that future researchers could cover better. The study was conducted in one class and focused on pre-service English experiences. Therefore, this study recommends that future researchers conduct and explore cognitive conflicts in several courses and include other conflicts during peer review.

#### **V. ACKNOWLEDGEMENTS**

This study suggests that pre-service English teachers use Scribo with artificial intelligence (AI) technology to facilitate the Academic Writing course. Then, in-service teachers and teachers educators or lecturers can implement peer review

activities in the online Academic Writing course. They can monitor students' work by using it. Additionally, this study recommends that future researchers conduct and explore cognitive conflicts in several classes, either online, face-to-face, or hybrid, and include various levels of education and different kinds of conflicts, other than cognitive conflicts, during peer review activities, further researchers need to consider exploring more than one sub-process of peer assessment or possibly cover the whole process of peer assessment.

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