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# Facilitative Effects of Feedback Delivered via a Social Q&A Platform in the English-Medium Instruction Context

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English is becoming the global language of business, education, science and scholarship, and English-medium instruction (EMI) in higher education is a rapidly growing, multidimensional global phenomenon. Previous research on EMI has predominantly highlighted the forces driving this phenomenon, implementation challenges, and stakeholders' language proficiency and attitudes, while very few studies have discussed changes in pedagogical practices to improve the quality of EMI at the micro level, particularly in the Asian context. This article investigates the effects of formative feedback delivered via a social Q&A online platform on learners' performance and motivation and explores students' perceptions of the use of the platform. It analysed pre-test, post-test, and questionnaire data from 130 students enrolled in an English-mediated business course at an EMI university in South Korea. These data were supplemented by the focus-group interview with eight students. The findings suggested that the application of the platform was viewed favourably by the students and that technology-mediated feedback significantly enhanced their writing performance and motivation, increased their language and content knowledge, and supported their active engagement. The findings have several pedagogical implications for other EMI contexts.

**Keywords: English-medium instruction, EMI pedagogy, technology-enhanced feedback, social Q&A platform, learner-centred teaching**

## Introduction

The use of English-medium instruction (EMI) is becoming mainstream in higher education (HE) around the world, and internationalization has become an increasingly important consideration for academic institutions that wish to expand their campuses, enhance their educational and research networks, attract international faculty and students, promote study-abroad programs aimed at widening students' linguistic and cultural horizons, and prepare students for the global employment market (Macaro, 2018; Walkinshaw et al., 2017). As a global phenomenon, EMI has gained particular popularity in the Asia-Pacific region for several reasons: (1) English being an official working language of international organizations such as the Association of South-East Asian Nations (ASEAN) and Asia-Pacific Economic Cooperation (APEC) for trade, diplomacy and scholarship; (2) growth of the HE sector in the Asia-Pacific region, which represents a large number of internationally mobile students; and (3) government policies (e.g., implementation of bi/trilingual curriculum in countries with colonial pasts, such as Singapore and Hong Kong) (Fenton-Smith et al., 2017).

EMI was defined by Macaro (2018) as "the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language (L1) of the majority of the population is not English" (p. 19). Thus, with the implementation of EMI policies in the second language (L2) HE contexts, students are competing for grades both academically and linguistically. Thus far, the language proficiency of both teachers and students, as well as their perceptions and attitudes, have been the most heavily researched area in EMI studies (e.g., Aizawa et al., 2020; Hu, 2019; Hultgren et al., 2015), which is understandable, as the subject matter in EMI is delivered and received in stakeholders' L2 (Chen et al., 2020). On the other hand, very few studies have addressed specific pedagogical practices aimed at improving EMI students' learning (e.g., Chou, 2016; Kim, 2018; Kim & Kim, 2021).

Many EMI researchers (e.g., Macaro & Han, 2020) concur that changing the conventional unidirectional lecture format to a more interactive pedagogy will enable students to advance more quickly in their comprehension of academic topics and their command of English. One of the most effective teaching strategies for interactive learning is teachers' feedback, a key element of the incremental process of ongoing learning and assessment (Hattie & Timperley, 2007). As the foundation of formative assessment, timely, high-quality feedback is considered to be a critical agent in both improving student learning and developing teacher-student relationships (Carless, 2020; Winstone & Carless, 2019). However, feedback provision can often be a time-consuming and highly repetitive process, particularly in large classes (Henderson et al., 2019; Winstone & Carless, 2019). Therefore, identifying new ways of providing feedback has the potential to resolve these issues and enrich EMI learners' experience. Having grown up with a wide array of technology at their fingertips, current students have radically different expectations and values, prefer active learning to passive learning, and expect instant feedback (Sarkar et al., 2017). As a result, traditional teaching methods may no longer be effective, and teachers need to incorporate innovative technology into their curricula to improve learning outcomes. The main objective of this research work was to investigate the effects of technology-enhanced formative feedback on learners' performance and motivation in a business course taught 100% in English. The feedback was delivered via a social question answering (SQA) online platform that supports a collaborative e-learning environment.

The study reported in this paper was guided by the following research questions:

(1) What are students' perceptions of the learning benefits and limitations associated with the use of an SQA online platform in the EMI classroom?
(2) What are the effects of formative feedback delivered via the SQA platform on students' content and language learning in the EMI classroom?

# Literature Review

## Teaching Methodology in an EMI Context

EMI refers to an instructional model of teaching academic subjects in English in countries where the first language of the majority of the population is not English, and it aims to facilitate the simultaneous acquisition of content knowledge and English skills (Dearden, 2015; Macaro, 2018). A plethora of research has been done on stakeholders' perceptions, beliefs and attitudes regarding the implementation of EMI in various contexts (e.g., Hu, 2019; Hultgren et al., 2015; Kim, 2014) and on problems and challenges for EMI (e.g., Aizawa et al., 2020; Kim, 2017).

As EMI gains momentum in HE worldwide, one major concern has been whether EMI teaching quality encompasses "not only English proficiency and teaching skills through L2 but also skills of instruction in respective academic disciplines" (Macaro & Han, 2020, p. 219). In recent years, there has been an increasing amount of literature on the professional development of EMI teachers, mainly describing faculty perspectives on EMI certification at institutional, national and international levels, as well as



collaboration between language and content specialists (e.g., Lasagabaster, 2018; Macaro & Han, 2020). According to Dafouz (2018) and Duong and Chua (2016), the problem is that newly designed EMI teacher education programs mainly focus on improving lecturers' English language proficiency to teach effectively in increasingly international classrooms rather than on their development of discipline-specific pedagogical competence. Interestingly, these training programs are often conducted by language specialists rather than education experts (Werther et al., 2014), leaving EMI teachers to develop their own teaching methods. It is notable that very few studies (e.g., Chen et al., 2020; Chou, 2016; Kim, 2018; Kim & Kim, 2021), especially in the Asian context, have focused on microlevel solutions, i.e., changing teaching methodologies to achieve EMI goals of acquiring both language proficiency and content knowledge (Dearden, 2015; Macaro, 2018).

Given the increasing demands being placed on both EMI educators and learners, this study sought to contribute to the EMI literature by introducing a specific instructional practice, i.e., *technology-enhanced formative feedback (TEFF)*, intended to enrich students' content and language learning experiences while yielding the most robust outcomes.

## Formative Assessment and Feedback

The main purpose of formative assessment is to monitor the development process in student learning, identify challenges and address them in a timely manner (Winstone & Carless, 2019). Typically, formative assessment involves feedback that focuses on the details of a student's work and forms the foundation for learner autonomy and scaffolding for higher achievement (Chou, 2016; Gibbs & Simpson, 2005; Kim, 2018; Kim & Kim, 2021). The provision of quality feedback is widely recognized as a professional skill of teachers (Carless, 2020; Hattie & Timperley, 2007). Gibbs and Simpson (2005) proposed several feedback conditions under which assessment can positively affect learning and student performance:

- provided frequently and in detail;
- focused on students' performance, their learning and the actions under their control, rather than on the students themselves;
- timely, in that it is received while it is still relevant to students;
- appropriate to the goal of the assessment and its criteria for success;
- relevant in relation to students' understanding of tasks, learning, knowledge, and the discourse of the discipline;
- received, paid attention to and acted upon.

The above factors are in line with other studies that conclude that formative feedback can be helpful to students in reflecting on their strengths and weaknesses and encourages them to concentrate on improvement in the learning process, rather than grade outcomes, by addressing the gap between their actual performance and the teacher's expectations (Boud & Molloy, 2013; Carless & Winstone, 2020).

Despite the widespread recognition of the value of teacher feedback, as a common pedagogical practice, students' expectations and teachers' intentions regarding the effectiveness of feedback are often misaligned. Educators have consistently complained about students' lack of engagement and responsiveness to feedback, with students allegedly only concerned with grades, resulting in teachers wasting their effort, energy, and time (Boud & Molloy, 2013; Henderson et al., 2019; Winstone et al., 2017). On the other hand, students' disengagement or passive responsiveness can be attributed to a number of factors, including teachers' ambiguous or generic comments, which may discourage further learning (Winstone et al., 2017); comments written in an overly negative tone demotivating the feedback recipient (Robinson et al., 2013); and affective factors involved in feedback, such as power imbalances, harmony and a need to save one's face in public, especially in Asian cultures (Zhan, 2019).

Feedback provision alone does not "magically" boost learners' skills or grades without their own



engagement and uptake (Boud & Molloy, 2013; Carless & Winstone, 2020); therefore, students themselves should become proactive recipients and engaged users of feedback to develop both more well-written texts and their writing abilities (Winstone et al., 2017). Consequently, there is a need for two-way communication and teacher-student partnerships to reduce discrepancies between stakeholders, enable the "appreciation of each other's positions" and contribute "to the mutual development of feedback literacy" (Carless, 2020, p. 437). The methodology used in the present study relied on the students paying attention to the feedback on their written assignments and using the feedback as a guide to enhance their learning and improve their chances of the successful completion of an EMI course.

Furthermore, over the last decade, attention has turned towards how technology may be used to scaffold learner engagement with teacher feedback and facilitate the relational aspects of the feedback communication process (Carless & Winstone, 2020; Kim, 2018; Odo, 2021). Therefore, the current study examined this issue specifically in the context of EMI.

## Technology-Enhanced Teaching and Learning in HE

Technology has increasingly been incorporated into HE, including the specific context of formative assessment and feedback, as it offers many potentially creative opportunities for educational innovation (Hast, 2020; Timmis et al., 2016). As Timmis et al. (2016) argued, these opportunities include new forms of representing knowledge and skills, crowdsourcing and decision-making opportunities in assessment, support and enhancement of collaboration, innovation in recording students' progress, and enhancement of feedback provided to students.

College classrooms across the world are experimenting with various digital tools, such as Facebook, Twitter, and blogs. Although not explicitly designed for educational purposes, these platforms have the capacity to share content and feedback and facilitate interaction and collaboration among users (Alsamadani, 2017; Awidi et al., 2019; Bailey & Judd, 2018). Alsamadani (2017) claimed that the use of blogs improves learners' writing subskills (e.g., content development, language mechanics, style, word choice), collaboration skills and confidence; increases motivation; and provides opportunities to practice autonomy, inquiry learning and critical thinking. Despite the merits of social media, Hershkovitz and Forkosh Baruch (2019) identified several drawbacks of using social media in the classroom: excessive exposure of students' and teachers' personal and private information; a paradigm shift in the student-teacher relationship (authority-related issues after becoming Facebook friends with teachers); and improper behaviour and identity issues in the context of communication (mutual use of inappropriate language, etc.).

Although educators suggest several solutions on how to deal with those problems, for instance, by establishing some ground rules prior to officially using the platform for online discussions (e.g., using an appropriate tone and language; avoiding posting inappropriate material) (Awidi et al., 2019), there is a need for safer, more attractive ways to connect students beyond the offline classroom while ensuring that students are not distracted by nonacademic matters and that their personal information is not overexposed. This is where SQA applications come into play. SQA tools are created specifically for productive, asynchronous academic discussions and are considered to be valid alternatives to Facebook and Twitter (Grasso, 2017; Vivekananthamoorthy & Venkata Subramanian, 2019). Piazza, an integrative SQA platform utilized in the present study, offers a systematic way to facilitate a collaborative e-learning environment both inside and outside the classroom (Blooma et al., 2013; Grasso, 2017; Vivekananthamoorthy & Venkata Subramanian, 2019). Blooma et al. (2013) argued that "interactions of users in SQA services in the form of a question, answer, discussion, or endorsement embed both mutual interest and mutual effort" (p. 110).

While previous research on Piazza has been mostly descriptive and related to how students use the tool in their studies and what perceptions they have of its impact on the creation of a community (Grasso, 2017), the provision of formative feedback to students via SQA applications has been insufficiently explored. Moreover, TEFF has remained underresearched in the EMI environment. Therefore, the present



study aimed to bridge these research gaps and offer practical insights for EMI research, particularly in terms of the context and teaching methodology, by exploring students' perceptions of the impact of TEFF on content and language learning to determine whether this form of feedback could help address motivational issues in the EMI context. Accordingly, the e-learning framework used in this study had two dimensions: (1) *technology* which included an SQA tool and online collaboration and communication, and (2) *pedagogy* which included TEFF in particular and other teaching and learning activities to scaffold the learning process (Kong, 2021).

## Method

A mixed-method approach was used in the present study to address the proposed research questions. This approach is often employed by educational researchers, as it not only tests the consistency of findings obtained, reduces bias and facilitates validation of data through cross verification from more than one source but also deepens and widens the readers' understanding from different standpoints (Creswell & Clark, 2007). Furthermore, it allows for "the identification of the convergence and divergence of qualitative and quantitative data, contributing to results that mutually complement each other" (Santos et al., 2017, p. 8).

### Research Context and Participants

Data were collected from a total of 130 students (36% female, 64% male; 65% business majors, 35% engineering/science majors; 55% sophomores, 34% juniors, 11% seniors) enrolled in an undergraduate business communication and leadership course (two sections) via EMI at a science- and technology-oriented university located in an industrial metropolitan city in South Korea (hereafter, Korea). The international students (17%) were mostly from Central Asia (Kazakhstan, Uzbekistan, Kyrgyzstan, etc.). Approximately 82% of the students self-reported their English ability to be intermediate to advanced (based on their TOEIC reading and listening scores). Embracing the internationalization of education and research, all courses at this university are taught exclusively in English.

The course was augmented by an online SQA platform, Piazza, with the purpose of fostering asynchronous teacher-student and student–student interactions and simplifying collaborative learning processes. The reasons for selecting Piazza for this study included the following: 1) it has been efficiently used by millions of students and professors from Harvard, Stanford, etc.; 2) it connects students, instructors, and TAs to provide students with the support they need, even at 2 AM; and 3) it is free[1] (Piazza, 2022). Other popular platforms for online chatting and collaboration (Slack, Chanty, etc.) are paid services and are mostly used by businesses.

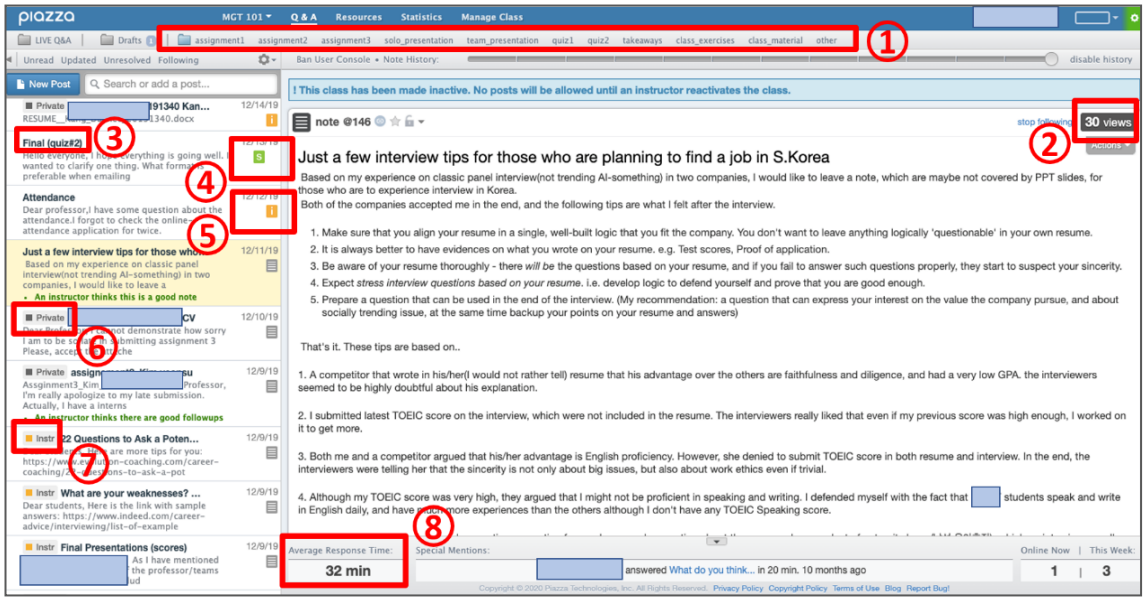
The instructor created a class on the Piazza website by specifying the university, the course name, the course start date, and other details (course description, syllabus, etc., and sent the class access link via BlackBoard to the students for a sign-up. During the first class, Piazza's features and how to use the platform were explained to the students. The students were also advised to download the Piazza app on their mobile phones so that they could receive real-time notifications of the posts/questions.

Among Piazza's useful features are anonymous posting, which encourages every student to participate; time of posting; grouping of information based on tags for easy searching; polling; post/question/comment endorsement by clicking "good comment" or "helpful!"; and average response time. The tool's interface consists of a sidebar listing inquiry/discussion topics and a larger pane with exchanges related to a specific post. Other features are depicted in Figure 1.

[1] Starting August 2021, Piazza moved to a paid model (an instructor, institution-wide, or department licence) in response to the COVID-19 outbreak and widespread adoption of online learning.






*Piazza Features:* 1. Customized folders; 2. Number of views; 3. Post made by a student; 4. Post answered by another student; 5. Post answered by the instructor; 6. Private post to the instructor (not visible to others); 7. Post made by the instructor; 8. Average response time.

*Figure 1.* A screenshot of a senior student's post sharing her job interview experience.

In the current study, various features of Piazza were used: class announcements, resources, key takeaways, exercises, discussion forums, Q&As and feedback on assignments (Figure 2).

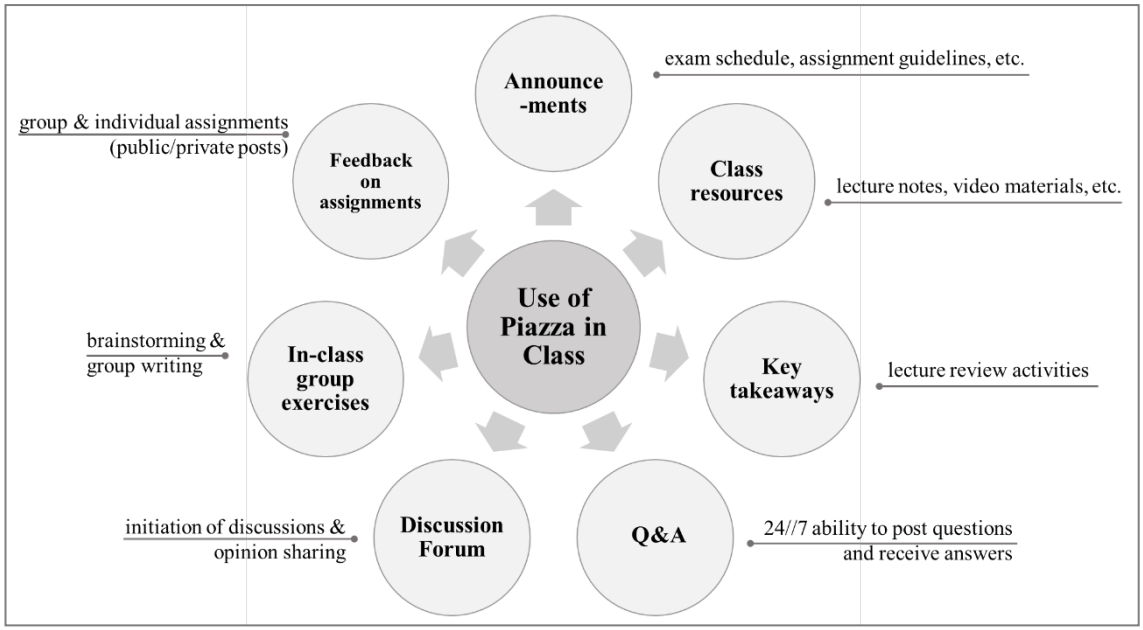



*Figure 2.* Use of Piazza in the business communication and leadership class.

In the discussion forum, the instructor usually posted a question, and the students expressed their opinions by commenting publicly or anonymously (Figure 3).

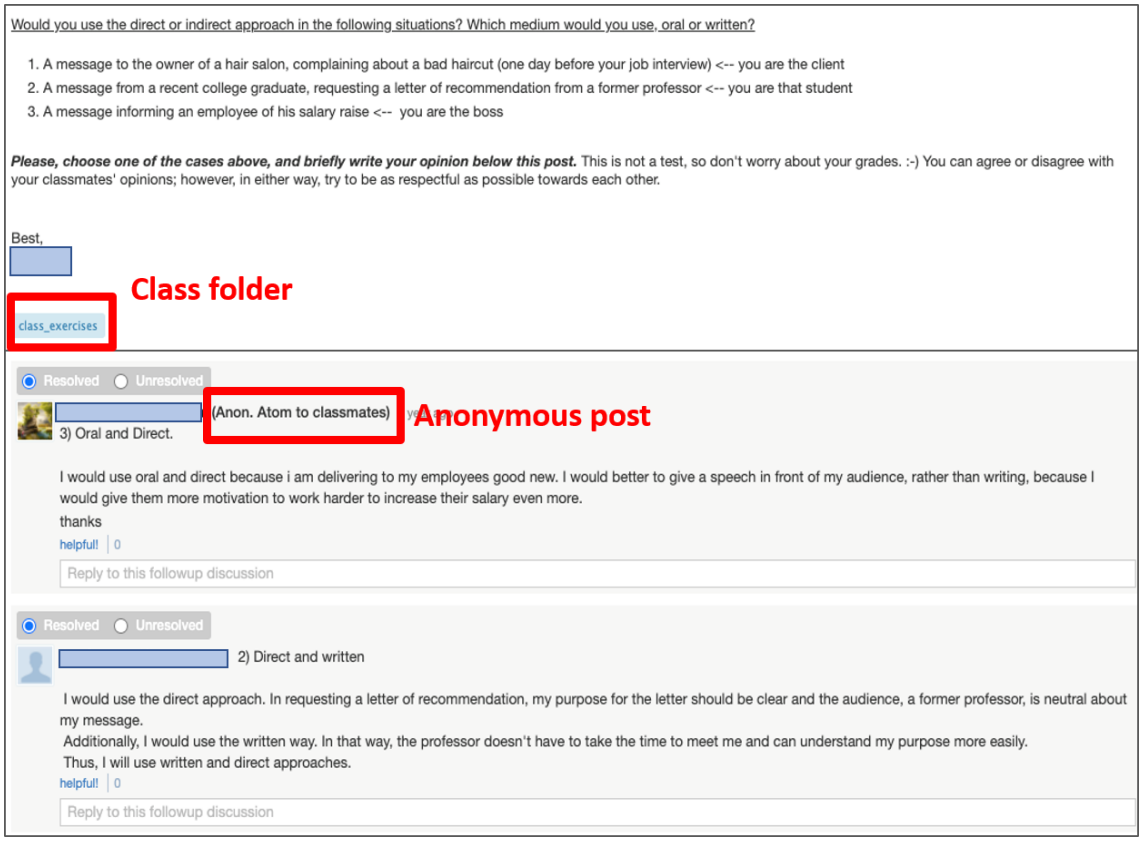



*Figure 3.* Screenshot of the instructor's public post and the students' answers.

Team assignments (e.g., business reports) were uploaded by the students to Piazza in public posts so that other teams could ask related questions and the instructor could provide her feedback. Individual assignments (e.g., business letters) were shared via private posts so that only the instructor could see them and give personalized feedback to each student (Figure 4). Feedback was guided by the business communication rubric that was designed to assess learners' business writing skills and that was provided to the students in advance.

## Research Instruments

The anonymous online survey was designed to collect both quantitative and qualitative information about students' perceptions of the teacher's TEFF on written assignments and their experiences with and attitudes towards an SQA platform within the context of the business course. The survey was composed of a variety of response formats, including a five-point rating scale from "strongly disagree" = 1 to "strongly agree" = 5, multiple choice options, checkboxes, and an open response. Prior to launching the main research project, to construct a robust questionnaire applicable to EMI students and establish reliability among the items, the instrument was pilot tested on two convenience samples (n = 51 and n = 65) of undergraduate students taking the same business communication and leadership course in earlier semesters. Furthermore, after consultation with three EMI instructors, 3 items of the *perceived effectiveness of the TEFF* scale were revised due to low reliability coefficients, and 2 ambiguous items were deleted. The third pilot (n = 80) yielded high internal consistency of the scale, as determined by a Cronbach's alpha reliability coefficient of .887. The results of the pilot study provided the basis for refinement of the instrument. The refined survey was administered to the students on the last day of the course at the end of the 16-week semester and took approximately 5-7 minutes to complete. To assess students' writing performance, pre- and post-TEFF intervention writing tests were used.

In addition to the open-ended questions included in the questionnaire, the answers from the



semistructured focus group interview were used for further exploration of the research questions. The focus-group interview technique was chosen for the current study, as several participants can express their true feelings, opinions, and perceptions about the subject at the same time, allowing the data to be gathered in a more systematic and integrated manner (Stewart & Shamdasani, 2014). Typically, semistructured interviews lead to focused, conversational researcher-participant communication, guided by a flexible interview protocol and supplemented with follow-up questions (Brown & Danaher, 2019). To assess students' writing performance, pre- and post-TEFF intervention writing tests were used.

## Data Collection

The data were collected within a 16-week academic semester. The classes met twice per week for 75 minutes each. As a part of their graded coursework, the students were required to write a business letter, which served as a pre-test measure to establish the baseline performance of all research participants. The instructor provided the students with individual, formative feedback focused on the letter's layout, content, structure, vocabulary, and language mechanics. Feedback delivered via Piazza included praise for good work and criticism for areas for improvement. Instead of specifying all errors, feedback was meant to indicate error patterns and guide students through the correction process. The students were able to act upon the feedback they received by asking further questions (Figure 4). Their questions were answered by the instructor in the same thread.

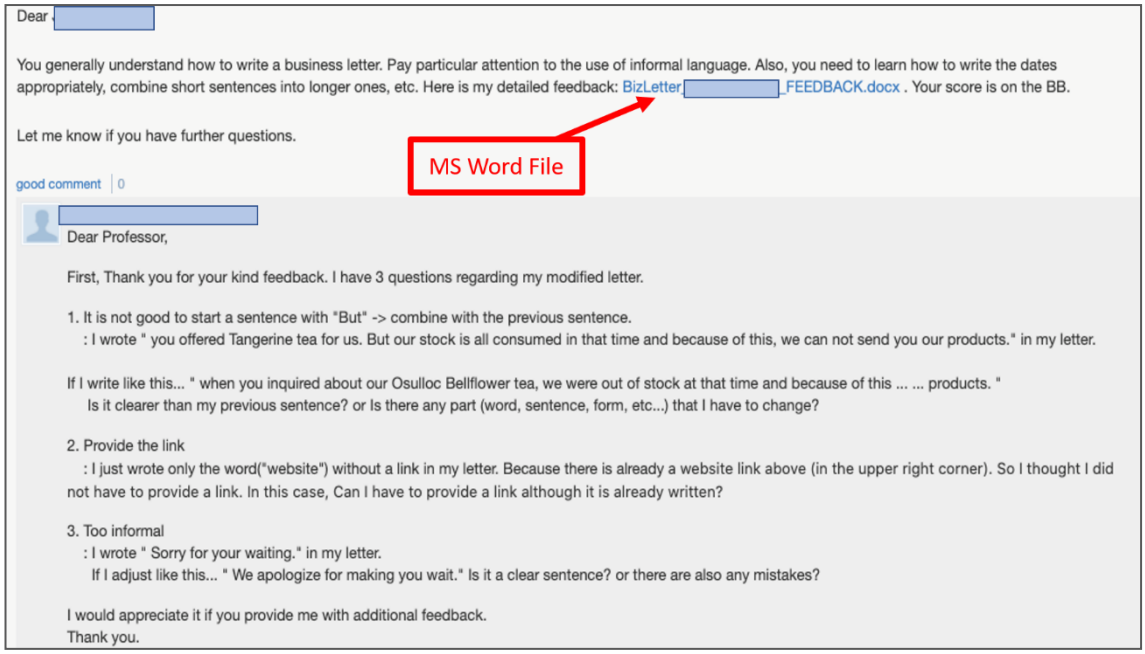



*Figure 4.* Screenshot of the instructor's private post (feedback) and the student's reply.

The post-test (another business letter) took place after an intensive four-week TEFF intervention. Both pre- and post-tests were evaluated by the external raters, who were two university professors (UK and Canada; master's degrees in English education; EFL teaching experience in Korean universities), using the same scoring rubric.

The focus group invitation was posted via Piazza during week 16, two days after completing the online survey, and eight students volunteered to participate. To reduce potential bias, the list of interviewees was cross-referenced with metadata from the Piazza website, which offers a student participation report by user type (frequent, moderate, passive) based on the total number of contributions (posts, responses, etc.) from individual students. All names were substituted with identification codes (Table 1). The interviews were scheduled at a place and time convenient for the participants.

TABLE 1
*Interviewees*

| Code | Gender | Nationality | Major | Year |
|---|---|---|---|---|
| B1 | Male | Korean | Business | Sophomore |
| B2 | Male | International | Business | Senior |
| B3 | Male | Korean | Business | Junior |
| B4 | Male | International | Business | Sophomore |
| B5 | Female | International | Business | Sophomore |
| B6 | Female | Korean | Business | Sophomore |
| E1 | Male | Korean | Engineering | Sophomore |
| E2 | Male | Korean | Engineering | Junior |

The interview questions were largely based on the online survey items to substantiate the answers and thoroughly address the research questions regarding students' perceptions of feedback delivered via the SQA platforms and the benefits and limitations of the platform regarding the learning content and language. By integrating the online survey and the interview, the research design allowed a more in-depth analysis of the students' perceptions of their EMI learning experiences within a technology-enhanced environment.

## Data Analyses

The primary objective of this study was to scrutinize the extent to which integrating an SQA platform into a business writing class would impact students' writing performance and study motivation in the EMI context. The quantitative data were analysed using IBM SPSS version 25. Descriptive statistics were generated for the Piazza user experience, the perceived benefits and drawbacks of the tool, and the *perceived effectiveness of the TEFF* scale. A paired-samples t test was conducted to determine whether there was a statistically significant difference between students' writing performance in terms of the content and language before and after the TEFF intervention. The significance level was set at $p \leq .05$. The interrater agreement was assessed by means of the intraclass correlation coefficient (ICC), which is a widely used reliability index in test-retest, inter- and intrarater reliability analyses (Koo & Li, 2016). A high degree of reliability was found between the two raters who evaluated the pre- and post-tests (.925 and .877, respectively).

The qualitative data were coded by one author/researcher using MaxQDA 2020 software (open coding, axial coding and selective coding) and then checked by the other. The quantitative and qualitative methods complemented each other in valuable ways and were used in various constellations throughout the current study.

# Results and Discussion

## Perceived Affordances and Limitations of the SQA Tool

The first research question addressed learners' perceptions of the affordances and limitations of the use of the SQA tool in the EMI course. First, when asked about their prior experience using Piazza, 100% of the survey respondents reported that they were using the platform for the first time in the course. Over 80% of the participants claimed that they were active or moderate Piazza users, while less than 20% reported being only active listeners/readers on Piazza (Figure 5).



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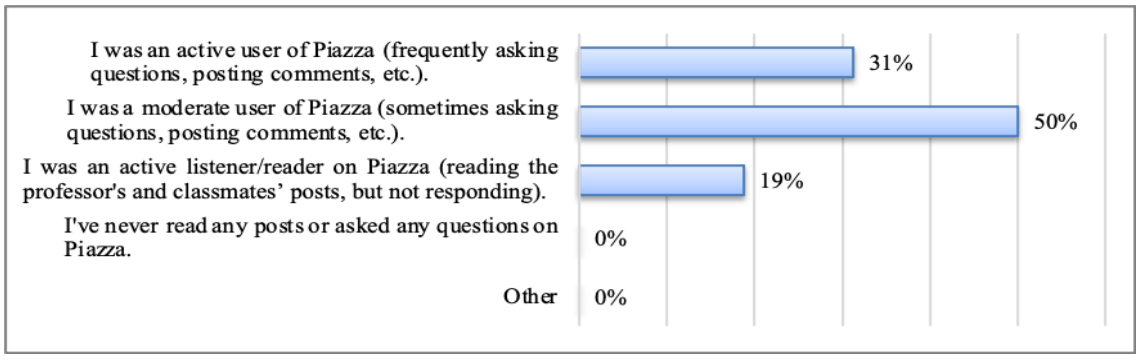


*Figure 5.* Piazza user experience by the extent of use.

Interestingly, no student (0%) was completely unengaged in Piazza activities. The findings are in line with student-use statistics, which were independent of the survey data and available on the Piazza class site at the end of the semester. According to Piazza metadata[2], students were online on 51 days, on average, during a 3.5-month-long semester, and there were a total of 2023 learner-made contributions in both sections, which included 394 posts (a question or a note), 110 responses, 812 follow-ups and 707 replies to follow-ups. According to the metadata, students were particularly active in follow-ups and replies to follow-ups. Moreover, the number of questions, answers and follow-ups tended to spike during the pre-exam and assignment weeks.

As shown in Figure 6, the students utilized Piazza in various ways. They most valued the opportunity to receive TEFF on assignments via private and public posts (94%) and communicate with the professor/classmates at any time of day (85%). These findings supported the outcomes concerning the perceived effectiveness of TEFF from the survey and the interviews, which are described in detail in the next subsection. Moreover, the participants appreciated doing in-class exercises and the immediacy of accessing course-related information and receiving answers to their questions, which helped them reinforce important concepts taught in class lectures. These findings are noteworthy contributions to the literature.

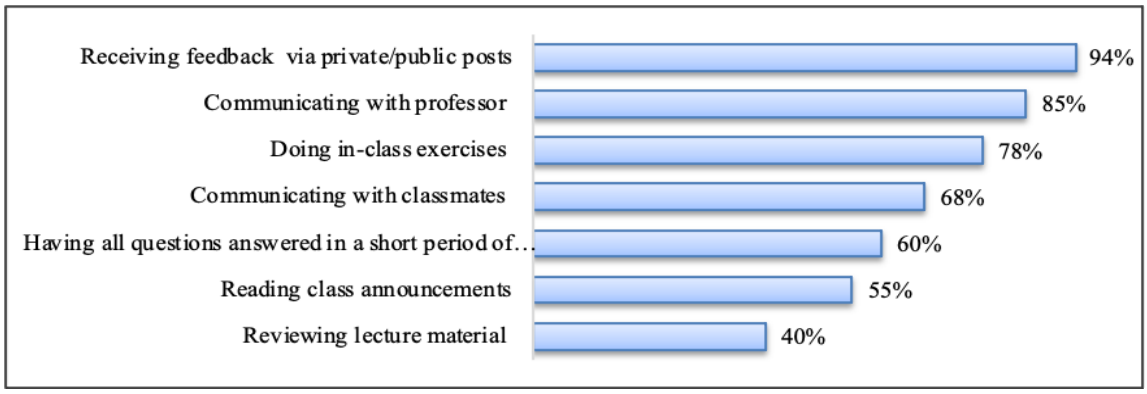


*Figure 6.* Perceived benefits of Piazza.

Additionally, the survey included an open-response item to determine what students disliked about Piazza. Forty percent of the participants reported their *concern that everybody could see the student's grammar mistakes,* which was one of the reasons for being a passive user. This finding aligned with those of other studies, in which Korean students expressed their constant anxiety about their grammar errors in writing and speech, as they perceived good English proficiency to be critical to their academic success (Jeong, 2016; Kim et al., 2017). Another aspect was Piazza's *inconvenient user interface* (30%), which required some time for the students to become accustomed to. The participants also felt annoyed with *too*

[2] The data from the instructor's use of Piazza were excluded.

*many email notifications* (18%), as they received an email every time their peers made a post or answered a question in Piazza. The majority of interviewees confirmed that disadvantage. For instance, B5 complained that she disliked when every single message was automatically sent to her university email account, and B2 claimed that "sometimes, email notifications can be very irritating because, for example, if the asker in the discussion simply thanked the answerer". Other comments (12%) referred to the *inconvenience of using both BlackBoard and Piazza* in class and occasional frustration with some students *"going off topic"*.

## Impact of TEFF on Learners' Performance

The second research question examined the effects of formative feedback delivered via the SQA platform on learners' writing content and language learning.

### Quantitative data findings

A paired-samples *t* test revealed that there was a statistically significant difference in the scores for the pre-test ($M$ = 11.33, $SD$ = 1.37) and post-test ($M$ = 15.10, $SD$ = 1.31) conditions; $t(129) = -29.366$, $p = .000$ (Table 2).

TABLE 2
*Paired-Samples T Test*

| | *M* | *SD* | Std. Error Mean | 95% Confidence Interval of the Difference | | *t* | *df* | *p* |
|---|---|---|---|---|---|---|---|---|
| | | | | Lower | Upper | | | |
| Pre-test - Post-test | -3.7625 | 1.146 | 0.1281 | -4.0175 | -3.5075 | -29.366 | 129 | .000 |

*Note.* $p < .05$

These results suggest that TEFF significantly improved students' writing performance. The t test outcomes were supported by the survey findings, which revealed that the students appreciated the instructive qualities of the TEFF and considered it to be a good scaffolding tool for learning and motivation in the EMI classroom. The mean scores for the perceived *effectiveness of the TEFF* scale from the learners' perspective are presented in Table 3. The scale had high internal consistency, as indicated by a Cronbach's alpha reliability coefficient of .865.

TABLE 3
*Perceived Effectiveness of TEFF*

| Statement | *M* | *SD* |
|---|---|---|
| Professor provided sufficient amount of TEFF on my written assignments. | 4.59 | .538 |
| TEFF was useful/effective in learning the business communication subject. | 4.46 | .586 |
| TEFF helped me improve my business communication skills. | 4.41 | .593 |
| TEFF helped me improve my English language skills. | 4.30 | .631 |
| TEFF helped me gain more confidence in business writing. | 4.20 | .640 |
| TEFF has motivated me to perform better next time. | 4.36 | .584 |
| I utilized TEFF to improve my performance in future assignments. | 4.32 | .671 |

*Note.* 5-point Likert scale: strongly disagree (1) - strongly agree (5)

Remarkably, no students disagreed or strongly disagreed with the survey statements, which implies that the TEFF was positively received by the learners. The outcomes indicated that the learners considered TEFF particularly beneficial in terms of its *sufficiency* ($M$ = 4.59, $SD$ = .538) and *effectiveness in learning a business subject* ($M$ = 4.46, $SD$ = .586) to a slightly greater extent in content learning ($M$ = 4.41, $SD$ = .593) than in language learning ($M$ = 4.30, $SD$ = .631).

The results observed in this study mirror those of previous studies that examined the value of TEFF in

various modes and contexts (e.g., Kim, 2018; Odo, 2021) and make a substantial contribution to understanding the role of this type of feedback in helping students improve their understanding and performance in challenging EMI settings. Since the simultaneous acquisition of both English language skills and knowledge of subject matter is considered to be the ultimate goal of an EMI class (Dearden, 2015; Macaro, 2018), this study makes a meaningful contribution to EMI research in terms of pedagogical practices.

## Qualitative data findings

The qualitative data analysis revealed four overarching subthemes related to TEFF: *perceived effectiveness of TEFF* (in terms of content and language)*, motivation and reflective learning, immediacy* and *interactive communication.*

***Perceived effectiveness of TEFF.*** Data from the interviews were basically in agreement with the quantitative results and allowed a deeper exploration of the perceived effectiveness of the TEFF. When asked what they thought about the TEFF provided via public and private posts on Piazza, the interviewees noted that it was helpful in conveying how to enhance their business writing skills regarding both content and language. For instance, B4 claimed that "although it is not easy to study academic subjects 100% in English", Piazza and TEFF were helpful for understanding business communication concepts and improving his English writing skills. B6 reported that she substantially enhanced her business writing skills through the process of posting questions/answers and receiving TEFF. According to B2, "this course was a superb mix of theoretical and practical content supported by the Piazza platform and its various useful features", and he "received much more practical advice/feedback than in other courses". Additionally, one engineering student commented as follows:

> *Before taking this course, as an engineering student, I had few opportunities to think in depth about how to write using business language, how to communicate well … With the help of the professor's feedback delivered via Piazza and my active engagement in Piazza class activities, I was able to improve my business writing performance and even notice the mistakes made by my classmates.* (E2)

The interview findings show that TEFF was considered by the students to be effective in relation to their understanding of subject matter, knowledge, and the discourse of the discipline as factors boosting their learning performance.

***Motivation and reflective learning.*** Table 3 demonstrates that the students acted upon the feedback they received ($M$ = 4.32, $SD$ = .671) via Piazza. Furthermore, TEFF had a positive impact on learners' confidence ($M$ = 4.20, $SD$ = .640) and motivation ($M$ = 4.36, $SD$ = .584), suggesting that implementing TEFF has the potential to become a practical solution for the issue of disengaged and demotivated students mentioned in previous studies (e.g., Boud & Molloy, 2013; Winstone et al., 2017). These findings were supported by the following statements from the interview:

> *By receiving not only negative feedback, I also found my strong sides. By trying to implement the professor's advice, I felt way more confident and tried to apply all feedback in my further assignments.* (B2)

> *It was nice to be able to see right away what I was doing wrong via Piazza. This allowed me to immediately correct my mistakes and ask the professor for more feedback, which made me study harder.* (B1)



 

> *It motivated me to study harder when I received detailed feedback via Piazza. I could also go back and re-read feedback every time I needed it. I actually used my new knowledge in future assignments and became more confident in business writing.* (B6)

> *Receiving TEFF was my favourite part of Piazza, as it was quite fresh, engaging and giving courage to students. Thanks to TEFF, I was able to apply my content and language knowledge in various activities and even give tips to my friends who didn't take this course.* (E1)

As mentioned in the literature review, even though feedback may accurately correct errors, it still might not lead to a change in subsequent assignments, which raises concerns about the impact of feedback on future learning (Gibbs & Simpson, 2005; Winstone et al., 2017). Notably, the students experienced reflective learning (Dewey, 1933; Odo, 2021; Schön, 1983), which involves actively monitoring, assessing, and improving their knowledge, abilities, and performance during their own learning process. The interview results clearly underscore the value of TEFF on written assignments as a means of prompting reflection on the work done since the TEFF was received, attended to, and acted upon, and TEFF even served as a motivator to study harder.

***Immediacy and 24/7 access***. Despite the asynchronous nature of the TEFF in this study, the students appreciated its flexibility in a broader sense and *immediacy* and *lack of time/space constraints*, in particular:

> *Most exams require me to send an e-mail directly to the professor, set the time and visit the office to see what's wrong with my work and get feedback, but the professor's immediate and frequent feedback via Piazza could skip all of this hassle. Also, it was most useful to be able to ask additional questions to the professor at any time without space and time constraints.* (B1)

> *It was useful because I could just see my feedback anytime. In other courses, [professors] just distribute the test papers and collect them back, which gives us less time to read feedback, if any. I liked that feature of Piazza, to see your feedback any time, ask a question, correct mistakes, and improve your writing.* (B4)

> *We live in a century where we have to move rapidly. Hence, even for university courses, we want to get immediate answers. That's why Piazza was a great discovery for me. I liked that I could ask a question in my dorm or in a coffee shop.* (B2)

This result is consistent with those of previous studies (e.g., Kokoç, 2019; Soffer et al., 2019), which claim that in the context of online learning, greater perceived flexibility could result in greater behavioural engagement and improved academic performance. Notably, the comments from B5 suggested that students benefited from the collective knowledge of their classmates and the instructor, which is one of the important features of the SQA tool:

> *The part I liked the most about Piazza is that the questions I asked were immediately answered by the professor and classmates. The point is that not only can I clarify and learn, but my classmates can as well.* (B5)

The above comments accentuate the significant scaffolding role of TEFF, considering that for feedback to support learning and positively influence student performance, it should be delivered frequently and in a timely manner so that students receive it while it is still relevant (Carless & Winstone, 2020; Gibbs & Simpson, 2005). Furthermore, B6 pointed out that the professor's "immediate feedback was useful, helpful and more emotionally comfortable than an email". These interesting comments corroborate the



 

findings reported by Carless and Winstone (2020) that feedback-literate students "appreciate the value of feedback" and "work with emotions productively" (p.7).

***Interactive communication.*** The last perceived benefit that emerged from the data was *interactive communication.* Although previous studies highlighted the effectiveness of some types of asynchronous TEFF (e.g., audio or screencast feedback), they also acknowledged its limitations, i.e., that teacher-student interaction is not reciprocal and that there are no opportunities to ask questions about the feedback and receive an immediate answer (Kim, 2018). The results of this study go beyond previous studies by demonstrating the change in students' mindsets through the enhanced interactive class environment enabled by the SQA tool, as exemplified by the following interview segments:

> *I think other courses have fewer opportunities for students to talk interactively about their assignments with professors. However, with our use of Piazza, interactive discussions with the professor were possible. Also, I actually asked the professor additional questions while using Piazza and addressed the issues with my assignment.* (E2)

> *The ability to communicate directly with classmates and the professor was good. I think it was better than the function itself to change the mindset of the students. The more I got used to Piazza, the more attractive it became thanks to its two-way communication function.* (B1)

> *At first, I was not familiar with communication between the professor and friends, so I was not active in Piazza. However, I could see active questions and answers/feedback from classmates and the professor in real time, and it led me to become active as well.* (B6)

Furthermore, B5 felt encouraged by her classmates' messages praising her work and was able to make more friends:

> *Actually, Piazza really helped me a lot while I was posting my assignments. When you do a good job, many classmates write warm, cute messages that make you feel happy and motivated. I think it was a good way to become closer with my classmates and keep in touch with them even after completing the course.* (B5)

Another interviewee (E2) made an intriguing statement by comparing his communication with professors via Piazza and other social media. Although he became "friends" with many of his school professors on Facebook, he rarely communicated much with them through that platform except for simple greetings and "never shared opinions and talked deeply". He admitted that this was the first time he actively interacted with a professor "using a platform like Piazza optimized for communicating on certain topics".

According to Carless (2020), dialogic feedback has the potential to be more efficient and develop an interactive class environment. Overall, the interactive feedback between teachers and students is viewed as more effective for learners, as it can resolve ambiguities and encourage writers with particular cultural and writing needs to develop both more well-written texts and their writing abilities (Hyland, 2013).

***Other benefits of TEFF.*** Remarkably, the interviewees liked the *constructive nature* of the feedback, which did not make them feel discouraged or disappointed. Examples of such comments are as follows:

> *When you do assignments and get a grade (doesn't matter if it's good or bad), you don't know why. If you get a good grade, you will just be happy and think that you understood the material very well. When you get a bad score, you don't know what you did wrong. How can you improve? One of the*



 

*most useful things in the business communication course was the professor's constructive feedback. I clearly understood what I did right and what I should improve.* (B5)

*I love the professor's feedback style (a combination of positive and constructive comments). It doesn't make us feel bad.* (E1)

Teacher comments written in a tone that is too negative and critical can distress and demotivate learners; therefore, educators need to ensure that their feedback is balanced with both positive and negative feedback comments (Robinson et al., 2013). This finding could be another invaluable contribution to the EMI literature on instructional strategies used for motivating struggling or reluctant learners.

## Conclusion

The present study makes several meaningful contributions to our understanding of the role of TEFF in improving learning outcomes, especially in EMI settings. Most studies on teachers' feedback appear to have been conducted in the English-as-a-foreign-language context and not in the EMI context. Therefore, there is a scarcity of research providing effective and practical advice for EMI educators to improve the quality of their courses and motivate their learners (Kim, 2017). The findings showed that the research participants performed significantly better on their post-tests than on their pre-tests, underscoring the value of the TEFF intervention in prompting the reflective learning process and enhancing writing performance. Both the quantitative and qualitative results revealed that the students valued TEFF in their written work for its immediacy, constructiveness, and ability to facilitate interactive communication; furthermore, the students believed it helped them improve their business writing skills in the challenging EMI environment. Moreover, the study outcomes provided ample evidence in support of Piazza's effectiveness as a collaborative multipurpose platform. Specifically, digital technology can contribute to the evolution and improvement of teachers' ability to provide formative feedback in content-based language education. These findings contribute to the academic literature in this underexamined domain.

Furthermore, this study can serve as a reference for university EMI instructors by providing insights into how to improve their own reflective practices and teaching methodologies for content-area writing with the help of an SQA platform and therefore enhance students' performance in and satisfaction with EMI courses. Teacher change, defined as "a process of continual intellectual, experiential, and attitudinal growth of teachers" (Lange, 1990, p. 250), leads to changes in classroom practices, which, in turn, can result in not only more rigorous student learning but also teachers' personal development and more optimistic career perspectives (Dafouz, 2018; Yang, 2018).

## Limitations and Future Research

Several potential limitations should be considered. The research was conducted in one course in one undergraduate business program at a single science-oriented university where EMI is compulsory. Therefore, it is recommended that replication studies undertake comparative analysis in their respective contexts. Although the sample was relatively small (130 students), the study was reinforced by the rigor of the mixed-methods design adopted to complement the breadth of understanding provided by the quantitative methods with the depth of understanding afforded by the qualitative methods.

Further work should concentrate on the use of larger samples across various disciplines, not only business fields. In addition, future research should continue to examine students' specific preferences for the various feedback modes (e.g., written, audio, audio-visual) depending on the task, language proficiency and their individual perspective on feedback type (e.g., grammar, content, or both). Last, considerably more research work will need to be done to determine specific motivational factors related to learning in the digital environment in the EMI context.



 

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