Online Collaboration Tools and International Students' Sense of Belonging in Group Work

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Abstract: Group work has been widely used as a pedagogical practice in higher education institutions in the United States. Nevertheless, few studies have looked into the processes of collaboration for group work involving international students who speak English as a second language. This population of students, which is increasing at my university, is usually at a disadvantage linguistically and culturally compared to their American peers in group work, which might pose challenges in their communication and interactions with group mates and lead to a lack of a sense of belonging in the group and also in the class. Part of a larger research project on international students' learning experience with group work, this study focuses on three international students' experiences using online collaboration tools for group work. Pedagogical implications for using online collaboration tools in group work to enhance international students' learning and sense of belonging are discussed.
Keywords: international students, group work, online collaboration tools, sense of belonging

Group work has been widely used as a pedagogical practice in higher education institutions in the United States. Especially in business schools, group work has become an important component of curricula and instruction to "help students learn through interaction with others as well as to become accustomed to working in a group environment that emulates the work place" (Yang, 2014, p. 74). Research has also shown that employers value the ability to contribute and manage group projects in new graduates (Storch, 2017). Yet using group work as a pedagogical tool also has potential problems. For instance, a lack of sense of belonging among students can pose significant challenges in group work. When students do not feel a strong connection or identification with their group, it can hinder effective collaboration and the overall success of the project (Trujillo & Tanner, 2014). For institutions with increasing numbers of international students who speak English as a second language (L2 students), the possibility that group work may cause friction among different linguistic and cultural groups is an additional cause for concern. As Ledwith and Lee (1998) emphasized, "the issues of mixing different cultures and of English language ability" is prominent in the tensions caused by group work (p. 103).

One of the greatest challenges that international students face when studying in higher education institutions is the lack of linguistic and cultural knowledge for meaningful interaction with faculty and peer students (Zou, 1998). Many of them are uncomfortable about participating in class discussion and are afraid of exposing their lack of familiarity with both social conventions and the necessary linguistics skills. Nonetheless, a survey of over 2,000 students from eight Asian countries revealed that international students:

> Do not, in fact, wish to be spoon-fed with facts from an all-knowing "fount of knowledge." They want to explore knowledge themselves and find their own answers. Most of all, they want to do this together with their fellow students in an atmosphere which is friendly and supportive. (Littlewood, 2000, p. 34)

Various online collaboration tools (e.g., Google Docs, Microsoft Teams, Canvas Group, etc.) have been proved to increase collaborators' productivity and efficiency (e.g., Chu et al., 2009; J. Li & Mak, 2022; Orellana, 2017). The asynchronous and text-based features of such tools can also make

communication easier and more comfortable for international students who are not confident in their language skills. Still, insufficient attention has been given to how technology use supports international students in navigating linguistic and cultural differences, facilitates effective communication with their group mates, and ultimately enables them to gain a strong sense of belonging in group work and learn from the collaboration experience. This study fills this research gap by examining the ways that international students use online collaboration tools to interact with group mates and develop a sense of connectedness as well as community, which positively impacts their overall learning experience in the class.

Literature Review

Group work, on the face of it, will facilitate greater interaction and collaboration between students regardless of linguistic and cultural differences, but this is not always the case. International students are likely to be excluded from groups if their language abilities are judged insufficient (Ledwith & Lee, 1998). Most of the time, it is not easy for them to be accepted by other students who speak English as their first language (L1 students) regardless of whether the groups are formed by instructors or self-selected (Verbitsky, 1998). Even if the international students are capable and motivated, a lack of mastery of academic English may interfere with their ability to contribute to the group, which forces them to become unwilling free riders and "puts in question the legitimacy of the use of group work" to assess students' learning (Morris & Hayes, 1996, p. 231).

For group work involving international students, there are more issues that deserve instructors' attention. For instance, language proficiency might hold these students back from participating in group discussions, and their contributions are sometimes not valued by the L1 group members, both of which will be detrimental to international students' self-esteem. This increasing population of students is usually at a disadvantage linguistically and culturally compared to their American peers in group work, which might affect their communication and interaction with group mates and lead to a lack of a sense of belonging in the group as well as in the class. Leki (2007) and Yang (2014) found that group work requiring L2 students to collaborate with L1 students might pose challenges to the L2 students because they often defer to their L1 group members and contribute much less to group tasks. Patterns of authoritative/responsive and dominant/passive peer interaction may also discourage international students from voicing their thinking (Storch, 2002; M. Li & Zhu, 2013).

In particular, international students might have negative experiences of working in multilingual and multicultural groups if the L1 group members focus on completing the task with efficiency, positioning them as incompetents and ignoring their suggestions on the group project (Leki, 2001). Oftentimes, face-to-face communication can pose more challenges to international students for various reasons. They might be unconfident about their oral English competency or feel reluctant to speak up because of cultural differences. More importantly, international students usually need more time to process language—both the input (what they hear) and the output (what they want to say)—in discussions because they are switching between two languages (their L1 and L2) during the thinking process. Nevertheless, most L1 English-speaking students are not aware of the special needs (e.g., patience) that their international group mates might have and unconsciously exclude them from discussions.

That being said, asynchronous and text-based features of online collaboration tools (e.g., Google Docs, Microsoft Teams, Canvas Collaborations, etc.) can help international student process the language input and output more easily and alleviate the embarrassment they may feel when unable to produce immediate responses to group mates because of linguistic barriers. For low- or intermediate-proficiency international students, group tasks can also be good opportunities for language learning, but only if there is support in the process of putting their ideas in the target language

(Swain, 2010). Research has indicated that online collaboration tools provide a range of benefits. First, they enable asynchronous collaboration, allowing students to work together effectively without the need for simultaneous communication. This inclusivity is crucial for international students who may need more time to respond (Poupore, 2016). Second, online platforms offer a shared workspace, permitting students to collectively edit and contribute to documents in real time. This not only encourages active participation but also cultivates a sense of shared responsibility, fostering a collaborative learning environment (M. Li, 2018). Additionally, these tools maintain a transparent record of contributions, which proves valuable for assessing individual participation in group projects (McKenna et al., 2022). Overall, leveraging these online collaboration tools aligns with best practices in promoting inclusivity and effective group work, especially for diverse student groups (Meeuwisse et al., 2010).

This study examined the ways that international students interact with group mates using online collaboration tools, aiming to address the following research questions: (1) To what extent does the implementation of online collaboration tools enhance international students' participation, interaction, and collaboration in group work? (2) How does this influence their overall sense of belonging in the learning community?

Method

To draw a clear picture of how international students use online collaboration tools in group work and how it impacts their sense of belonging, I relied on a qualitative design and conducted a study in a real setting of learning. Part of a larger research project on international students' learning experience with group work, this study focused on three international students' experiences using online collaboration tools for group work. Creswell (2007) claimed that qualitative research can be a powerful tool to study "research problems inquiring into the meaning individuals or groups ascribe to social or human problems" (p. 37); it thus is a suitable methodology for this study with the objective to better understand the educational practices and experiences of international students in group work.

Several features characterize qualitative research, including an emergent design, researchers' role as a key instrument, multiple sources of data, and a focus on participants' meanings, which all contribute to a holistic account of a complex problem (Merriam, 2009). Specifically, I conducted case studies of individual international students' learning from group work in a business writing course. Since the research questions are contextually specific and address contemporary issues, they comply with the conditions of choosing a case study method (Yin, 2009). In addition, case study research can also be used to understand a larger population of similar units (Gerring, 2007), which enables this study to generate insights for more classes involving international students.

This research was conducted in a business writing course at a research university of approximately 40,000 students in the Midwest region of the United States, 12% of whom are international students. The university has a long tradition of enrolling international students, with many classes including members of this linguistically and culturally diverse student population. The course includes a case project in which students form groups to discuss the business problems they identify in the case and collaboratively write a proposal and final recommendation report to address those problems. Typically, the group proposal is the first collaborative writing task in this course, so more instructions are provided throughout the process to ensure the success of students' collaboration.

For this study, I designed a series of scaffolding activities and tasks guiding students to use online tools for collaboration and to prepare them to transition from individual work to group work (see Figure 1). The process started with students writing a case analysis individually. They then participated in group work including collaborative peer review and group discussions (both synchronously in class and asynchronously online) to create a group proposal before working on the

recommendation report. Primarily, the collaboration tools the instructor chose for the class were the collaborative document platform and discussion board embedded in Canvas (a learning management system used by the university), as they are accessible to all the students. More specifically, the scaffolding activities and tasks included (1) assigning an individual case analysis in which each student documented their individual research based on the case prompt and wrote down their initial thoughts on the business problems they identified in the case; (2) using the collaborative document platform embedded in Canvas for group peer review of the individual case analysis and then having students meet in person to debrief the peer review; (3) creating group discussion boards on Canvas for each student to post their reflections on the individual case analysis as well as their ideas/thoughts for the group proposal before the groups met in person to plan for the proposal; and (4) asking each group to submit an outline for their group proposal based on their online and in-person discussions. (5) Then every student was assigned by their group to write 1 or 2 paragraphs for the group proposal and review each other's paragraph(s), again using the collaborative document platform embedded in Canvas. (6) After completing the collaborative peer review of group proposal, each group was required to submit a plan for revision before they submitted the final product of their group proposal for a grade.
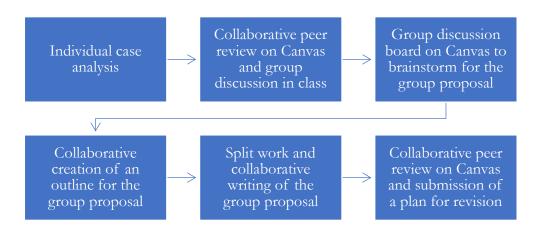

Figure 1. A series of scaffolding activities and tasks guiding students to use online tools for collaboration.

Students' posts on the group discussion board and all their written work on the collaborative documents (including their comments on peers' writing) were collected and analyzed. Upon completion of the case project, every student was asked to write a reflective essay on their group work experience and what they learned from the experience. One of the questions they needed to address in the essay was about the use of online collaboration tools and how it affected their group work. When the semester ended and final grades were posted, all the international students in the course were invited to a focus group interview to discuss their experience with the online collaboration tools used in the class and the factors that impacted their sense of belonging and learning in group work. The interview questions used in the focus group can be found in Appendix 1. Among all those who voluntarily participated in the interview, three international students—John, Cathy, and Sam (pseudonyms picked by themselves and used for privacy purposes)—were selected as the focal participants of this research and subjects of the case study. They are from different countries and

learned English as a second language in their home country. Although the participants were all business majors, their previous educational background before college and English proficiency varied. Table 1 provides a profile of each participant.

Table 1. Profiles of the three participants.

Participant	Nationality and transnational experience	First language	Major and minor studies at college	Educational background before college
John	South Korean; arrived in the U.S. at the age of 18 for college	Korean	Major in accounting and minor in technology management	Graduated from a private high school in South Korea
Cathy	Chinese; arrived in the U.S. at the age of 19 for college	Chinese	Major in finance and minor in business analytics	Graduated from a public high school in China and had studied in a Chinese University for 1 year before transferring to the university in the U.S.
Sam	Vietnamese; arrived in the U.S. at the age of 18 for college	Vietnamese	Major in finance and minor in entrepreneurship	Graduated from an international high school in Vietnam

Note. John, Cathy, and Sam are pseudonyms.

The primary analytical approach involved constant comparison of distinct data sources and types across cases. This analytical process can be divided into three distinct stages. First, the process commenced with open coding, wherein concepts from the text—interview transcripts and written reflections—were categorized and labeled as codes or subcodes. This inductive and iterative process involved extracting, interpreting, and defining codes and subcodes from the participants' own expressions. Subsequently, I systematically contrasted and compared these codes, leading to the identification of thematic patterns. The coding process culminated in selective coding—where codes were refined into a provisional framework for findings. Appendix 2 provides a sample of categorized themes and codes across cases.

Findings and Discussion

Sense of belonging is a fundamental aspect of learning, particularly for international students who might encounter linguistic or cultural barriers in group work or in class (Meeuwisse et al., 2010). When students feel connected to their learning community and valued as participants, it can significantly enhance their motivation, engagement, and overall learning outcomes. This study found that online collaboration tools can foster a sense of belonging through group discussion boards and collaborative peer review. The benefits of using a group discussion board on Canvas and doing peer review on collaborative document platforms are the two most salient themes that emerged from students' reflective essays regarding their group work experience and use of online collaboration tools. Data obtained from the focus group interviews with the international students substantiated the positive effects that the utilization of these tools can have on students' learning. Additionally, the data revealed how the online discussion board and peer review facilitated through collaborative documents can

augment international students' sense of belonging by fostering inclusivity and a shared learning experience. The asynchronous functionality of these online collaboration tools gave international students ample time to prepare their contributions, thereby enhancing their confidence in actively engaging in group work.

Group Discussion Board—Build a Learning Community

Online discussion boards provide a virtual space for students to collaborate with their peers in group work activities. This tool enables students to engage in discussions, share ideas, and work collectively toward common goals. Collaborative activities on discussion boards can also foster a sense of belonging as students realize they are part of a collaborative community, working together to achieve academic success (Zengilowski et al., 2023).

Particularly, online discussion boards offer international students an inclusive environment that ensures equal participation in group work. Unlike face-to-face discussions where certain students may dominate the conversation, online discussion boards provide an opportunity for all students to contribute their ideas and perspectives. This inclusivity is especially important for international students as they feel valued, respected, and recognized for their contributions. When every student has a voice and the opportunity to actively engage with their peers, a sense of community and belonging is fostered. As John said in the interview:

> I know I have an accent, so I am reluctant speaking up in the group discussion. The discussion board on Canvas was helpful when we were planning for the group proposal. I feel more comfortable writing down my ideas first and sharing with my teammates without being embarrassed about my accent. The online discussion board also helped me better prepare for the later face-to-face discussions, because I was given time to read through my teammates posts and think about my response…. If we jump to face-to-face discussion immediately, I might not fully understand their ideas when they speak fast and thus not be able to respond to or discuss with them.

John's sentiment also indicated that online discussion boards facilitate rich and meaningful interactions among all students in group work (Woo & Reeves, 2007). Through written communication, international students have more time to reflect on their thoughts and articulate their ideas more effectively. This medium allows them to provide more thoughtful responses, ask questions, and engage in in-depth discussions. John also said:

> After reading my posts, my teammates also seemed interested in my ideas and they asked me questions in the face-to-face discussion, which made me feel good about myself because I was contributing, and their questions prompted me to refine my ideas…. In my other classes, my ideas do not seem to matter because I don't talk a lot and no one really asks what I think.

By actively engaging in ongoing discussions and reflecting on their own growth, international students develop a stronger sense of belonging as they witness their progress and contributions within the group dynamic. Furthermore, online discussion boards provide international students with a platform for continuous learning and reflection within the context of group work (McKenna et al., 2022). Students can review and reflect on previous discussions, revisit their own contributions, and learn from the ideas shared by their peers. This reflective process encourages metacognitive awareness and enhances the learning experience, which can be seen from Sam's case:

We used the discussion boards outside of classroom as well. After posting our initials thoughts and individual ideas on the case, my group mates also shared resources on the discussion board and we had some informal discussions afterwards (to review or update our ideas and plan for the case project). This helped us develop bonds and trust as I felt a genuine investment in each other success.

Sam was a quiet student in the class. Similar to John, he did not seem confident in his oral English and often sat by himself to avoid interacting with classmates. However, the online discussion board contributed to the development of a robust learning community and created opportunities for him to offer and receive support during group work activities. Moreover, the asynchronous nature of online discussions provides flexibility, allowing students to participate at their own pace (Zha et al., 2006). These interactions promote intellectual exchange, critical thinking, and collaboration, contributing to a sense of belonging as international students engage in meaningful academic discourse with their peers.

Collaborative Peer Review—Shared Responsibility and Learning Experience

Peer review is another effective method for fostering a sense of belonging in group work, especially if it is facilitated by online collaboration tools. For international students, collaborative peer review on digital platforms creates opportunities for them to engage in meaningful conversations with their peers regarding their jointly owned written work. The online collaboration tool embedded in Canvas or other collaborative document platforms such as Google Docs or Microsoft Teams allows students to work together synchronously or asynchronously, contributing to a shared product. This collaborative process also encourages cooperation and a sense of shared responsibility (Marshall et al., 2012). As Sam shared in the interview:

I like the way we did peer review in this class because all group members' work was on the collaborative document. I could see how my peers wrote and how they commented on my as well as others' work. Because it was a collaborative document and we all knew that whatever we did on the document was for the whole group, everyone took it seriously as no one wants to look like a slacker. I can say that most of the comments I received were helpful and I learned a lot from my peers.

Participating in peer review through collaborative documents creates a shared learning experience for international students. As they engage in reviewing and being reviewed, they develop a sense of camaraderie and mutual learning. The shared experience of working toward a common goal and collectively improving their work also makes them feel more connected with peers. International students may realize that they are not alone in their learning journey but are part of a supportive community where everyone is committed to each other's success.

In addition, this approach harnesses the power of collaboration and technology to enhance the overall learning experience of international students and strengthen their commitment to English language learning. The collaborative document platform allows for specific, targeted comments and suggestions that can be directly incorporated into the document. This not only benefits the recipient of the feedback but also helps the students providing the feedback deepen their understanding of the subject matter and enhance their own language skills as they analyze, evaluate, and offer suggestions for improvement. This kind of interaction promotes both language development and intercultural understanding, as international students gain exposure to different writing styles, perspectives, and cultural nuances, enhancing their linguistic competence and at the same time expanding their rhetorical

toolkit (Marshall et al., 2012). Through the collaborative nature of peer review, all students establish connections, build relationships, and develop a sense of belonging within a culturally and linguistically diverse learning community.

As a case in point, Cathy is a transfer student from a university in China. She was a top student back in China and is proficient in both oral and written English. However, she still faced challenges when studying in the United States:

> The way that people speak and write English here is different from what I learned in China. I often struggle with picking the most accurate word for my communication and sometimes my American peers cannot understand me because my thoughts are in Chinese and my expression might be an awkward translation of them.… In the collaborative peer review, I told my teammates that I would like them to point out the language issues (e.g., grammar errors, incorrect word choice, and unclear expressions) in my writing and I appreciated it that they were willing to do that. If I don't understand their comments, I would also ask for clarification. By fixing the language problems with their help, I improved my writing.… Reading all my teammates' writing on the collaborative document also enabled me to see different writing styles, and I felt happy when my teammates made changes to their writing according to my comments because it means that they care about my comments and I am able to help them as well.

Cathy's case suggests that peer review through collaborative documents empowers international students by providing them with an active role in their learning process. They become active contributors to their own learning and the growth of their peers. Collaborative document platforms also allow students to take ownership of their work, make revisions, and incorporate feedback, which enhances their sense of agency and autonomy. By actively participating in the peer review process, international students feel a greater sense of belonging, knowing that their contributions are valued and that they play a crucial role in the success of their group.

Nevertheless, it is worth noting that even though peer review through collaborative documents offers numerous benefits, it is essential to address potential challenges for international students and ensure inclusivity. Teachers should provide clear guidelines and expectations for the review process, establish a supportive and respectful environment, and promote peer-to-peer interactions in class (Aly et al., 2022). Otherwise, students, especially international students, may face negative experiences during peer review, which can include receiving feedback that is unconstructive or lacks usefulness, as well as feeling that their comments are undervalued by others. Additionally, teachers need to offer scaffolding and support for students to navigate the review process effectively and provide opportunities for reflection and discussion to address any concerns or difficulties that arise (Gueldenzoph & May, 2002). For example, John stated in the interview that it was beneficial to have a face-to-face group discussion after completing peer review on the collaborative document so that everyone got an opportunity to ask questions for clarifications or improvement. The course requirement of submitting a group plan for revision based on the peer review was also considered an important step to better prepare the group for their next collaborative writing task.

Summary

In today's digital age, technology has transformed the way people communicate, collaborate, and learn. Although group work plays a crucial role in learning, allowing students to interact, exchange ideas, and engage in collaborative tasks, it might pose challenges for international students because of linguistic barriers and cultural differences. However, the integration of online collaboration tools such as

discussion boards and collaborative document platforms has shown immense potential for enhancing students'—especially international students'—sense of belonging in group work and their overall learning experience.

Online discussion boards provide a virtual space where students can actively participate in group discussions, express their opinions, and establish connections with peers. This tool enables international students to overcome communication obstacles that may arise in face-to-face interactions. The asynchronous nature of online discussion boards offers opportunities for thoughtful reflection, as students can compose their responses and contributions at their own pace, allowing for more considered and comprehensive responses. Such inclusivity enhances collaboration and ensures that all students have equal opportunities to engage and contribute. This sense of participation and involvement also contributes to international students' sense of belonging and creates a supportive learning community.

Collaborative document platforms have also proven to be advantageous in facilitating students' ability to provide and receive constructive feedback in group work, bolstering the quality and impact of their collaborative projects. They also help foster a sense of community and shared responsibility for learning outcomes. Through collaborative peer review, students can collectively refine their ideas, exchange perspectives, and develop critical thinking skills. For international students in particular, this interactive learning experience offers significant benefits in terms of language and rhetorical development. Through the process of reviewing and providing feedback on their peers' work, international students are exposed to different writing styles, language structures, and rhetorical strategies. This exposure allows them to observe and internalize various language and rhetorical conventions used by proficient writers. Actively analyzing and discussing language choices, organization, and argumentation also contributes to those students' understanding and application of language and rhetorical principles. Overall, peer review on collaborative document platforms acts as a valuable tool for international students to improve language skills in an interactive and supportive environment. It also promotes the development of a sense of belonging, which is vital for academic success.

Above all, the findings of this study reveal that engaging in online discussions and collaborative peer review empowers international students to take ownership of their learning process. Thus, this study joins the call for educators to harness the potential of these technologies to create inclusive and effective learning environments where students feel connected and supported. The online collaboration tools such as discussion boards and collaborative document platforms remove obstacles for international students and encourage active participate in group work. They also allow them more time to prepare for effective communication with peers and help them develop a greater sense of responsibility for their contributions and their role within the group. Consequently, international students become more engaged, motivated, and invested in their learning journey.

Pedagogical Implications and Recommendations

This research offers valuable pedagogical insights for instructors aiming to enhance the learning experiences and sense of belonging of international students engaged in group work, particularly those for whom English is a second language. The challenges these students face in communication and interaction within groups can be mitigated by integrating online collaboration tools effectively.

First, instructors should purposefully structure groups, considering the linguistic diversity and cultural backgrounds of the students. Balancing teams in terms of language proficiency can promote equitable participation and encourage the sharing of diverse perspectives (Poupore, 2016). Emphasizing the value of diverse perspectives can help international students feel that their experiences and viewpoints are valued.

Second, it is essential to set clear expectations for participation in online discussions and collaborative peer reviews. Explain the purpose, criteria, and expected frequency of engagement. It is also crucial for instructors to provide guidelines on respectful communication and constructive feedback (M. Li, 2018). Integrating regular reflection assignments where students share their learning experiences, challenges, and successes within the online forum can foster a sense of shared journey.

Furthermore, fostering a supportive environment where open discussions about challenges and concerns are encouraged can substantially contribute to the sense of belonging among international students. Regular check-ins, both individual and group-wide, can provide opportunities for students to voice their apprehensions and receive guidance (Zengilowski et al., 2023). Such dialogue can lead to the development of strategies to overcome barriers, thereby promoting a collaborative atmosphere founded on trust and mutual respect.

By strategically utilizing online collaboration tools such as discussion boards and collaborative document platforms, instructors can cultivate a sense of belonging for international students, empower them to engage actively, and enhance their language proficiency and overall learning experience. Incorporating these pedagogical recommendations can not only enhance the learning outcomes of international students within the group work context but also contribute to a more inclusive and enriching educational environment for all students involved.

Limitation of the Research and Future Directions

Although this study has contributed valuable insights into the experiences of international students using online collaboration tools for group work, it is important to acknowledge its limitations. First, the sample was relatively small, consisting of only three international students. This limits the generalizability of the findings to a larger population. Additionally, the study focused solely on the experiences of international students, without comparative analysis with the experiences of L1 English-speaking students. Such a comparative approach could have provided a more comprehensive understanding of the dynamics involved.

Another limitation pertains to the study's duration, which was relatively short and might not have captured long-term effects or fluctuations in students' experiences over time. Moreover, this research predominantly relied on self-reported experiences, potentially introducing bias or recall inaccuracies in the participants' narratives. Objective measures, such as tracking the actual use of online tools or assessing the quality of group outputs, could have provided a more comprehensive perspective.

Building on the insights gained from this study, future research endeavors can address these limitations and offer a more holistic understanding of fostering a sense of belonging for international students with online collaboration tools. As a start, researchers are encouraged to incorporate a larger and more diverse sample of international students, including individuals with different linguistic and cultural backgrounds. In addition, longitudinal studies hold potential for capturing the evolving nature of students' experiences over time. By tracking these experiences over an extended period, researchers can capture potential changes and fluctuations in their sense of belonging within collaborative contexts.

Furthermore, a mixed-methods approach could enrich future investigations by combining qualitative insights from student narratives with quantitative data. This could involve tracking usage patterns of online tools, as well as assessing the quality of group outcomes, to offer a more comprehensive perspective on the impact of online collaboration on both learning outcomes and a sense of belonging. Last, as technology continues to evolve, future research could explore emerging technologies such as virtual reality or mixed-reality platforms. These innovative tools could offer a new context for examining international students' engagement and sense of belonging within collaborative activities. Following these directions in future research can contribute to a

comprehensive understanding of the intricate interplay between online collaboration tools and the creation of a sense of belonging for international students in higher education settings.

Appendix

Appendix 1: Interview Questions for the Focus Group.

For Research Question 1—To what extent does the implementation of online collaboration tools enhance international students' participation, interaction, and collaboration in group work?
1. Can you share your experiences with using online collaboration tools in group work?
2. How have these tools affected your ability to participate actively in group discussions and tasks?
3. In what ways have online collaboration tools influenced your interactions with your group members?
4. Have you noticed any changes in the level of collaboration within your group since the implementation of these tools?
5. Can you provide examples of instances where the use of online tools led to increased engagement and better collaboration?
6. Are there any challenges you've encountered while using these tools for group work?
7. How do you perceive the impact of these tools on the overall quality of your group's work?

For Research Question 2—How does this influence their overall sense of belonging to the learning community?
1. How connected do you feel to the learning community while using online collaboration tools in group work?
2. Have you noticed any changes in your sense of belonging to your academic community since the implementation of these tools?
3. Can you share examples of moments when the use of online tools positively or negatively influenced your sense of belonging?
4. Do you think that online collaboration tools enhance your connection to your peers and instructors? Why or why not?
5. Are there specific features or aspects of these tools that contribute to your feeling of being part of a learning community?
6. Are there any ways you believe the tools could be improved to further enhance your sense of belonging?

Other General Questions
1. How do you compare your experiences with online collaboration tools to traditional face-to-face group-work methods?
2. What recommendations do you have for optimizing the use of online collaboration tools for group work?
3. How important do you think it is for international students to feel connected to their peers and learning community? How does technology play a role in this?
4. Is there anything else you'd like to share about your experiences with online collaboration tools and their impact on your group work and sense of belonging?

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Appendix 2: A Sample of Categorized Themes and Codes.

Theme	Code (subcode)	Example
Challenges for international students in group work	Language barriers	"I sometimes struggle with expressing my ideas effectively due to language limitations. Communicating complex business concepts and ideas in a group setting can be especially challenging." (Sam, interview, 2022)
	Cultural differences	"Group work often involves collaboration with peers from diverse cultural backgrounds. I find it somewhat difficult to navigate cultural nuances in communication styles, teamwork expectations, and decision-making processes." (Cathy, interview, 2022)
	Unequal participation	"I feel hesitant to contribute actively in discussions due to a fear of making mistakes or a lack of confidence in my language skills." (John, interview, 2022)
	Time constraints	"I need more time to process information and think about my responses. This may lead to time-related challenges during group discussions and collaborative activities." (Cathy, interview, 2022)
	Meeting expectations	"Business writing classes require a high level of professionalism in communication. I sometimes find it difficult to meet these expectations, leading to frustration." (John, interview, 2022)
	Group dynamics	"Building rapport and establishing effective group dynamics can be difficult when I am communicating with native speakers or others with higher language proficiency. I don't know when I should speak up, and sometimes there are feelings of isolation or marginalization." (Sam, interview, 2022)
Benefits of using online discussion boards	Written communication	"Group discussion boards mainly involve written communication, which allows me to carefully construct and edit my contributions. This can alleviate the pressure of spontaneous oral communication and enable me to express my thoughts more clearly." (John, interview, 2022)
	Time flexibility	"Online discussion boards provide flexibility for me to participate at my own pace. I can take the time I need to compose thoughtful responses without the pressure of face-to-face interactions." (Sam, interview, 2022)
	Reduced anxiety	"I often experience anxiety when speaking up in group discussions. Using a discussion board reduces the anxiety associated with speaking and allows me to focus on conveying my ideas effectively." (Cathy, interview, 2022)
	Equal participation	"In face-to-face discussions, I might hesitate to participate due to language barriers. In a discussion board, contributions are given equal weight, allowing me to engage more actively without the fear of being overshadowed." (Sam, interview, 2022)

Theme	Code (subcode)	Example
	Collaborative learning	"Written discussions on a board create a record that I can refer back to. I can learn from my peers' responses, share insights, and benefit from different perspectives." (John, reflective essay, 2022)
Benefits of doing peer review on collaborative document platforms	Clearer and more structured feedback	"Collaborative platforms make the peer review process more organized and systematic. I can provide and receive feedback directly on the document, making it easier to understand and address specific areas for improvement." (Sam, reflective essay, 2022)
	Reduced language anxiety	"I feel more comfortable offering feedback in writing rather than speaking. Collaborative document platforms reduce my language anxiety and allow me to express myself clearly and thoughtfully." (John, interview, 2022)
	Language modeling and peer learning	"Working on the collaborative document, I can learn from my peers' writing styles and language usage, and improve my own language skills." (Cathy, reflective essay, 2022)
	Revision tracking	"Collaborative platforms track changes and revisions, allowing me to see how my work evolves over time and learn from the editing process." (John, reflective essay, 2022)
	Higher engagement	"Collaborative platforms have interactive features, making the peer review process more engaging and enjoyable for me." (Sam, interview, 2022)
Sense of belonging	Community building (feel valued)	"The questions they (the peers) asked make me think deeper, refine my ideas. I feel that I become an active participant in the discussion. In other classes, I might hide myself in the corner, but on the discussion board I sometimes can stand out." (Cathy, interview, 2022)
	Community building (bonding and trust)	"The discussion board wasn't just a class thing for us. After throwing our thoughts on the case up there, my group and I turned it into a spot for sharing stuff and clarifying doubts. It's almost like a study group and we can rely on each other." (John, interview, 2022)
	Shared responsibility	"The peer review setup in this class was something new to me. With our work laid out on a shared document, it felt like we were all in the same boat…. This collective effort made the peer reviews more than just evaluations; we all played a part in shaping the quality of our work." (Sam, interview, 2022)
	Shared learning experience	"I actually asked my peers to polish my writing because I was not very confident about my language. However, it is not just about fixing errors. I especially appreciate the conversations that we had about why certain things worked or didn't. " (John, interview, 2022)

Note. Cathy, John, and Sam are pseudonyms.

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