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Adapting Education: Navigating Hybrid Classrooms in The Post-Pandemic Era

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Abstract: Hybrid classrooms are designed to support collaborative learning experiences. This concept encourages students to actively engage within learning communities. This study investigates the applicability of hybrid classrooms in a university. Researchers utilized a CoI questionnaire adapted from Swan et al., (2008). It contains 36 items, all measured on a 4-point Likert scale. The questionnaires measure the three components of the CoI model. The participants consisted of accounting students who enrolled in Taxation courses in 2023, totaling 140 individuals. This result finds that students have effective social interaction, active engagement, and critical inquiry in the hybrid classroom. Students expressed a positive sentiment towards the hybrid classroom. The hybrid classroom undeniably has great potential for a flexible learning model for both students and educators in the future. While this study offers valuable insights into the perceptions of students regarding the hybrid classroom, the limitations, lack of demographic data, reliance on self-report measures, and absence of qualitative data, must be acknowledged when interpreting the findings.

Keywords: Collaborative learning, Community of inquiry, Flexibility, Hybrid classroom, Student perception

INTRODUCTION

After the COVID-19 pandemic, universities created innovative solutions to enhance the student learning experience (Kalmar et al., 2022; Sunitha et al., 2022; Vital-López et al., 2022). The restrictions and social distancing in many countries and educational institutions, particularly in the realm of business education, have transformed face-to-face classrooms into online classrooms (Raes, 2022; Triyason et al., 2020). Starting in 2022, approximately 70% of universities worldwide resumed offering face-to-face education. This moment was marked as the beginning of a tripartite educational system of face-to-face, online, and hybrid classrooms (Raes et al., 2020a & 2020b). Hybrid classrooms, are a novel approach, allowing students to participate in both virtual and in-person interactions. However, despite its potential benefits, this learning model presents various challenges, encompassing both pedagogical and technological aspects (Raes et al., 2020a & 2020b).

The emergence of the hybrid classroom concept aims to highlight student participation and engagement in the learning process, especially when the COVID-19 pandemic becomes more manageable. Hybrid classrooms are designed to support collaborative learning experiences such as peer learning and flipped learning. This concept encourages students to actively engage within learning communities (Castellanos-Reyes, 2020; Garrison et al., 2001). This educational framework is compatible with the Community of Inquiry (CoI) model introduced by Garrison et al. (2001) and further refined by Shea et al. (2022). While the CoI model has been applied in the

context of online classrooms (Kaul et al., 2018; Thymniou & Tsitouridou, 2021), the identification of hybrid classrooms is open for investigating the applicability and efficacy of the CoI model. This is the novel educational setting in our university, Krida Wacana Christian University (UKRIDA).

The objective of implementing hybrid classrooms in universities is to enhance student engagement and learning outcomes by combining the benefits of face-to-face instruction with the flexibility of online learning. This approach offers students the choice to attend classes in person or remotely, accommodating diverse needs and circumstances. Hybrid classrooms foster increased engagement through active learning strategies and technological tools, enabling personalized learning experiences where students can access materials at their own pace. Additionally, universities with the adaptability to respond to changing conditions, such as the COVID-19 pandemic, ensure continuity in education. By encouraging collaboration among students, both in-person and online, hybrid classrooms create a sense of community and optimize resource use, ultimately preparing students for success in an increasingly digital world.

Hybrid classrooms represent a dynamic presence between physical (onsite) and virtual (online), embedded in the framework of blended learning (Huizinga et al., 2022). This approach enables students to participate synchronously in the learning environment, regardless of their location. (Raes, 2022; Raes et al., 2020a & 2020b). The organizational advantages of hybrid classrooms are as follows. First, a hybrid classroom helps students from the constraints of physical location and promotes greater interaction between students and lecturers. Second, hybrid classrooms are efficient in the time and cost associated with students, as well as those who need sick or leave permits. Third, a hybrid classroom promotes the efficiency of lectures to reach students across various locations and classroom capacities (Raes et al., 2020a & 2020b).

From a pedagogical standpoint, hybrid classrooms offer differences in learning experience, following through the limitations of time and place. Students are empowered to create their learning journey into their preferences and commitments and ensure they can actively engage in learning activities without constraint (Bower et al., 2015; Raes et al., 2020a & 2020b). This flexibility initiates the positive advantages in learning experiences and opportunities.

Despite the promising advantages of hybrid classrooms, several research studies have highlighted the challenges associated with this educational approach. The first challenge is the necessity for new teaching methods and technological competencies in hybrid classrooms (Desimone, 2009). Comparing fully online or fully face-to-face settings, a hybrid classroom needs strategies for complexity, professional development, and the lecturers' experiences. Studies conducted by Raes et al., 2020a & 2020b and Raes (2022) highlight the need for motivation, peer relations, a sense of belonging, and group challenges within hybrid classrooms. Social skills are important in learning environments, as emphasized by Huizinga et al. (2022). Additionally, learner's active participation becomes the crucial component for success in hybrid classrooms. For that reason, lecturers need to improve pedagogical innovation and technological adaptation.

The Community of Inquiry Model (CoI), initially conceptualized by Garrison et al. (1999), has been instrumental in guiding educators in the design of online classrooms. CoI helps educators evaluate learners in collaborative groups or individuals who actively engage in the learning environment. That instrument realizes the ability of social connection through the learner's participation. The CoI model develops based on three essential components: social, teaching, and cognitive (Shea et al., 2022; Stenbom, 2018). To maximize the use of the CoI framework, educators and learners need to engage in a similar educational environment (Garrison et al., 2001; Shea et al., 2022; Stenbom, 2018; Swan et al., 2008). Recent studies have shown that the CoI model was applied beyond its original application, in the online classroom (Hilliard & Stewart, 2019; Le Roux & Nagel, 2018). This finding ensures the effectiveness of the CoI model in a hybrid classroom.

The first component in the CoI model is social presence. This component measures the learners feeling, socially and emotionally and connects with others in the learning environment (Castellanos-Reyes, 2020; Chen, 2022; Swan et al., 2008). In hybrid classrooms, social presence could be challenging, as learners are settled in virtual and face-to-face positions. However,

Huizinga et al. (2022) suggest that hybrid classrooms create learning opportunities within communities. It enables learners to feel like integral members of the classroom community. As highlighted by Shea et al. (2022), communication among learners develops trust and a sense of belonging in a hybrid classroom. Moreover, active involvement in learning activities increases interpersonal relationships (Molano & Polo, 2015; Wang, 2005). Some previous research finds the importance of interaction in hybrid classrooms (Raes et al., 2020a & 2020b).

The second in the CoI model is teaching presence. This component measures the actions and interventions undertaken by instructors to design, facilitate, and support cognitive and social engagement to achieve learning outcomes (Garrison et al., 2001). Chen (2022) also notice that teaching presence is expressed in all activities undertaken by lecturers within a course to stimulate the learning process. It includes providing feedback and making student encouragement. Lecturers, as the central agents of teaching presence, play a critical role in the interaction process between face-to-face and online learners. They are promoting the learning process for all students, ensuring their active involvement, and creating interactions among them. This action provides a supportive learning environment, where students feel encouraged to participate and collaborate. Through effective instructional design, facilitation of discussions, and direct instruction, lecturers have a well-learned atmosphere and bridge the gap between face-to-face and virtual learning spaces in hybrid classrooms.

The third component of the CoI model is cognitive presence. This component measures the processes of exploration, construction, resolution, and confirmation of understanding through collaboration and reflection within a community of inquiry (Garrison, 2007). Cognitive presence is crucial for acquiring new insights, through activities such as reflecting on actions and outcomes. In the context of CoI, cognitive presence is strengthened when students feel connected. Therefore, the combination of social presence and cognitive presence will support the learning environment. Effective guidance, through various learning activities, plays an important role within the CoI framework. Teaching presence is instrumental which facilitates discussions of the CoI. Lecturers' interventions, such as structuring learning activities and/or providing reflection, help to develop students' cognitive engagement and explore the topics. Through the integration of teaching presence, social presence, and cognitive presence, the CoI model promotes a dynamic and collaborative learning environment where students actively construct knowledge, engage in critical inquiry, and develop a good understanding of the topic.

METHOD

After the COVID-19 pandemic, our university, Universitas Kristen Krida Wacana (UKRIDA) prioritized the implementation of efficient and adaptive learning methods. The university focuses on adapting to the dynamic educational system between face-to-face, and online, and trying hybrid learning. The Accounting Department has had the initiative to pilot a hybrid classroom since 2022. This hybrid classroom was set in Taxation courses, collaborating with the faculty lecturer, one of whom is a co-author of this study. The Accounting Department made a dedicated effort to prepare the classroom facility and the availability of technological support.

To evaluate the success of a hybrid classroom, the researchers utilized a CoI questionnaire adapted from Swan et al. (2008). It contains 36 items, all measured on a 4-point Likert scale. The questionnaires measure the three components of the CoI model. We translate the questionnaires into *Bahasa Indonesia*, to help respondents easy to fill up the instrument. We change the original scale, from 5-point to 4-point, to cut off the neutral perception. We believe with no neutral scale we will have the respondent tendential, such as tend to agree or tend to disagree.

The participants consisted of accounting students who enrolled in Taxation courses in 2023, totaling 140 individuals. According to the data tabulation in Figure 1, we concluded that most of the respondents (77%) prefer hybrid classrooms rather than onsite and online classrooms. Within 140 respondents, we notify most of them (64%) are female students in Figure 2.

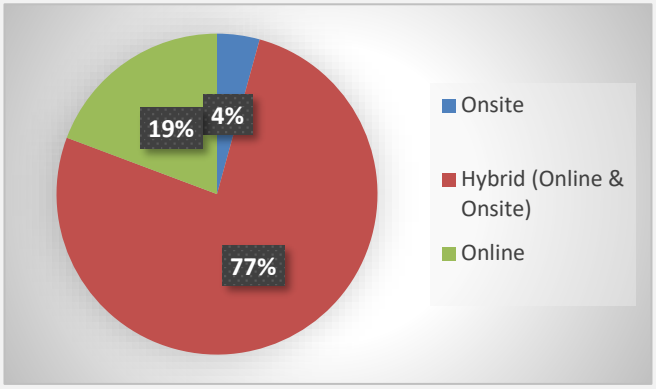

Figure 1. Student Preference on Classroom Type (Data Analysis, 2024).

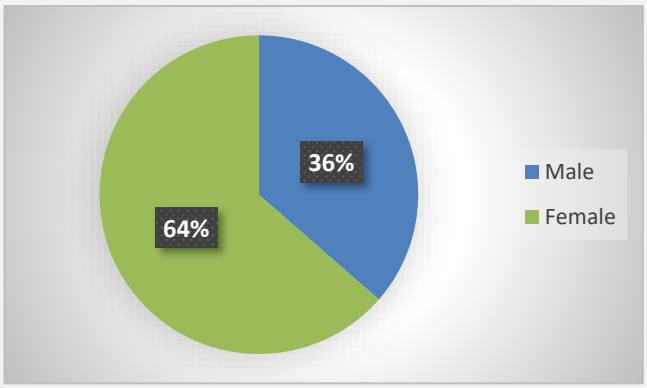

Figure 2. Respondent's Gender (Data Analysis, 2024).

Quantitative data analysis using Cronbach's alpha ensures the reliability of each CoI's component: teaching presence, social presence, and cognitive presence. The obtained Cronbach's alphas in Table 1 were high, indicating the measurement instruments are reliable (DeVellis & Thorpe, 2022).

Table 1. Reliability Analysis of Instrument

	Number of items	Cronbach alpha
Social Presence	10	0.7611
Teaching Presence	14	0.9453
Cognitive Presence	12	0.9281

Source: Data Analysis with STATA (2024)

RESULTS & DISCUSSION

Result in Social Presences

The students reported a negative perception of the social presence scale, as indicated in Table 2. The average score in each perception is mostly below the 3 points, with the standard deviation score being relatively low. The comparison between mean score and positive perception in a sample is represented in Figure 3. This finding ensures that students did not have effective social interaction in the hybrid classroom. When lecturers were preparing their lessons, they lacked visibility of which students were attending classes online and who were attending face-to-face (onsite). This condition will influence the teaching methods. Lecturers need to find the best efforts to involve all students in the hybrid classroom. Therefore, lecturers play a role as moderators, coaches, or even facilitators within student interaction. Lecturers need to design learning activities

to shape their social presence. Strategies such as adjusting camera angles, spotlighting the student speakers, and creating a breakout room for discussion have been implemented during sessions to enhance social interaction.

Table 2. Mean and Standard Deviation of Social Presence

Code	Statements	N	Mean	Std. Dev
SP01	Getting to know other students makes my class livelier.	140	3,4357	0,8065
SP02	I was able to create a special impression for other students.	140	3,0714	0,7647
SP03	Online communication via chatrooms is an excellent medium for social interaction.	140	2,7929	0,9633
SP04	I feel comfortable conversing via online media.	140	2,8857	0,9220
SP05	I feel comfortable participating in collaborative learning activities	140	3,0714	0,8366
SP06	I feel comfortable interacting with other students.	140	3,3000	0,7167
SP07	I feel comfortable disagreeing with other students while maintaining a sense of trust.	140	2,6786	0,8589
SP08	I feel, when I take online lectures, I have enough opportunities to express my opinion.	140	2,6643	0,9936
SP09	I feel that recognized and accepted by other students.	140	2,9786	0,7631
SP10	Discussions helped me develop a sense of collaboration within the group.	140	3,4286	0,7505

Source: Data Analysis STATA (2024)

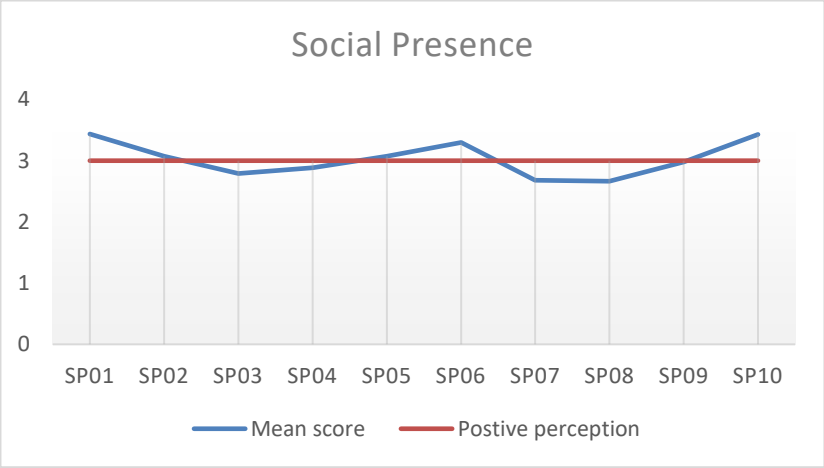

Figure 3. The comparison in Social Presence (Data Analysis, 2024)

Result in Teaching Presences

Teaching in the hybrid classroom posed lecturers with a time-constrained challenge. The lecturers had limited time to redesign their course from face-to-face classrooms into hybrid classroom settings. Similarly, students also have a challenge to accommodate the dynamic learning environment in the hybrid classroom (Huizinga et al., 2022). Responding to that challenge, the researchers adapted their teaching methods to cater to the needs of hybrid classrooms. This adjustment made lecturers add tools and alternative learning activities in their lessons, such as online quizzes. These integration activities made a hybrid classroom more complex than a face-to-face and/or online classroom. Lecturers spent more energy on allocating their attention between online students and onsite students. Another challenge was how to navigate the hybrid classroom in nonverbal communication such as group work. The focus between online and onsite

students might be risky for missing crucial information, therefore lecturers needed to enhance the clarity of communication. Table 3 highlights within the teaching presence scale, all mean scores exceeded 3, indicating a positive trend towards active engagement and critical inquiry in the hybrid classroom. The comparison between the mean score and positive perception in a sample is represented in Figure 4.

Table 3. Mean and Standard Deviation of Teaching Presence

Code		N	Mean	Std. Dev.
TP01	Lecturers communicate lecture topics	140	3,3429	0,6545
TP02	Lecturers communicate the objectives of the lecture	140	3,3857	0,6525
TP03	Lecturers provide clear instructions on how to participate in lecture activities.	140	3,3643	0,6593
TP04	Lecturers communicate important dates and times for lecture activities.	140	3,3714	0,6272
TP05	The lecturer was very helpful in explaining the lecture topics in detail which helped me to learn.	140	3,3286	0,6618
TP06	Lecturers are very helpful in guiding students to understand lecture topics in a way that suits my thinking.	140	3,2286	0,6926
TP07	Lecturers help keep online students engaged and participate in productive discussions.	140	3,2643	0,7549
TP08	Lecturers help keep onsite students engaged and participating in productive discussions.	140	3,3571	0,7204
TP09	Lecturers help keep students busy with assignments relevant to the course.	140	3,3286	0,6726
TP10	Lecturers encourage students to explore new concepts in lectures.	140	3,2500	0,7210
TP11	Lecturers strengthen the development of a sense of togetherness among students.	140	3,1214	0,7908
TP12	Lecturers help focus discussions on relevant issues in the lecture process.	140	3,2929	0,6515
TP13	Lecturers provide feedback that helps students meet the course objectives.	140	3,2643	0,6954
TP14	Lecturers provide timely feedback	140	3,1000	0,6922

Source: Data Analysis STATA (2024)

Result in Cognitive Presence

Cognitive presence is an integral part of the learning process which ensures the student's knowledge about the course material. This process is challenging when students arrive unprepared for class. They might find it difficult to follow the instructions, learning activities, and assessment criteria. Ensuring success in the cognitive presence is also challenging for lecturers, especially in hybrid classrooms, because it needs more concern. To address this challenge, lecturers may prepare short instruction and delivery methods. Therefore, the students could notice and became more flexible in following the instruction. The hybrid classroom needs more concern and monitoring activities (Huizinga et al., 2022). Lecturers should be proactive in acknowledging students in hybrid settings and pay full attention to interaction and learning. There will be a discrepancy in knowledge transfer between onsite and online students. However, the lecturer can make some notes to tackle those problems and review the materials in another meeting. Table 4 shows students' perceptions regarding cognitive presence. Also, the comparison between the mean score and positive perception in a sample is represented in Figure 5. It highlights students' expectations of acquiring knowledge and learning activities' success. These findings show the importance learning environment that encourages active engagement and critical thinking among students,

regardless of the mode of instruction. The positive response from students in cognitive presence suggests that a hybrid classroom is promising in the future.

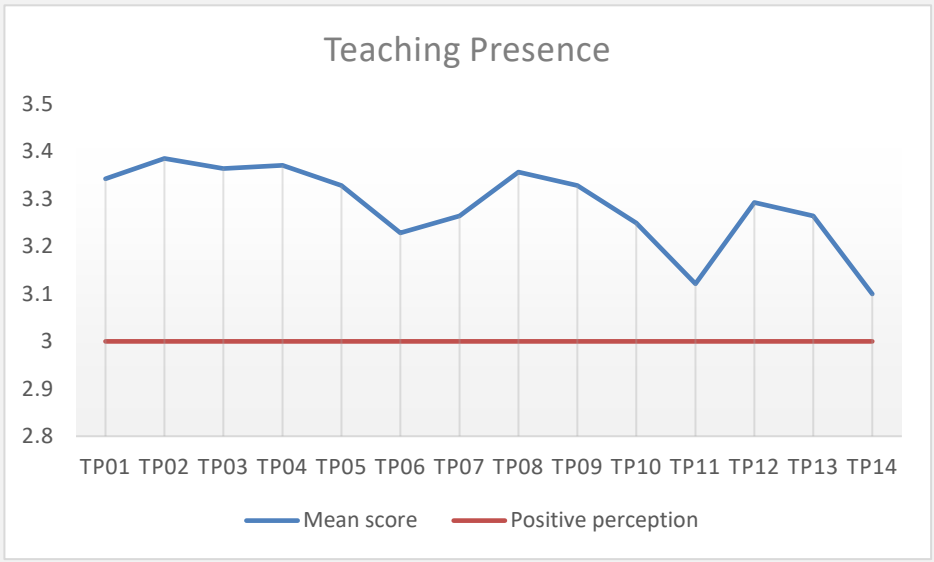

Figure 4. The comparison in Teaching Presence (Data Analysis, 2024)

Table 4. Mean and standard deviation of Cognitive Presence

	N	Mean	Std. Dev.
The topics taught increased my interest in the lecture.	140	3,1571	0,7517
Lecture activities increase my curiosity.	140	3,2429	0,7382
I feel motivated to explore lecture-related material	140	3,1429	0,7053
I utilize various sources of information to explore the topics taught in this lecture.	140	3,3214	0,6707
Brainstorming and finding relevant information helps me understand lecture topics better	140	3,3214	0,6599
Online discussions have been invaluable in helping me see different perspectives	140	3,0429	0,8386
Combining new information helps me understand the lecture topic being taught	140	3,3714	0,6157
Lecture activities helped me personally.	140	3,3214	0,7323
Discussions helped me understand the basic concepts in this lecture.	140	3,3500	0,6562
I can explain how to test and apply the knowledge gained in this lecture.	140	3,0929	0,7187
I can find solutions through lectures that can be applied in practice.	140	3,1786	0,7224
I can apply the knowledge gained in this lecture to work or other activities outside of class.	140	3,2929	0,6624

Source: Data Analysis STATA (2024)

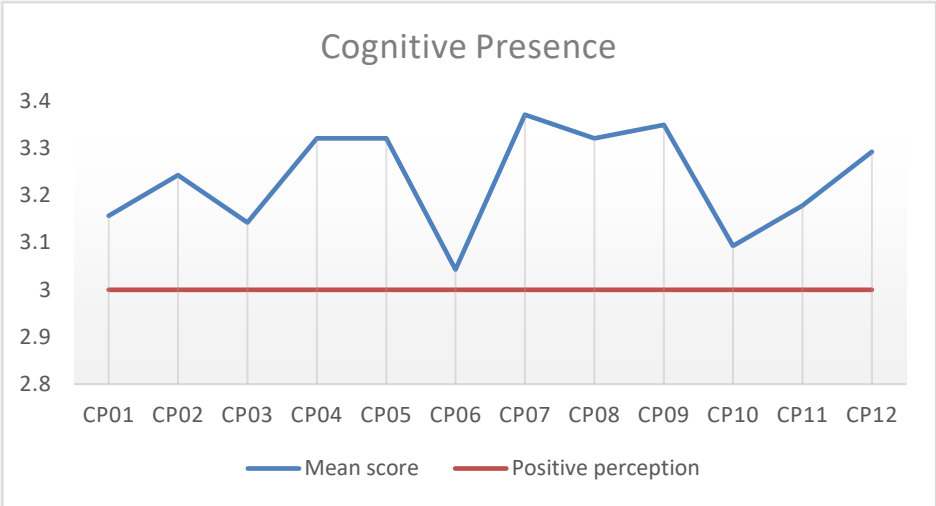

Figure 5. The Comparison in Cognitive Presence (Data Analysis, 2024)

DISCUSSION

After the COVID-19 pandemic, the educational landscape and learning methodologies were changed dynamically (Sunitha et al., 2022; Triyason et al., 2020). In this study, we explore hybrid classrooms in a university to showcase the potential benefits of future education. In this research, we specifically addressed the implementation of hybrid classrooms to enhance students' social connectedness. Recent studies (Butnaru et al., 2021; Collazos et al., 2021; Shi et al., 2021) highlight the critical role of social connectedness as a prerequisite for students' active engagement and cognitive involvement in lessons. To achieve that, interaction, students' awareness, and emotions should be well managed in hybrid classrooms. The research by Butnaru et al. (2021) identifies social isolation as a key risk during the transition from onsite to online education, highlighting its detrimental impact on students' sense of social connectedness, leading to increased feelings of loneliness and decreased well-being. Collazos et al. (2021) emphasize the importance of designing online platforms that support social connectedness by integrating emotional and social elements, which can enhance students' engagement and overall experience in digital learning environments. Shi et al. (2021) find that blended synchronous learning environments, which combine online and face-to-face interactions, positively influence students' social connectedness by maintaining a balance between virtual and in-person engagement, thereby boosting motivation and cognitive engagement. Collectively, these studies underscore the critical role of fostering social connectedness in online and blended learning environments to support student well-being and engagement.

Our study demonstrated the potential of hybrid classrooms in enhancing students' sense of Community of Inquiry (CoI). It also revealed opportunities for further improvement, particularly in enhancing students' social presence. To optimize the hybrid classrooms, the lecturers tailor their face-to-face course design to hybrid design to align with their teaching preferences (Borko, 2004). This study finds the significant demands of lecturers in a hybrid classroom. We suggest adding more pedagogical training to support the learning environment (Fernández-Batanero et al., 2022; Raes et al., 2020a & 2020b; Triyason et al., 2020). The research by Fernández-Batanero et al. (2022) emphasizes the urgent need for pedagogical training in online education, especially during crisis times, highlighting how educators were often unprepared for the rapid transition to digital teaching and needed to develop new skills for effective online instruction. Raes et al. (2020a) review the gaps in synchronous hybrid learning, identifying a lack of comprehensive pedagogical training for instructors as a major challenge in delivering effective hybrid education. They stress the importance of equipping teachers with the necessary skills to manage both in-person and online students simultaneously. In a related study, Raes et al., (2020b) investigate hybrid virtual

classrooms, finding that interactive tools like quizzes can enhance student engagement but require teachers to be adept at using these tools effectively, further underlining the need for targeted pedagogical training. Lastly, Triyason et al., (2020) explore the design of hybrid classrooms for the post-pandemic era, emphasizing that educators must be trained not only in technology but also in new instructional strategies that blend physical and virtual teaching environments. Collectively, these studies underscore the critical importance of comprehensive pedagogical training to ensure educators are well-prepared to navigate the complexities of online and hybrid learning environments. Lecturers must be knowledgeable and have additional competencies beyond the traditional face-to-face setting (Koehler & Mishra, 2009). This necessitates acquiring new skills and techniques in a hybrid classroom format, which may include proficiency in digital tools and platforms, facilitating virtual interactions, and adapting instructional strategies to engage both online and onsite students effectively.

The hybrid classroom undeniably has great potential for flexibility for both students and educators in the future. By offering students the option to choose their preferred location for attending classes, whether it is onsite or online, the hybrid classroom significantly expands accessibility to course offerings for a diverse range of learners. This flexibility is particularly advantageous in the future of education. Moreover, the flexibility offered by the hybrid classroom promotes a more inclusive learning environment by accommodating the diverse needs and preferences of students. It fosters a sense of empowerment and autonomy in their educational journey. Overall, the hybrid classroom offers choice and flexibility in learning locations, enriching the educational experience for all students, regardless of their circumstances or constraints.

CONCLUSION

As a result of the study, students expressed a positive sentiment towards the hybrid classroom, as evidenced using Community of Inquiry (CoI). Hybrid classrooms offer a sense of social connectedness among students and promote each presence of CoI framework. Both lecturers and students highlighted the potential benefits of hybrid virtual classrooms in enhancing educational flexibility. However, to optimize this learning model, further insights are needed on how to enhance interaction between onsite and online groups. Additionally, it is important to investigate which course content and learning outcomes are most suitable for delivery in a hybrid classroom. It ensures alignment with the unique dynamics and requirements of this instructional format. By addressing these considerations, we can maximize the effectiveness of hybrid classrooms and offer a more enriching and inclusive learning experience for all students.

The conclusion emphasizes the potential of hybrid classrooms for flexibility and positive student engagement, highlighting the need for educators and policymakers to implement strategies that maximize these benefits. Educators should ensure technological support, use active learning approaches, facilitate communication, foster a student-centered environment, and utilize feedback mechanisms. Policymakers should allocate necessary resources, develop supportive policy frameworks, conduct regular evaluations, design holistic learning environments, and conduct empirical research to inform pedagogy. By applying these practical implications and strategies, educators and policymakers can improve the implementation of hybrid classrooms, enhancing flexibility and student engagement.

The limitation of this study comes from the voluntary nature of student participation in filling out the CoI questionnaire. The questionnaire did not include additional background variables such as age, gender, or cultural background. This lack of demographic data complicates the interpretation of findings, particularly concerning students' technical skills. Furthermore, the CoI questionnaire utilized in the study is a validated instrument that relies on self-report measures, which may introduce biases in how students score the questionnaires. Additionally, the study only collected quantitative data from students, potentially overlooking relevant contextual factors that could provide deeper insights into their responses. Moreover, technical issues, including internet speed and the minimum available technical capabilities in standard classrooms were not investigated in this research. In summary, while this study offers valuable insights into the

perceptions of students regarding the hybrid classroom, the limitations, lack of demographic data, reliance on self-report measures, and absence of qualitative data, must be acknowledged when interpreting the findings.

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