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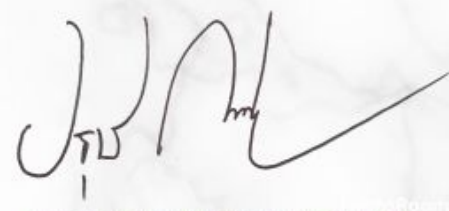
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# **Fostering A Sense of Community and Engagement in Virtual Flipped Classrooms: The Role of Asynchronous Sessions**

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## **Abstract**

The virtual flipped classroom is an instructional model that utilises both asynchronous and synchronous sessions and has become popular in education. However, the relationship between virtual flipped classrooms and the concept of a community of inquiry is not well understood. This study examines the role of asynchronous sessions in fostering a sense of community and engagement among students in virtual flipped classrooms. The study is based on the Community of Inquiry (CoI) framework, which posits that students' sense of belonging and engagement is critical for developing a community of inquiry. The study reviews the literature on the concept of a community of inquiry and how it applies to virtual flipped classrooms and existing theoretical frameworks related to virtual flipped classrooms. The study analyses how the use of asynchronous sessions in virtual flipped classrooms can impact the development of a community of inquiry and discusses the potential challenges and limitations of asynchronous sessions in virtual flipped classrooms. The study finds that asynchronous sessions can play a crucial role in fostering a sense of community among students and promoting engagement, which are essential elements in the CoI framework but also highlights the challenges of lack of immediate feedback and potential technical difficulties. The study concludes that the design and implementation of asynchronous sessions should be aligned with the CoI framework to optimise the chances of fostering community and engagement among students in virtual flipped classrooms.

Keywords: Asynchronous sessions, Community of Inquiry, Student engagement, Virtual flipped classroom

## **1. Introduction**

The virtual flipped classroom is a pedagogical model that employs both asynchronous and synchronous sessions to deliver instruction (Antonio 2022; Gopalan et al. 2021; Humrickhouse 2021; Ismail and Abdulla 2019; Marshall and Kostka 2020; Rehman and Fatima 2021). Its flexible nature has made it increasingly prevalent in the field of education. However, the relationship between virtual flipped classrooms and community of inquiry has not been extensively researched. The community of inquiry (CoI) framework is a theoretical model that offers a comprehensive perspective on a community of inquiry in online learning environments (Cleveland-Innes 2019; Kim and Gurvitch 2020; Nasir and Ngah 2022; Shea and Bidjerano 2009; Yandra et al. 2021). It posits that a sense of belonging and engagement among students is vital for developing a community of inquiry.

Existing research on flipped classrooms has predominantly focused on student satisfaction and academic achievement (Alamri et al. 2021; Debbağ and Yıldız 2021; Hew et al. 2020; Martínez-Jiménez and Ruiz-Jiménez 2020; Phillips and O'Flaherty 2019; Van Wart et al. 2019). The development of a sense of community among students has been understudied. This study aims to bridge this gap in the literature by investigating the role of asynchronous sessions in promoting a sense of community and engagement among students in virtual flipped classrooms.

Our study, steeped in prevalent theories and frameworks, including the Community of Inquiry (CoI) framework, Self-Determination Theory, and Technology Acceptance Model, undertakes a rigorous critique and synthesis of the existing literature. It focuses on gaining new insights into the intricate relationships between virtual flipped classrooms and the CoI.

The persuasive disposition of our research is reflected through the analysis, which posits that asynchronous sessions act as catalysts for community building and student engagement. It proposes a blend of asynchronous and synchronous sessions as an optimal strategy for virtual flipped classrooms, fostering a shared sense of belonging among students. This research also scrutinises the technical facets of virtual flipped classrooms, underscoring the vital role of students' technical proficiencies and the quality and accessibility of the technology employed. The analysis postulates that the design of asynchronous activities should embody user-friendliness and navigability.

A holistic analysis concerns the interplay between virtual flipped classrooms and the CoI. This argumentative evaluation leans on diverse theoretical frameworks, promoting the usage of asynchronous sessions and a balanced methodology in virtual flipped classrooms. By acknowledging technical and technological variables, this research offers fresh perspectives on the design and application of virtual flipped classrooms, thereby contributing valuable insights to the education sphere.

The study's foundation is the CoI framework, presenting a theoretical blueprint for understanding the concept of CoI in virtual flipped classrooms. This framework maintains that social, teaching, and cognitive presence are paramount in nurturing a CoI (Chen 2022; Dempsey and Zhang 2019; Kim and Gurvitch 2020; Nolan-Grant 2019; Zhang et al. 2022).

A thorough review of the literature concerning the CoI concept as applicable to virtual flipped classrooms, along with existing related theoretical frameworks, is conducted. The research explores the influence of asynchronous sessions in virtual flipped classrooms on forming a CoI while contemplating the potential challenges and limitations of asynchronous sessions.

The research seeks to elucidate: How do asynchronous sessions cultivate community and engagement among students in virtual flipped classrooms? Its significance lies in the pursuit of augmenting comprehension of the relationship between virtual flipped classrooms and the CoI. Such insights can aid educators in devising and executing virtual flipped classrooms that stimulate community spirit and student engagement. Our research employs a theoretical analysis approach, striving to reveal the intricate relationship between virtual flipped classrooms and the CoI from a theoretical standpoint.

The remainder of the paper adheres to the following structure: The subsequent section delves into a literature review on the CoI concept, its relevance to virtual flipped classrooms, and associated theoretical frameworks. The following section presents the theoretical analysis, investigating the effects of asynchronous sessions in virtual flipped classrooms on the evolution of a CoI. The closing section illustrates the conclusions and implications of the research.

## **2. Literature Review**

Our examination of extant literature seeks to impart an understanding of the community of inquiry (CoI) concept, its relevance to virtual flipped classrooms, and associated theoretical frameworks. The CoI framework is a theoretical construct that delivers an all-encompassing viewpoint on the CoI in digital learning landscapes (Martin et al. 2022; Nasir and Ngah 2022; Patwardhan et al. 2020). This structure underscores that social, teaching, and cognitive presence are foundational for cultivating a CoI (Cakiroglu 2019; Moore and Miller 2022; Swan et al. 2020).

"Social presence" represents how strongly students perceive their connection with and the instructor's existence (Al-Amrani and Harrington 2020; Kilis and Yildirim 2019; Wut and Xu 2021). "Teaching presence" alludes to the design, facilitation, and direction of cognitive and social processes for achieving personally meaningful and educationally worthwhile outcomes (Garrison 2022; Goh 2020; Wang and Liu 2020). "Cognitive presence" characterises the learners' ability to construct meaning through prolonged communication and introspection.

Previous literature has demonstrated the CoI framework's utility in deciphering community genesis in virtual flipped classrooms. Studies exhibit that asynchronous activities such as online discussions can encourage social presence and community formation among students (Chen and Liu 2020; Delello et al. 2019; Guo et al. 2022). However, other research shows that asynchronous activities alone might not suffice to create a community in virtual flipped classrooms. The design and execution of asynchronous activities should coincide with the CoI framework to maximise the probability of instilling a community sense among students.

Available literature insinuates that synchronous sessions in virtual flipped classrooms can play a decisive role in fostering teaching and cognitive presence. For instance, synchronous sessions' real-time interactions between students and instructors enhance active engagement with course material, thereby facilitating meaning construction (Khan et al. 2022; Lee et al. 2022; Shoepe et al. 2020). Studies also indicate synchronous sessions can bolster social presence, enabling face-to-face student-instructor interactions (Conklin and Dikkers 2021; Kennedy and Do 2020). These contribute to a sense of belonging and student engagement, which is essential for forming a CoI. Nevertheless,

synchronous sessions can present technical difficulties and a lack of flexibility, potentially undermining students' sense of belonging and engagement.

When considering theoretical frameworks pertinent to virtual flipped classrooms, Self-Determination Theory (SDT) warrants mention. SDT postulates that autonomy, competence, and relatedness, as innate psychological needs, shape student motivation and engagement (Chiu 2021; Chiu et al. 2022; Wang et al. 2019). Scholarship has indicated the utility of SDT in understanding student engagement in virtual flipped classrooms; asynchronous activities encourage autonomy and self-directed learning, while synchronous sessions foster relatedness and student interactions.

The Technology Acceptance Model (TAM) is another lens through which this study can be viewed, focusing on forming individual perceptions and attitudes towards technology (Salloum et al. 2019). This model posits that perceived usefulness and ease of use fundamentally determine the acceptance and application of technology (Hong et al. 2021; Tao et al. 2022).

Gleaning insights from the literature review, it becomes apparent that the CoI framework offers a tool to comprehend community development in virtual flipped classrooms. Additionally, asynchronous and synchronous sessions foster community and stimulate student engagement in these classrooms. Theoretical scaffolding for understanding student engagement and technology acceptance in virtual flipped classrooms can also be provided by SDT and TAM.

### **3. Methods**

This inquiry probes the link between virtual flipped classrooms and the community of inquiry notion, presenting an argumentative stance facilitated via a theoretical analysis approach. This segment delineates the methodologies and strategies implemented in this exploration.

Core data sources for this exploration include academic articles, books, and other germane literature on the topic. An exhaustive exploration of databases such as Scopus and World of Science yielded pertinent literature. The foundation for theoretical scrutiny is thus formed through the literature review.

The theoretical analysis strategy employed herein involves dissecting prevailing theories and frameworks connected to virtual flipped classrooms and communities of inquiry. The Community of Inquiry framework, Self-Determination Theory, and Technology Acceptance Model are drawn upon to provide a theoretical scaffold for analysis.

Critical evaluation of the literature forms the basis of the analysis, with a view to unearthing gaps, contradictions, and inconsistencies within extant theories and frameworks concerning virtual flipped classrooms and communities of inquiry. The analysis endeavours to amalgamate these theories and frameworks and offer a renewed comprehension of the relation between virtual flipped classrooms and community of inquiry.

The contentious character of this investigation is manifest in its analysis, proffering a convincing case for employing asynchronous sessions to nurture community and engagement among students in virtual flipped classrooms. The analysis also champions the deployment of both asynchronous and synchronous sessions as a balanced approach towards virtual flipped classrooms and bolstering community development among students.

Further, this methodology considers virtual flipped classrooms' technical and technological facets, underscoring the necessity of contemplating students' technical prowess and the quality and accessibility of employed technology. The analysis echoes this perspective, underscoring the imperative of designing user-friendly, navigable asynchronous activities.

To encapsulate, this investigation conducts an all-encompassing analysis of the association between virtual flipped classrooms and the community of inquiry. Emphasising the significance of asynchronous sessions in nurturing community and engagement among students, it argues for a balanced approach using both asynchronous and synchronous sessions. Incorporating an understanding of virtual flipped classrooms' technical and technological aspects, this study contributes to the educational sphere by presenting a renewed understanding of the interplay between virtual flipped classrooms and community inquiry.

#### **4. Results and Discussion**

Asynchronous sessions have become increasingly popular in virtual flipped classrooms due to their flexibility and ability to promote student-centred learning (Islam et al. 2022). Asynchronous activities such as online discussions, peer review, and other collaborative activities provide opportunities for students to actively engage with course material and promote a sense of belonging and engagement among students (Koszalka et al. 2021).

Moreover, asynchronous sessions allow students with busy schedules or those in different time zones to access course content and participate in activities conveniently (Serdyukov 2020). These sessions can promote autonomy and self-directed learning, increasing students' motivation and engagement, as per the Self-Determination Theory (SDT).

However, the success of asynchronous sessions in fostering a sense of community and engagement among students depends on how well the sessions are designed and implemented. The design and implementation of asynchronous activities should be aligned with the Community of Inquiry (CoI) framework to optimise the chances of fostering a sense of community among students. The CoI framework posits that students' sense of belonging and engagement is critical for developing a community of inquiry (Kormos et al. 2023). In addition, synchronous sessions can significantly promote teaching, cognitive, and social presence, all essential components of the CoI framework. Synchronous sessions allow real-time interactions between students and instructors, facilitating active engagement with course content and constructing meaning (Hoffman 2019).

However, synchronous sessions can pose challenges, such as technical difficulties and lack of flexibility, which may negatively impact students' sense of belonging and engagement (Conrad et al. 2022). The design and implementation of synchronous sessions should consider students' technical skills and abilities and the quality and accessibility of the technology used.

Synchronous sessions are an essential component of virtual flipped classrooms, as they provide opportunities for real-time interactions between students and instructors and can promote active engagement with course content (Kay and Pasarica 2019). However, synchronous sessions also present challenges that may affect students' sense of belonging and engagement. Technical difficulties are common in synchronous sessions (Zydney et al. 2020). These may arise due to poor connectivity, inadequate hardware, or other technical issues. Technical difficulties can disrupt the session flow and create frustration among students, leading to disengagement.

A lack of flexibility is another challenge associated with synchronous sessions (Parrish et al. 2021). Synchronous sessions require students to be online at a specific time, which can be difficult for students with other commitments, such as work or family responsibilities (Shrestha et al. 2022). This lack of flexibility may prevent some students from participating in the session, reducing their sense of belonging and engagement in the course. To address these challenges, the design and implementation of synchronous sessions should be carefully planned and executed. This includes considering students' technical skills and abilities and the quality and accessibility of the technology used. In addition, instructors should provide clear and concise instructions on accessing and participating in synchronous sessions and be available to provide technical support during the session if needed (Lapitan Jr et al. 2021). This can help minimise technical difficulties and ensure a smooth session flow.

To increase flexibility and accommodate students with different schedules and commitments, instructors can also consider recording the synchronous session and making it available for later viewing (McWatt 2021). This can allow students to participate in the session more conveniently without sacrificing their sense of belonging and engagement in the course. In conclusion, while synchronous sessions present specific challenges in virtual flipped classrooms, they remain essential in promoting student engagement and a sense of community. Careful planning and implementation can help minimise technical difficulties and increase flexibility, ensuring students feel supported and engaged throughout the course.

Therefore, a balanced approach utilising both asynchronous and synchronous sessions in virtual flipped classrooms can enhance the development of a sense of community among students. Both types of sessions can provide opportunities for student-centred learning, real-time interactions, active engagement with course content, formative and summative assessment, personalisation and differentiation, and meeting students' diverse needs and learning

styles. However, both asynchronous and synchronous sessions should be aligned with the CoI framework and the SDT to optimise the chances of fostering a sense of community and engagement among students.

In advancing the development of communal sentiment among students, an equilibrium strategy that utilises both asynchronous and synchronous sessions within the virtual flipped classroom framework could be influential. Asynchronous encounters afford flexibility and encourage deep engagement with curricular material, while synchronous interactions promote real-time interplay, instigating heightened interaction with educators and peers. Both sessions provide a platform for formative and summative evaluations, personalised instruction, and differentiation and can accommodate diverse learner needs and pedagogical styles.

Nevertheless, optimising the effectiveness of these sessions in nurturing communal sentiments and engagement necessitates thoughtful deliberation in the design and implementation process. Asynchronous session designs should harmonise with the Community of Inquiry (CoI) framework and Self-Determination Theory (SDT), championing student-centric learning whilst fostering belongingness and pupil involvement. Correspondingly, synchronous sessions should be crafted to enhance teaching, cognitive, and social presence.

Furthermore, technological application in virtual flipped classrooms significantly influences the efficacy of both asynchronous and synchronous encounters. Perceptions of utility and ease of usage emerge as pivotal factors shaping the acceptance and deployment of technological tools. Therefore, consideration of students' technical capabilities, along with the quality and accessibility of the technology utilised, is paramount to augment student engagement and acceptance of the technology.

Another critical element is the time and effort required to design and implement both session forms. Both asynchronous and synchronous sessions may necessitate additional resources and support to bolster their effectiveness in fostering community engagement. Educators must weigh the investment in time and effort necessary for the effective development and execution of these sessions.

To encapsulate, employing a balanced approach utilising both asynchronous and synchronous sessions in virtual flipped classrooms can heighten the development of communal sentiments among students. However, the design and implementation of these sessions should harmonise with the CoI framework and SDT, and considerations should be made for students' technical skills, accessibility of technology, and the quality of tools used. Further, educators need to factor in the investment in time and effort necessary for the effective design and execution of these sessions.

Crafting asynchronous activities within the virtual flipped classroom paradigm demands careful deliberation to cultivate a sense of community and engagement among students. The appeal of asynchronous sessions within virtual flipped classrooms is growing, primarily due to their flexibility and propensity to foster student-centred learning. However, relying solely on asynchronous sessions might not suffice in developing a sense of community among learners. Designing and executing asynchronous activities should resonate with the CoI framework and SDT, advocating for autonomous, self-directed learning whilst boosting learner motivation and engagement.

Asynchronous activities within virtual flipped classrooms foster student-centric learning and active engagement with course content. Online discussions, peer review, and other collaborative activities allow students to take control of their learning and engage actively with the course content. These activities also afford opportunities for exchanging ideas and viewpoints, contributing to a sense of belonging and engagement.

The SDT posits that intrinsic psychological needs - autonomy, competence, and relatedness - influence learners' motivation and engagement. Asynchronous activities stimulate autonomy and self-guided learning, thus enhancing learner motivation and engagement. Consequently, designing and implementing asynchronous activities within virtual flipped classrooms should align with SDT to bolster learner motivation and engagement.

The CoI framework proposes that nurturing a sense of belonging and engagement among learners is critical for developing a community of inquiry. Hence, the design and implementation of asynchronous activities should also align with the CoI framework. Crafting asynchronous activities should provide opportunities for active engagement with course content, collaboration with peers, and receiving feedback and support from educators. Asynchronous

activities are pivotal in fostering learner community by stimulating active engagement, fostering collaboration, and nurturing social presence.

Asynchronous activities can foster community and learner engagement in virtual flipped classrooms. However, designing and executing asynchronous activities should align with the CoI framework and SDT to foster autonomous, self-guided learning and enhance learner motivation and engagement. Asynchronous activities provide platforms for learner-centric learning and active engagement with course content, thus playing a crucial role in the efficacy of virtual flipped classrooms.

Synchronous sessions in virtual flipped classrooms also have a significant role in promoting teaching, cognitive, and social presence. Synchronous sessions provide real-time interactions between learners and educators, facilitating active engagement with course content and promoting the construction of meaning. Real-time interactions between learners and educators enhance the development of teaching presence, cognitive presence, and social presence within virtual flipped classrooms.

Teaching presence is the degree to which educators design and facilitate learning activities to stimulate learning. Synchronous sessions enable educators to provide instant feedback and support, thus amplifying teaching presence. Educators can use synchronous sessions to elucidate complex concepts, ensuring comprehension of course material. Cognitive presence pertains to learners constructing meaning and actively engaging with course content. Synchronous sessions enable learners to actively engage in discussions, ask questions, and collaborate with peers, thus enhancing cognitive presence and promoting learner-centric learning. Social presence pertains to the degree to which learners feel connected and engaged with their peers and educators. Synchronous sessions offer face-to-face interactions, fostering a sense of community among learners. These interactions can bolster social presence and promote learner engagement and a sense of belonging.

Nevertheless, synchronous sessions can pose technical difficulties and flexibility issues. These challenges can negatively impact learner engagement and sense of belonging. Hence, the design and implementation of synchronous sessions should account for learners' technical skills and abilities and the quality and accessibility of the technology utilised. To summarise, synchronous sessions within virtual flipped classrooms can significantly promote teaching presence, cognitive presence, and social presence. Synchronous sessions can provide immediate feedback and support opportunities, active engagement with course content, and face-to-face interactions that foster a sense of community. However, considering technical and technological aspects is essential in designing and implementing synchronous sessions to optimise learner engagement and foster a sense of belonging.

Asynchronous and synchronous sessions can provide a balanced approach to virtual flipped classrooms, cater to learners' diverse needs and learning styles, and enhance the development of communal sentiment among learners. Technology within virtual flipped classrooms should be user-friendly, easy to navigate, and consider learners' technical skills and abilities.

A balanced approach encompassing both asynchronous and synchronous sessions can effectively promote engagement and community among learners within virtual flipped classrooms. Asynchronous activities such as online discussions and peer review can increase learner autonomy and collaboration, creating a heightened sense of belonging and engagement. However, the design and implementation of these activities should resonate with the Community of Inquiry (CoI) framework and the Self-Determination Theory (SDT) to ensure optimal results.

On the other hand, synchronous sessions provide real-time interactions between learners and educators, enabling increased teaching presence, cognitive presence, and social presence. This interaction facilitates active engagement with course content, promotes the construction of meaning, and ultimately enriches the student's learning experience. However, synchronous sessions can pose challenges, such as technical difficulties and a lack of flexibility, which should be accounted for during the design and implementation of these sessions.

Thus, asynchronous and synchronous sessions can provide a balanced approach to virtual flipped classrooms, catering to learners' diverse needs and learning styles. However, the design and implementation of these sessions must align with the CoI framework and the SDT and consider students' technical skills and abilities. Additionally, the use of



technology should be user-friendly and easy to navigate, increasing the perceived usefulness and ease of use, thus leading to greater learner engagement and acceptance of the technology.

The discourse of a theoretical exploration affirms the utility of asynchronous sessions in fostering communal sentiment and engagement within the students' cohort in a virtual flipped classroom environment. Active student involvement in course material via asynchronous activities facilitates a collective sense and promotes engagement.

Gradually, asynchronous sessions, known for their adaptability and potential to stimulate learner-centric education, have carved a niche in virtual flipped classrooms. As the Community of Inquiry (CoI) framework and Self-Determination Theory (SDT) underpin, these sessions that utilise activities like online discussions and peer reviews augment student motivation and engagement. Aligning asynchronous sessions with the CoI framework and SDT can foster autonomous, self-directed learning and boost student engagement.

However, synchronous sessions, too, have a pivotal role in catalysing student engagement and instilling a sense of community within virtual flipped classrooms. Interactions between learners and instructors in real-time, made possible by synchronous sessions, facilitate active engagement with course material and construct meaning. Moreover, these sessions further enhance cognitive and social presence within the CoI framework.

A harmonious blend of asynchronous and synchronous sessions can catalyse a communal sentiment among students, addressing their varied needs and learning styles. Both session types offer opportunities for personalisation and differentiation, real-time interactions, and formative and summative assessments. Aligning these with the CoI framework and the SDT enhances the likelihood of nurturing community sentiment and student engagement.

Furthermore, the design and deployment of virtual flipped classrooms should consider students' technical skills and abilities, along with the quality and accessibility of the technology used. If the technology is user-friendly and intuitive, it increases student engagement and acceptance, thereby enhancing their learning experiences and outcomes.

Our discourse culminates in the assertion that asynchronous and synchronous sessions, when used in harmony, can provide a balanced approach to virtual flipped classrooms, promoting a community sense and learner-centric pedagogy. Ensuring alignment of technology utilisation with the CoI framework and SDT is essential for optimising student engagement and fostering communal sentiment. Virtual flipped classrooms' design and implementation must consider students' technical abilities and the quality and accessibility of the technology used. This will enhance perceived utility and ease of use, increasing student engagement and increasing technology acceptance.

A theoretical grounding rooted in the CoI framework and SDT provides a sturdy foundation for constructing and integrating asynchronous sessions in virtual flipped classrooms. Synchronous sessions, too, can contribute significantly to the teaching presence, cognitive presence, and social presence, which is pivotal for developing a community sense among students.

Embedding asynchronous activities that align with the CoI framework and SDT principles can enable autonomy and self-guided learning and heighten student motivation and engagement. Simultaneously, synchronous sessions can cultivate community by providing real-time student-instructor interactions, enabling active engagement with course content and promoting meaning construction.

A balanced approach utilising both asynchronous and synchronous sessions can provide a comprehensive strategy for virtual flipped classrooms, nurture a sense of community among students, and cater to diverse needs and learning styles. Creating user-friendly, intuitive technology in virtual flipped classrooms is vital, considering students' technical skills and abilities. Notably, technical skills and technology accessibility significantly determine students' perceived utility and ease of use, impacting student engagement and technology acceptance.

The theoretical foundation provided by the CoI framework and SDT can effectively guide the design and implementation of virtual flipped classrooms, fostering a community sense and student engagement. The alignment of both asynchronous and synchronous sessions with these frameworks can significantly increase the likelihood of fostering community and engagement among students. However, further exploration is needed to unravel the



relationship between virtual flipped classrooms, CoI frameworks, and ways to foster a sense of community and engagement among students.

The design and implementation of asynchronous and synchronous activities must align with the CoI framework, SDT, and Technology Acceptance Model (TAM), promoting learner-centric learning, increasing student motivation and engagement, and enhancing the acceptance and usage of technology. By aligning with these frameworks, educators can stimulate learner-centric learning, enhance student motivation and engagement, and promote technology acceptance and usage within virtual flipped classrooms.

The CoI framework underscores the significance of social, cognitive, and teaching presences in fostering community among students. Asynchronous activities like online discussions and peer review, designed to stimulate these presences, can significantly contribute to a sense of belonging and engagement (Fiock 2020).

The SDT facilitates understanding the importance of autonomy, competence, and relatedness in promoting student motivation and engagement (Adi Badiozaman et al. 2020; Chiu 2021). Asynchronous activities promoting self-guided learning, collaboration, and personalisation can amplify student motivation and engagement. The TAM provides a theoretical base for understanding the factors influencing technology acceptance and use (Granić and Marangunić 2019). The design and implementation of asynchronous and synchronous activities should consider the quality and accessibility of the technology used and students' technical abilities.

In alignment with the CoI framework, SDT, and TAM, educators can design and implement asynchronous and synchronous activities addressing students' diverse needs and learning styles, fostering community, and enhancing student engagement and technology acceptance in virtual flipped classrooms. Asynchronous and synchronous sessions can provide formative and summative assessment, personalisation, and differentiation opportunities, catering to diverse needs and learning styles.

The CoI framework and SDT can guide the design and implementation of both asynchronous and synchronous sessions. These frameworks can help instructors to craft learning experiences promoting autonomy, self-directed learning, and student engagement. Additionally, the Technology Acceptance Model (TAM) can ensure that the design and implementation of technology are user-friendly, accessible, and meets students' needs and preferences.

Both asynchronous and synchronous sessions in virtual flipped classrooms can benefit instructors and students. By aligning these sessions with the CoI framework, SDT, and TAM, instructors can create learning experiences that are engaging, practical, and accessible to all learners. Further research is needed to explore the impact of these different modes of instruction on student outcomes and to identify best practices for their implementation.

The theoretical analysis suggests that using asynchronous and synchronous sessions can provide a balanced approach to virtual flipped classrooms and enhance the development of a sense of community among students. However, it is essential to note that the use of technology should be designed to be user-friendly and easy to navigate. Consider students' technical skills and abilities to optimise the chances of fostering community and engagement among students. Theoretical analysis suggests that a balanced use of both asynchronous and synchronous sessions can cultivate community and student engagement in virtual flipped classrooms. However, this approach requires mindful contemplation of various factors, such as students' technical skills and abilities, the quality and accessibility of technology, and the design and implementation of sessions, aligning them with the CoI framework and SDT.

Asynchronous sessions, providing flexibility and promoting learner-centric learning through activities like online discussions, peer reviews, and collaborative tasks, stimulate a sense of belonging and inspire students to engage with course material actively. Conversely, synchronous sessions enable real-time interactions between students and instructors, facilitating active engagement with course content and meaning construction.

Designing and implementing asynchronous and synchronous activities must consider students' diverse needs and learning styles and provide formative and summative assessments, personalisation, and differentiation opportunities.

Both asynchronous and synchronous sessions should align with the CoI framework, SDT, and TAM, maximising the chances of fostering community and engagement among students.

The application of technology in virtual flipped classrooms should be designed to be user-friendly, easy to navigate and consider students' technical skills and abilities. This ensures seamless student interaction with course material, which can lead to enhanced student engagement and acceptance of the technology. However, it is essential to note that further research is needed to probe the relationship between virtual flipped classrooms and the Community of Inquiry framework and ways to foster a sense of community and engagement among students within virtual flipped classrooms.

## **5. Conclusion**

To recapitulate, the crux of our investigation elucidates that asynchronous sessions wield the potential to cultivate both a sense of community and an enhanced level of student engagement within the context of virtual flipped classrooms. Furthermore, when the design and execution of these asynchronous learning activities are informed by the Community of Inquiry (CoI) framework and the Self-Determination Theory (SDT), the likelihood of cultivating an engaged, cohesive student community is amplified. Conversely, synchronous sessions pave the way for the nurturance of teaching, cognitive, and social presences - integral components of the CoI framework.

By judiciously weaving together asynchronous and synchronous learning opportunities, one can strike a balanced chord in the orchestration of virtual flipped classrooms, thereby fostering a thriving academic community among students. A cognisance of the student's technical proficiency and the accessibility and quality of the technological resources employed can enhance students' perception of the technology's utility and ease of use, a factor instrumental in augmenting student engagement and receptiveness towards technology.

These insights shed light on the profound impact these factors can have on the field of education, accentuating the necessity for designs of virtual flipped classrooms that are in congruence with the CoI framework and SDT to maximise student engagement and foster a dynamic learning community. Moreover, it underscores the pivotal role of technological considerations in successfully implementing virtual flipped classrooms, given their implications on student engagement and technology acceptance.

Our study's ramifications enrich our understanding of the interplay between virtual flipped classrooms and the CoI concept. The findings gleaned may aid educators in the design and execution of virtual flipped classrooms, thereby enhancing the overall student learning experience and outcomes. Nevertheless, a call for further exploration of the nexus between virtual flipped classrooms, the CoI framework, and strategies to nurture a sense of community and engagement amongst students in a virtual flipped classroom setting remains imperative.

## **References**

- Adi Badiozaman, I. F. binti, Leong, H., and Jikus, O., Investigating student engagement in Malaysian higher education: A self-determination theory approach, *Journal of Further and Higher Education*, vol. 44, no. 10, pp. 1364–1378, 2020.
- Al-Amrani, S. N., and Harrington, M., The impact of online social presence on Omani female students' willingness to communicate in English, *Computer-Assisted Language Learning Electronic Journal*, vol. 21, no. 2, pp. 220–237, 2020.
- Alamri, H. A., Alamri, H., Watson, S. L., and Watson, W. R., Learning Technology Models That Support Personalization within Blended Learning Environments in Higher Education, *Techtrends*, vol. 65, no. 1, pp. 62–78, 2021.
- Antonio, R. L. B., Assessing flipped classroom in flexible learning via Community of Inquiry framework, *ETERNAL (English, Teaching, Learning, and Research Journal)*, vol. 8, no. 1, pp. 94–107, 2022.
- Cakiroglu, U., Community of inquiry in web conferencing: Relationships between cognitive presence and academic achievements, *Open Praxis*, vol. 11, no. 3, pp. 243–260, 2019.
- Chen, L.-T., and Liu, L., Social presence in multidimensional online discussion: The roles of group size and requirements for discussions, *Computers in the Schools*, vol. 37, no. 2, pp. 116–140, 2020.
- Chen, R. H., Effects of deliberate practice on blended learning sustainability: A community of inquiry perspective, *Sustainability*, vol. 14, no. 3, pp. 1785, 2022.

- Chiu, T. K., Student engagement in K-12 online learning amid COVID-19: A qualitative approach from a self-determination theory perspective, *Interactive Learning Environments*, pp. 1–14, 2021.
- Chiu, T. K., Sun, J. C.-Y., and Ismailov, M., Investigating the relationship of technology learning support to digital literacy from the perspective of self-determination theory, *Educational Psychology*, vol. 42, no. 10, pp. 1263–1282, 2022.
- Cleveland-Innes, M., The community of inquiry theoretical framework: Designing collaborative online and blended learning, In *Rethinking pedagogy for a digital age* (pp. 85–102), Routledge, 2019.
- Conklin, S., and Dikkers, A. G., Instructor social presence and connectedness in a quick shift from face-to-face to online instruction. *Online Learning*, vol. 25, no. 1, pp. 135–150, 2021.
- Conrad, C., Deng, Q., Caron, I., Shkurska, O., Skerrett, P., and Sundararajan, B., How student perceptions about online learning difficulty influenced their satisfaction during Canada's Covid-19 response. *British Journal of Educational Technology*, vol. 53, no. 3, pp. 534–557, 2022.
- Debbağ, M., and Yıldız, S., Effect of the flipped classroom model on academic achievement and motivation in teacher education. *Education and Information Technologies*, vol. 26, no. 3, pp. 3057–3076, 2021.
- Delello, J. A., McWhorter, R. R., and Lawrence, H., Fostering a community of inquiry in online discussions. *Academic Exchange Quarterly*, vol. 23, no. 1, pp. 51–57, 2019.
- Dempsey, P. R., and Zhang, J., Re-examining the construct validity and causal relationships of teaching, cognitive, and social presence in Community of Inquiry framework. *Online Learning*, vol. 23, no. 1, pp. 62–79, 2019.
- Fiock, H. (2020). Designing a community of inquiry in online courses. *The International Review of Research in Open and Distributed Learning*, 21(1), 135–153, 2020.
- Garrison, D. R., Shared Metacognition in a Community of Inquiry, *Online Learning*, vol. 26, no. 1, pp. 6–18, 2022.
- Goh, L. H., The gathering of the community of inquiry in online learning, *International Journal of Information and Education Technology*, vol. 10, no. 7, pp. 494–499, 2020.
- Gopalan, C., Butts-Wilmsmeyer, C., and Moran, V. (2021). Virtual flipped teaching during the COVID-19 pandemic. *Advances in Physiology Education*, 45(4), 670–678. <https://doi.org/10.1152/advan.00061.2021>
- Granić, A., and Marangunić, N., Technology acceptance model in educational context: A systematic literature review, *British Journal of Educational Technology*, vol. 50, no. 5, pp. 2572–2593, 2019.
- Guo, C., Shea, P., and Chen, X., Investigation on graduate students' social presence and social knowledge construction in two online discussion settings, *Education and Information Technologies*, vol. 27, no. 2, pp. 2751–2769, 2022.
- Hew, K. F., Jia, C., Gonda, D. E., and Bai, S., Transitioning to the "new normal" of learning in unpredictable times: Pedagogical practices and learning performance in fully online flipped classrooms, *International Journal of Educational Technology in Higher Education*, vol. 17, pp. 1–22, 2020.
- Hoffman, E., The centrality of teaching presence: Using multiple modes to facilitate collaborative active engagement in a synchronous teacher online learning community, *Journal of Interactive Learning Research*, vol. 30, no. 2, pp. 107–145, 2019.
- Hong, X., Zhang, M., and Liu, Q., Preschool teachers' technology acceptance during the COVID-19: An adapted technology acceptance model, *Frontiers in Psychology*, vol. 12, pp. 691492, 2021.
- Humrickhouse, E., Flipped classroom pedagogy in an online learning environment: A self-regulated introduction to information literacy threshold concepts, *The Journal of Academic Librarianship*, vol. 47, no. 2, pp. 102327, 2021.
- Islam, M. K., Sarker, M. F. H., and Islam, M. S., Promoting student-centred blended learning in higher education: A model, *E-Learning and Digital Media*, vol. 19, no. 1, pp. 36–54, 2022.
- Ismail, S. S., and Abdulla, S. A., Virtual flipped classroom: New teaching model to grant the learners knowledge and motivation. *Journal of Technology and Science Education*, vol. 9, no. 2, pp. 168–183, 2019.
- Kay, D., and Pasarica, M., Using technology to increase student (and faculty satisfaction with) engagement in medical education, *Advances in Physiology Education*, vol. 43, no. 3, pp. 408–413, 2019.
- Kennedy, H. R., and Do, K. A., Synchronous videoconferencing: Social presence and the engagement of different learners in a blended family studies course, *Family Science Review*, vol. 24, no. 1, pp. 43–65, 2020.
- Khan, R. A., Atta, K., Sajjad, M., and Jawaid, M., Twelve tips to enhance student engagement in synchronous online teaching and learning, *Medical Teacher*, vol. 44, no. 6, pp. 601–606, 2022.
- Kilis, S., and Yildirim, Z., Posting patterns of students' social presence, cognitive presence, and teaching presence in online learning, *Online Learning*, vol. 23, no. 2, 2019.
- Kim, G., and Gurvitch, R., Online education research adopting the community of inquiry framework: A systematic review, *Quest*, vol. 72, no. 4, pp. 395–409, 2020.

- Kormos, E., Julio, L., and Morgan, A., Preservice Teacher Perceptions of Using Video Discussions to Foster a Community of Inquiry—Does the Learning Environment Matter?, *TechTrends*, pp. 1–11, 2023.
- Koszalka, T. A., Pavlov, Y., and Wu, Y., The informed use of pre-work activities in collaborative asynchronous online discussions: The exploration of idea exchange, content focus, and deep learning, *Computers and Education*, vol. 161, pp. 104067, 2021.
- Lapitan Jr, L. D., Tiangco, C. E., Sumalinog, D. A. G., Sabarillo, N. S., and Diaz, J. M., An effective blended online teaching and learning strategy during the COVID-19 pandemic, *Education for Chemical Engineers*, vol. 35, pp. 116–131, 2021.
- Lee, Y.-J., Davis, R., and Li, Y., Implementing Synchronous Online Flipped Learning for Pre-Service Teachers during COVID-19, *European Journal of Educational Research*, vol. 11, no. 2, pp. 653–661, 2022.
- Marshall, H. W., and Kostka, I., Fostering Teaching Presence through the Synchronous Online Flipped Learning Approach, *Tesl-Ej*, vol. 24, no. 2, n2, 2020.
- Martin, F., Wu, T., Wan, L., and Xie, K., A Meta-Analysis on the Community of Inquiry Presences and Learning Outcomes in Online and Blended Learning Environments, *Online Learning*, vol. 26, no. 1, pp. 325–359, 2022.
- Martínez-Jiménez, R., and Ruiz-Jiménez, M. C., Improving students' satisfaction and learning performance using flipped classroom, *The International Journal of Management Education*, vol. 18, no. 3, pp. 100422, 2020.
- McWatt, S. C., Responding to Covid-19: A thematic analysis of students' perspectives on modified learning activities during an emergency transition to remote human anatomy education, *Anatomical Sciences Education*, vol. 14, no. 6, pp. 721–738, 2021.
- Moore, R. L., and Miller, C. N., Fostering Cognitive Presence in Online Courses: A Systematic Review (2008-2020), *Online Learning*, vol. 26, no. 1, pp. 130–149, 2022.
- Nasir, M. K. M., and Ngah, A. H., The Sustainability of a Community of Inquiry in Online Course Satisfaction in Virtual Learning Environments in Higher Education, *Sustainability*, vol. 14, no. 15, pp. 9633, 2022.
- Nolan-Grant, C. R., The Community of Inquiry framework as learning design model: A case study in postgraduate online education, *Research in Learning Technology*, vol. 27, 2019.
- Parrish, C. W., Williams, D. S., and Estis, J. M., Integrated online team-based learning: Using synchronous engagement and asynchronous flexibility to implement TBL online, *New Directions for Teaching and Learning*, vol. 2021, no. 165, pp. 91–105, 2021.
- Patwardhan, V., Rao, S., and Prabhu, N., Community of Inquiry (CoI) framework and course design as predictors of satisfaction in emergency remote teaching: Perspectives of hospitality management students, *Journal of E-Learning and Knowledge Society*, vol. 16, no. 4, pp. 94–103, 2020.
- Phillips, C., and O'Flaherty, J., Evaluating nursing students' engagement in an online course using flipped virtual classrooms, *Student Success*, vol. 10, no. 1, pp. 59–72, 2019.
- Rehman, R., and Fatima, S. S., An innovation in Flipped Class Room: A teaching model to facilitate synchronous and asynchronous learning during a pandemic, *Pakistan Journal of Medical Sciences*, vol. 37, no. 1, pp. 131, 2021.
- Salloum, S. A., Alhamad, A. Q. M., Al-Emran, M., Monem, A. A., and Shaalan, K., Exploring students' acceptance of e-learning through the development of a comprehensive technology acceptance model, *IEEE Access*, vol. 7, pp. 128445–128462, 2019.
- Serdyukov, P., Asynchronous/synchronous learning chasm, In *Exploring online learning through synchronous and asynchronous instructional methods* (pp. 1–33), IGI Global, 2020.
- Shea, P., and Bidjerano, T., Community of inquiry as a theoretical framework to foster "epistemic engagement" and "cognitive presence" in online education, *Computers and Education*, vol. 52, no. 3, pp. 543–553, 2009.
- Shoepe, T. C., McManus, J. F., August, S. E., Mattos, N. L., Vollucci, T. C., and Sparks, P. R., Instructor prompts and student engagement in synchronous online nutrition classes, *American Journal of Distance Education*, vol. 34, no. 3, pp. 194–210, 2020.
- Shrestha, S., Gnawali, L., and Laudari, S., Issues of participant retention in an online course for English as a foreign language teachers, *International Journal of Research in English Education*, vol. 7, no. 1, pp. 86–98, 2022.
- Singh, J., Singh, L., and Matthees, B., Establishing social, cognitive, and teaching presence in online learning—A panacea in COVID-19 pandemic, post vaccine and post pandemic times, *Journal of Educational Technology Systems*, vol. 51, no. 1, pp. 28–45, 2022.
- Swan, K., Chen, C.-C., and Bockmier-Sommers, D. K., Relationships Between Carl Rogers' Person-Centered Education and the Community of Inquiry Framework: A Preliminary Exploration, *Online Learning*, vol. 24, no. 3, pp. 4–18, 2020.
- Tao, D., Fu, P., Wang, Y., Zhang, T., and Qu, X., Key characteristics in designing massive open online courses (MOOCs) for user acceptance: An application of the extended technology acceptance model, *Interactive Learning Environments*, vol. 30, no. 5, pp. 882–895, 2022.

- Van Wart, M., Ni, A., Rose, L., McWeeney, T., and Worrell, R., A literature review and model of online teaching effectiveness integrating concerns for learning achievement, student satisfaction, faculty satisfaction, and institutional results, *Pan-Pacific Journal of Business Research*, vol. 10, no. 1, pp. 1–22, 2019.
- Wang, C. J., Liu, W. C., Kee, Y. H., and Chian, L. K., Competence, autonomy, and relatedness in the classroom: Understanding students' motivational processes using the self-determination theory, *Heliyon*, vol. 5, no. 7, e01983, 2019.
- Wang, Y., and Liu, Q., Effects of online teaching presence on students' interactions and collaborative knowledge construction, *Journal of Computer Assisted Learning*, vol. 36, no. 3, pp. 370–382, 2020.
- Wut, T., and Xu, J., Person-to-person interactions in online classroom settings under the impact of COVID-19: A social presence theory perspective, *Asia Pacific Education Review*, vol. 22, no. 3, pp. 371–383, 2021.
- Yandra, F. P., Alsolami, B., Sopacua, I. O., and Prajogo, W., The role of community of inquiry and self-efficacy on accounting students' satisfaction in online learning environment, *Jurnal Siasat Bisnis*, pp. 1–16, 2021.
- Zhang, Y., Tian, Y., Yao, L., Duan, C., Sun, X., and Niu, G., Teaching presence predicts cyberloafing during online learning: From the perspective of the community of inquiry framework and social learning theory, *British Journal of Educational Psychology*, vol. 92, no. 4, pp. 1651–1666, 2022.
- Zydney, J. M., Warner, Z., and Angelone, L., Learning through experience: Using design based research to redesign protocols for blended synchronous learning environments, *Computers and Education*, vol. 143, pp. 103678, 2020.

### **Biography**

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