Adaptation of an Activity Theory Framework for Effective Online Learning Experiences: Bringing Cognitive Presence, Teaching Presence, and Social Presence to Online Courses

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Abstract
Offering online courses can be seen as a way of enhancing the three essential "presences" (teaching, cognitive, and social) of the Community of Inquiry (CoI) model. Creating and enhancing cognitive, teaching, and social presences require an innovation for teachers during planning, implementing, and evaluating their online courses. As teachers develop their own expertise in teaching online, they contribute to the enhancement of cognitive, teaching, and social presences for effective online learning. The present conceptual study provides a review of the models presented previously and develops a complete model for effective online learning experience by adapting the Activity Theory within the context of online learning management. The study discusses a framework developed to adapt the Activity Theory for the design, development, implementation, and evaluation of online courses to enhance the cognitive, teaching, and social presences within complex cognitive tasks so that the learning outcomes of the course, as well as the required qualifications of higher education, can be reached.

Keywords: Designing online course, activity theory, models for online learning, community of inquiry.

While shifting to digital learning environments, it becomes vital to support teachers for adapting their teaching to online platforms and appropriate teaching and assessment techniques. This became evident during the Covid-19 pandemic in early 2020. Dhawan (2020) conducted a study about the importance of online learning and the Strengths, Weaknesses, Opportunities, & Challenges (SWOC) analysis of e-learning models in the time of crisis. The digital transformations of teaching and learning are faced with several challenges. These challenges include the lack of teaching experiences, the use of technology skills, time constraints to plan for the accompanying changes, and issues to enhance effective online learning environments (Adedoyin & Soykan, 2020; Dhawan, 2020; Gogus, 2021; Yakubu & Dasuki, 2021). It is challenging to develop content which not only covers the course plan but also involves students (Dhawan, 2020; Kebritchi, et al., 2017). Enhancing effective learning environments requires the use of well-developed models for online learning environments. Online learning is not about accessing information but, rather, about learning via online courses by active and collaborative engagement in exploring, creating meaning, and confirming understanding. Therefore, to enhance effective learning, creating collaborative communities of inquiry in online learning environments is required, as suggested in Garrison, et al. (2000). According to Garrison (2009):

> A community of inquiry goes beyond accessing information and focuses on the elements of an educational experience that facilitates the creation of communities of learners actively and collaboratively engaged in exploring, creating meaning, and confirming understanding (i.e., inquiry). Constructing knowledge through discourse and shared understanding requires more than disseminating information either through a study package or lecturing. It requires a commitment to and participation in a community of learners that will support critical reflection and collaborative engagement. (Garrison, 2009, p.352)

Offering online courses can be seen as a new way to enhance cognitive presence, teaching presence, and social presence. Rogers (1983) defines an innovation as an idea, practice, or object perceived as new by an individual. Individual teachers may pass through a technology adoption process whereby teachers progress through various stages as they integrate technology into their instruction (Gogus, 2005; 2008; 2021). Rogers (1983) defines diffusion as a process that individuals pass through over time in the stage of knowledge, persuasion, decision, implementation, and confirmation in the innovation-decision process. Rogers' (1983; 2003) model of stages in the innovation-decision process helps us to understand the evolution of teachers' decision-making process as they develop expertise on teaching online courses.

Those three presences are embodied in the Community of Inquiry (CoI) model for online learning environments, developed by Garrison et al. (2000), reflecting a collaborative-constructivist approach to learning. Providing an effective online course requires bringing a cognitive presence into class to construct meaning through sustained communication (Garrison, et al., 2001). Garrison, et al. (2001) define cognitive presence as "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry" (p. 11). While adapting to teaching online, teachers can develop expertise to facilitate higher levels of learning in synchronous courses and asynchronous text-based discussion tools to enhance cognitive presence (i.e., critical, practical inquiry) besides teaching presence and social presence.

On the other hand, activity theory offers a conceptual framework for studying human behavior (Engeström, 1987; Leont'ev, 1978) and, thus, provides a clearer view for examining how to mediate teachers' technology integration practices. An activity system is a means for conceptually defining social and material resources that interact to enable and constrain what individuals and social groups can accomplish (Engeström, et al., 1999; Anthony, 2012). By adapting activity theory to online learning management contexts, the present study aims to present how to design and deliver online courses that enhance cognitive, teaching, and social presences. This study presents a complete activity theory framework, details each part of the Activity theory and shows the puzzle in its complete form. The complete framework gives teachers and educational designers meaningful insight during planning, implementing, and evaluating their online courses. Thus, teachers use the framework to develop their own expertise in teaching online and enhancing cognitive, teaching, and social presences for effective online learning. Also, using the framework allows teachers to improve the processes or the learning outcomes (Shambaugh, 2010; Yakubu & Dasuki, 2021).

Creating and enhancing the cognitive presence, teaching presence, and social presence require an innovation for teachers during planning, implementing, and evaluating their online courses. As teachers develop their own expertise in online teaching, they contribute to the enhancement of the three presences in online learning. The model developed in the present article can guide teachers to implement effective and efficient online learning activities for bringing cognitive, teaching, and social presences into class. This paper contributes to the field of Educational Technology Research and Development by reviewing the online learning models and explaining many complex relations using the following sub-titles to discuss: (1) The importance of online learning and Strengths, Weaknesses, Opportunities, & Challenges (SWOC) analysis of e-learning modes in the time of crisis (Dhawan, 2020); (2) A review of the most relevant models: Connectivism (Siemens, 2005), Online Collaborative Learning (OCL) (Garrison, et al., 2000; Harasim, 2012), Anderson's Online Learning Model (Anderson, 2011), Bosch's Blending with Pedagogical Purpose Model (Bosch, 2016), Picciano's Multimodal Model for Online Education (Picciano, 2017), and Community of Inquiry (CoI) (Garrison, et al., 2000); (3) The importance of the elements of the CoI Framework (Garrison, 2009, p. 353; Martin, et al. 2022; p.340); (4) Specific lesson plan activities as related to the four phases of cognitive presence from McCarroll and Hartwick, (2022), in which the impact of weekly task design and the facilitation of (either synchronous or asynchronous) lesson plans on the learner- and teacher-perception of cognitive presence based on four phases: initial interaction, exploration, integration, and resolution; (5) The steps of a complete framework which activity theory offers for teachers and educational designers to gain meaningful insight for planning, implementing, and evaluating their online courses; (6) The complex tasks within Figure 5 presents Effective Online Learning Experience and Activity Theory Framework that offers a conceptual framework for studying human behavior (Engeström, 1987; 2001; Leont'ev, 1978) and a lens for examining how to mediate teachers' technology integration practices for effective online learning experiences.

The Importance of Online Learning and Strengths, Weaknesses, Opportunities and Challenges (SWOC) Analysis of e-Learning Modes in the Time of Crisis

Online learning is defined as learning experiences in synchronous or asynchronous environments using different devices with internet access by connecting to a course anytime and anywhere (Singh & Thurman, 2019). The issues related to online pedagogy are stated as accessibility, affordability, flexibility, learning pedagogy, life-long learning, and policy. The challenges posed by the COVID-19 pandemic pushed online learning beyond choice and into necessity (Dhawan, 2020). Regarding online learning, a lack of standards seems to pose further challenges for quality, quality control, development of e-resources, e-content delivery, and the quality of online education (Cojocariu, et al., 2014; Dhawan, 2020). Educators should consider developing and enhancing the quality of online courses delivered during crises (Affouneh, et al., 2020). Many academic institutions now seek more effective online learning to improve teaching and learning processes. Dhawan (2020) conducted a study about the importance of online learning and the SWOC analysis of e-learning modes in the time of the crisis, during which online teaching was no more an option but a necessity. Dhawan (2020) presents the SWOC analysis of online learning as in Table 1.

Table 1

The SWOC (Strengths, Weaknesses, Opportunities, & Challenges) Analysis of Online Learning During Such Crises (Dhawan, 2020, p.14)

STRENGTHS	WEAKNESSES
1. Time flexibility	1. Technical difficulties
2. Location flexibility	2. Learner's capability & confidence level
3. Catering to wide audience	3. Time management
4. Wide availability of courses & content	4. Distractions, frustration, anxiety & confusion
5. Immediate feedback	5. Lack of personal/physical attention
OPPORTUNITIES	**CHALLENGES**
1. Scope for innovation & digital development	1. Unequal distribution of ICT infrastructure
2. Designing flexible programs	2. Quality of education
3. Strengthening skills: problem solving, critical thinking, & adaptability	3. Digital literacy
4. Users can be of any age	4. Digital divide
5. An innovative pedagogical approach (radical transformation in all aspects of education)	5. Technology cost & obsolescence

Natural disasters can stimulate educators' motivation for the adoption of highly innovative communication technology and e-learning tools (Ayebi-Arthur, 2017; Dhawan, 2020; Meyer & Wilson, 2011; Tull, et al., 2017). During pandemics, online platforms should allow (a) video conferencing with at least 40 students, (b) discussions with students to keep classes organic, (c) lectures accessible to both mobile phones and laptops, (d) recorded lectures, (e) the capacity to receive instant feedback from students, and (f) the capacity to deliver feedback for assignments (Basilaia, et al., 2020). To enhance effective learning experiences in such challenging times, educators and learners need to focus on more efficient uses of online learning

models. Towards the development of a complete model for effective online learning experiences by adapting activity theory, the present paper reviews previous models for online education below.

A Review of Models for Online Learning

Learning is explained by various learning theories. Among the major learning theories are Behaviorism, Cognitivism, and Social Constructivism. By deriving from major learning theories, several theories present models for the online environment, such as Connectivism (Siemens, 2005), Online Collaborative Learning (OCL) (Garrison, Anderson & Archer, 2000; Harasim, 2012), Anderson's Online Learning Model (Anderson, 2011), Bosch's Blending with Pedagogical Purpose Model (Bosch, 2016), and Picciano's Multimodal Model for Online Education (Picciano, 2017), and the Community of Inquiry (CoI) (Garrison, Anderson & Archer, 2000). The present conceptual study provides a review of the previous models and develops a complete model for effective online learning experiences by adapting activity theory within the context of online learning management.

Connectivism, to start with, emphasizes the effect of internet technologies on the way people communicate and their contribution to how people learn in a digital age (Siemens, 2005). Connectivism is a learning model that sees knowledge as a network and learning as a process of pattern recognition (Siemens, 2006). Connectivism is an integration of the principles related to the chaos, network, complexity, and self-organization theories (Siemens, 2005). Connectivism is particularly appropriate for courses with very high enrollments and where the learning goal or objective is to develop and create knowledge rather than to disseminate it (Picciano, 2017).

Anderson's Online Learning Model (Anderson, 2011) is constructed on the two major human actors—namely, learners and teachers—and their interactions with each other and with content by taking place within a community of inquiry, using a variety of net-based synchronous and asynchronous activities. To construct an online learning model, Anderson (2011) considered several theories and focused on Bransford, Brown, and Cocking's (1999) work (Picciano, 2017) which consists of four overlapping layers for effective learning environments: community-centeredness, knowledge-centeredness, learner-centeredness, and assessment-centeredness. Anderson's Online Learning Model (Anderson, 2011) also emphasizes the structured learning tools associated with independent learning such as computer-assisted tutorials drills, and simulations (Anderson, 2011). Drawing upon the model, Picciano (2017) examines theoretical frameworks and models that focus on the pedagogical aspects of online education by integrating the work of several other major theorists and model builders such as Anderson (2011) and Bosch (2016).

The Blending with Pedagogical Purpose Model developed by Bosch (2016) suggests that blending the objectives, activities, and approaches within multiple modalities might be mostly effective for, and appeal to, a wide range of students. The model contains six basic pedagogical goals, and approaches for achieving them, to form learning modules (Bosch, 2016):

(1) Content is one of the primary drivers of instruction; there are many ways in which content can be delivered and presented via a variety of media, including text, rich digital images, video, audio, and games or simulations.

(2) Social and emotional support should be provided in online learning via face-to-face meetings and the physical presence of an instructor during office hours.

(3) Dialectics or questioning like the Socratic method is an important activity that allows faculty members to probe what students know and to help refine their knowledge via electronic discussion boards or forums such as *VoiceThread* to present a topic or issue and have students respond to questions and provide their own perspectives, while evaluating and responding to the opinions of others.

(4) Reflection can be incorporated as a powerful pedagogical strategy that requires students to reflect on what they learn and to share their reflections with their teachers and fellow students. Reflection can be extended and enriched via blogs and blogging, whether as group exercises or for individual journaling activities, which have evolved into appropriate tools for student reflection and other aspects of course activities.

(5) Collaborative learning is a technique for group problem solving and can be used in online education by eliminating the limitations of the group work such as logistical issues or time conflicts, and the like, via email, mobile technology, other forms of electronic communication, and Wikis that allow students to generate content that can be shared with others.

(6) Evaluation of learning can be conducted electronically via a variety of mechanisms of CMSs/LMSs and other online tools and platforms by using many assessment techniques such as papers, tests, assignments, portfolios, essays, term projects, oral classroom presentations, or weekly class discussions on discussion boards or blogs. These online technologies provide a permanent, accessible record for students and teachers, and allow the use of learning analytics to improve learning and teaching.

The Multimodal Model for Online Education, that describes the phenomenon of pedagogically driven online education, is proposed by Picciano (2017). The model was formed by integrating Anderson's (2011) and Bosch's (2016) models with the inclusion of such new components as "community," "interaction," and "self-paced and independent instruction." In this new model, self-study learning, or independent learning is integrated as a part of instructional delivery via adaptive learning software used primarily in stand-alone mode with teachers available to act as tutors when needed. Picciano (2017) emphasizes that online education has evolved as a subset of learning in general rather than a subset of distance learning (see Figure 1).

Figure 1

Multimodal Model for Online Education (Picciano, 2017, p. 182)
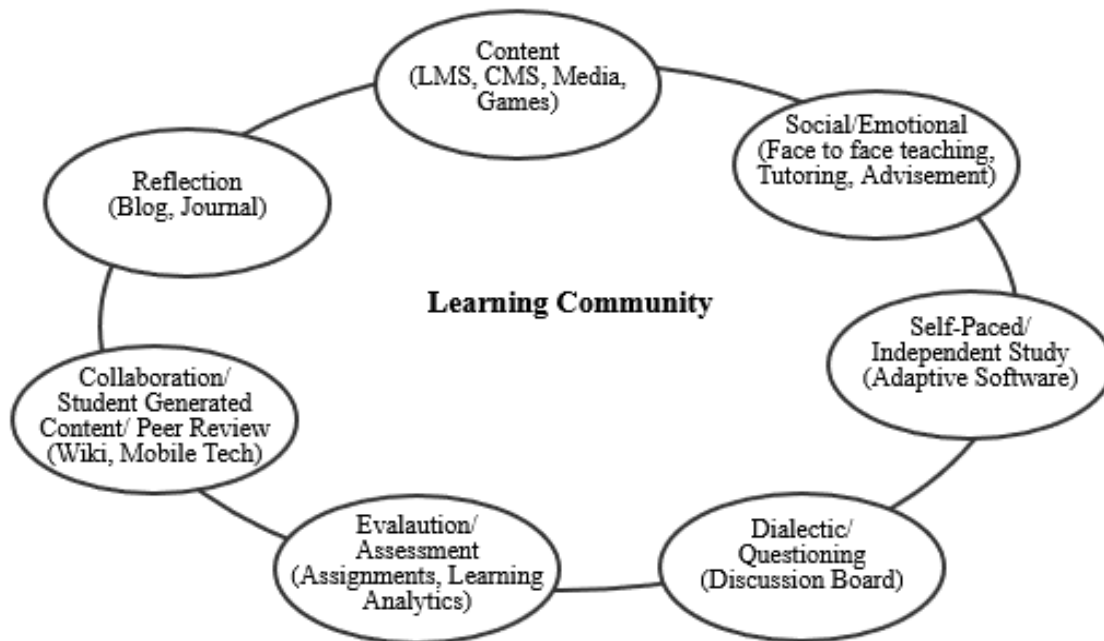
The present conceptual study uses these seven components of the Multimodal Model for Online Education (Picciano, 2017) in the development of a complete model for effective online learning experiences by adapting activity theory in the online learning management context. In so doing, it adopts activity theory, which covers the other most relevant online learning models, namely, Connectivism (Siemens, 2005), Online Collaborative Learning (OCL) (Garrison, Anderson & Archer, 2000; Harasim, 2012), Anderson's Online Learning Model (Anderson, 2011), Bosch's Blending with Pedagogical Purpose Model (Bosch, 2016), and Picciano's Multimodal Model for Online Education (Picciano, 2017). Activity theory is taken as a big umbrella term that can cover the components of other online learning models. In addition, these components can fit the Community of Inquiry model for online learning environments. The present study presents a framework which aims to adapt activity theory to the design, development, implementation, and evaluation of online courses enhancing cognitive presence, teaching presence, and social presence within complex cognitive tasks to reach the learning outcomes of the course as well as the required qualifications of higher education. The concept of presence requires particular attention, because it is highly complex in nature due to the fact that it is the result of the dynamic interplay of thought, emotion, and behavior in the online world (Garrison & Arbaugh, 2007; Harb & Krish, 2020).

Community of Inquiry (CoI) Model for Online Learning Environments

The *Community of Inquiry (CoI)* model for online learning environments, developed by Garrison, Anderson & Archer (2000), is based on the concept of three distinct "presences"; namely, cognitive, social, and teaching (see Figure 2). Garrison (2009) defines CoI as "a framework that reflects a collaborative-constructivist approach to learning," that "fuses individual construction of meaning and collaborative validation of understanding" (p. 355)

through interactions among students and instructors by using discussion boards, blogs, wikis, and videoconferencing in online learning environments.

Figure 2

Community of Inquiry (Garrison, et al., 2000)
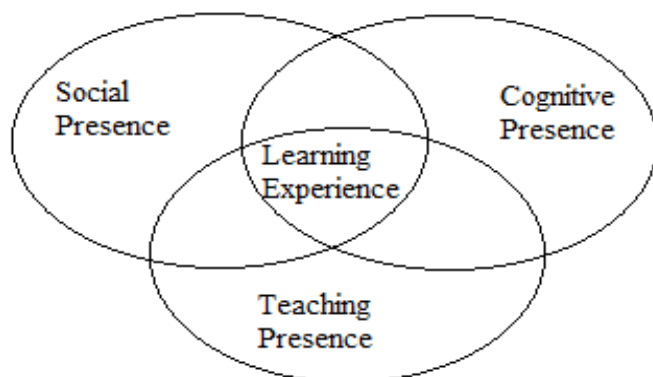
Garrison (2009, p. 355) defines the three presences as (1) *cognitive presence*, the process of practical inquiry distinguished by discourse and reflection for the purpose of constructing meaning and confirming understanding, (2) *social presence,* the ability to identify with a group, communicate purposefully, and develop inter-personal relationships, and (3) *teaching presence,* the design, facilitation and instruction directed toward creating and sustaining a community of inquiry. In the context of CoI, cognitive presence is defined as a research process that involves defining a problem or an issue (initial interaction), conducting a detailed investigation of information related to this issue (exploration), combining ideas to develop a meaningful structure or obtain a solution (integration), and then testing directly or indirectly the usefulness or validity of the solution (resolution) (Garrison, 2006; Olpak, 2022). Social presence, on the other hand, is defined as "the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities" (Garrison, 2009, p. 352). As for teaching presence, Anderson, et al., (2001) defines it as "the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (p. 5). It begins prior to the start of a course (e.g., in the preparation and planning of a subject by an instructor) and continues throughout the course (e.g., instructor facilitating discussions) (Anderson, et al., 2001; Olpak, 2022). Creating and sustaining a CoI requires an understanding of the progressive or developmental nature of each of the presences and how they interact. The elements of the CoI framework can be found in Table 2, designed to combine the "examples for indicators" and "elements of presence" from Garrison (2009) (Garrison, 2009, p. 353; Martin, et al. 2022; p.340).

Table 2

The Elements of the CoI Framework (Garrison, 2009, p. 353; Martin, et al. 2022; p.340)

Presence	Categories	Examples for Indicators	Elements of Presence
Cognitive Presence	• Initial interaction • Exploration • Integration • Resolution	• Sense of puzzlement • Information exchange • Connecting Ideas • Applying new ideas	• Taking notes • Reading in/posting to forums • Each group meeting 3 times a week in virtual space • Provide feedback for group members • Readings, video resources, and assignments by instructors • Students participating in online discussions • Synchronous communication among peers • Synchronous communication among instructors and students • Students working collaboratively on course assignments, studying for exams and quizzes, class presentations, and listening to lectures
Teaching Presence	• Design & Organization • Facilitating • Discourse • Direct Instruction	• Setting curriculum & methods Shaping constructive exchange • Focusing and resolving issues	• Contacting the teacher or teaching assistant • Instructors facilitating live lectures and discussions • Using LMS to host syllabus, content, assignments, and discussion forums • Teachers collaborating with students via email, message boards, • announcements, wikis, blogs and discussions • Establishing curriculum content, learning activities and timelines • Monitoring and managing purposeful collaboration and reflection • Ensuring that the community reaches the intended learning outcomes by diagnosing needs • Providing timely information and direction
Social Presence	• Open Communication • Group Cohesion • Personal /Affective	• Learning climate • Group identity/ collaboration • Self-projection / expressing emotions	• Making friends in forums • Joining social media groups • Groups of 8 to 10 to foster intimate interaction among members • Real-time chat among group members

A recent study by Olpak (2022) examined the research trends related to CoI over the past two decades and stated that the reviewed studies relate mainly to online learning, the CoI, its main elements, and a consideration of the CoI framework from a collaborative-constructivist point of view to understand the online learning experience (Olpak, 2022). Among the recent meta-analysis studies on CoI, Caskurlu, et al., 2020; Martin, et al., 2022; and Richardson, et al. 2017 can be given here. Social presence and teaching presence are studied in Richardson, et al. (2017) and Caskurlu, et al. (2020), respectively; and Martin, et al. (2022) conducted a meta-analysis focusing on the CoI presences (teaching presence, social presence, and cognitive presence) and their correlations with learning outcomes, including actual learning, perceived learning, and satisfaction.
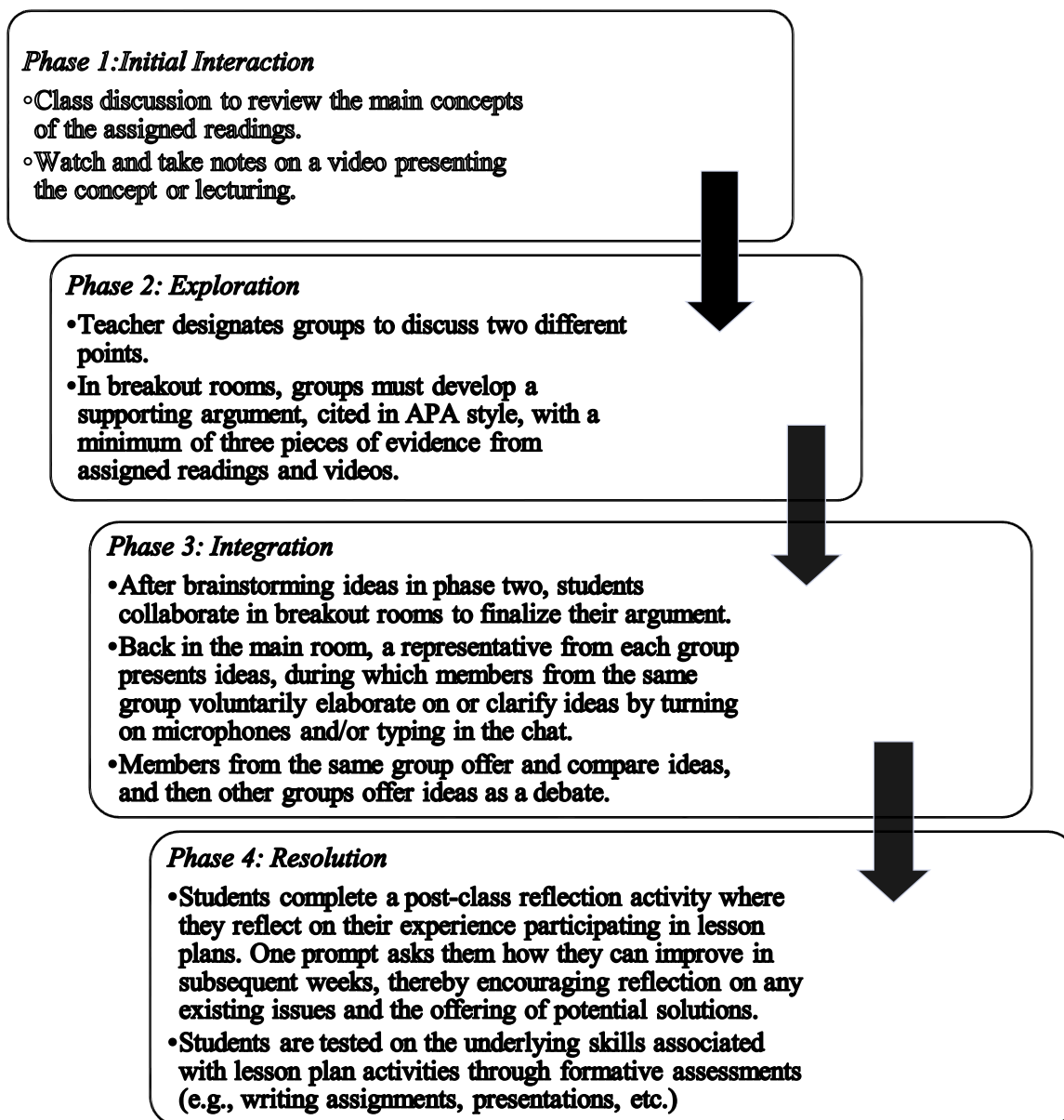
Cognitive presence is the ability of the learners to project their mental and perceptual presence through the process of reflection, discourse, analysis, and synthesis (Harb & Krish, 2020; Garrison, et al., 2001). Cognitive presence, sustained in a community of inquiry, is partly dependent upon how communication is restricted or encouraged by the medium (Garrison, Anderson, & Archer, 2001). Cognitive presence has the potential to assess the quality of critical inquiry in terms of providing a means to assess the systematic progression of thinking over time (Garrison, Anderson, & Archer, 2001). According to Garrison and Anderson (2003), cognitive presence is the process of both reflection and discourse in the initiation, construction, and confirmation of meaningful learning outcomes. Cognitive presence indicates the extent to which students are capable of constructing meaning through a continuous reflection in a critical research community, thus indicating the extent to which the learning objectives are achieved (Garrison & Anderson, 2003; Garrison, Anderson, & Archer, 2001; Harb & Krish, 2020). Akyol and Garrison (2011) emphasize that measuring actual learning outcomes to connect collaborative and engaging approaches of blended and online learning to a depth of learning is critical, and it requires understanding how to support cognitive presence in blended and online learning environments (Akyol & Garrison, 2011).

According to Garrison, et al. (2001), cognitive presence is based on the literature of critical thinking as a necessary condition for learning, and it matches with learning outcomes and the required qualifications in higher education (Garrison, et al. 2000; Harb & Krish, 2020). Critical thinking and inquiry skills can support students' understanding and confirming meaning and their knowledge construction (Akyol & Garrison, 2011; Harb & Krish, 2020; Shea & Bidjerano, 2009). Cognitive presence is considered an essential element of success in higher education since it is a vital element in critical thinking and inquiry (Garrison, et al., 2000; Harb & Krish, 2020).

McCarroll and Hartwick (2022) state that online learning requires new approaches to pedagogy to create rich online learning contexts that stimulate curiosity and the process of inquiry, thereby facilitating cognitive presence and suggest that task design and facilitation play a major role in students' perceived experience of cognitive presence. McCarroll and Hartwick (2022) assess how weekly task design and the facilitation of lesson plans, lessons being either synchronous or asynchronous, impact student and teacher perception of cognitive presence based on the four phases of initial interaction, exploration, integration, and resolution, and they present specific lesson plan activities as related to the four phases of cognitive presence as presented in Figure 3 (McCarroll & Hartwick, 2022, p.90-91).

Figure 3

Lesson Plan Activities as Related to the Four Phases of Cognitive Presence (McCarroll & Hartwick, 2022)

Phase 1:Initial Interaction
- Class discussion to review the main concepts of the assigned readings.
- Watch and take notes on a video presenting the concept or lecturing.

Phase 2: Exploration
- Teacher designates groups to discuss two different points.
- In breakout rooms, groups must develop a supporting argument, cited in APA style, with a minimum of three pieces of evidence from assigned readings and videos.

Phase 3: Integration
- After brainstorming ideas in phase two, students collaborate in breakout rooms to finalize their argument.
- Back in the main room, a representative from each group presents ideas, during which members from the same group voluntarily elaborate on or clarify ideas by turning on microphones and/or typing in the chat.
- Members from the same group offer and compare ideas, and then other groups offer ideas as a debate.

Phase 4: Resolution
- Students complete a post-class reflection activity where they reflect on their experience participating in lesson plans. One prompt asks them how they can improve in subsequent weeks, thereby encouraging reflection on any existing issues and the offering of potential solutions.
- Students are tested on the underlying skills associated with lesson plan activities through formative assessments (e.g., writing assignments, presentations, etc.)

Adaptation of an Activity Theory Framework for Effective Online Learning Experiences

As one of the classical theories of cognition, activity theory (Leont'ev, 1978; Engeström, 1987; Nardi, 1996) is rooted in Vygotsky's cultural-historical psychology and founded by Leont'ev and then extended by Engeström (1987). Vygotsky (1978) pointed out that human beings deeply understand the things around them and acquire knowledge through their meaningful actions, such as collaborative dialogue, interaction, and social activities. Leont'ev (1978) further developed this theory into a conceptual framework to understand human activities as complex, socially situated phenomena. Then, Engeström (1987) extended the ideas of

Leont'ev and Vygotsky to explain how the individual or subgroup adjusts the framework in response to the challenges of the situation changing.

Activity theory has a heuristic approach that can be used to analyze activity systems. Activity theory proposes that people are embedded actors, with learning considered via six elements: subject (e.g., the learner, participants involved in activities), object (the reason of the task or the activity), tools (the content or the instrument), community (the environment in which the activities are carried out), rules (strategies or teaching mode of the activities), and division of labor (the procedures by which the responsibilities are duly distributed) (Engeström, 1987; Leont'ev, 1978; Nardi, 1996). With these six elements, many scholars used activity theory to design learning systems (e.g., Chung, Hwang, & Lai, 2019; Peña-Ayala, et al., 2014; Shambaugh, 2010).

Engeström (2001) emphasizes that activity theory and its concept of expansive learning should be examined with the help of four questions:

(1) Who are the subjects of learning?
(2) Why do they learn?
(3) What do they learn?
(4) How do they learn?

Engeström (2001) presents five central principles of activity theory, namely, the activity system as the unit of analysis, multi-voicedness of the activity, historicity of the activity, contradictions as the driving force of change in the activity, and expansive cycles as possible forms of transformation in the activity. Contradictions constitute a key concept or principle in activity theory (Engeström, 2001) and are "historically accumulating structural tensions within and between activity systems" (Engeström, 2001, p. 137). The Murphy and Rodriguez-Manzanares (2008) study uses activity theory and its principle of contradictions to guide research in educational technology. The study emphasizes that the notion of contradictions as the driving force of change and development in activity systems has been gaining "due status as a guiding principle of empirical research" (Engeström, 2001, p. 135).

Engeström's (2001) defines five principles of activity theory. *Principle 1, a collective, artifact-mediated and object-oriented activity system* is the prime unit of analysis, and all the independent goal-directed operations subordinate the units of analysis. *Principle 2 is the multi-voicedness of the activity systems* that should be the focus of the division of labor in demanding actions of translation and negotiation with a community of multiple points of view, traditions, and interests. *Principle 3 refers to the historicity of the activity systems*, the problems and potentials of activities, ideas, concepts, procedures, and tools employed need to be analyzed and observed to see how they get transformed over lengthy periods of time. *Principle 4 concerns the central role of contradictions as sources of change and the development of the activity, the use value and exchange value of commodities*. Contradictions may not be the same as problems or conflicts, but they can be innovative attempts to change the activity when an activity system adopts a new element, a new technology, or a new object. *Principle 5 points to the possibility of expansive transformations in activity systems*; this happens while moving through relatively long cycles of qualitative transformations and some individual participants begin to question and deviate from its established norms.

Activity theory has been employed in various studies and applications, such as the analysis and design of human-computer interactions (Nardi, 1996), constructivist learning environments (Jonassen & Rohrer-Murphy, 1999), and computer-supported collaborative learning (Zurita & Nussbaum, 2007). Peña-Ayala et al. (2014) apply activity theory to design

adaptive e-learning systems. Chung, et al. (2019) adopt activity theory for mobile learning. Shambaugh (2010) uses an activity theory framework to present a conceptual representation of an activity-in-context, which provides an analysis and synthesis tool to help department faculty begin to develop an online instructional design and technology master's program. Jonassen et al. (1999) suggest six steps while adopting an activity theory framework: (1) Clarify the purpose for the activity, (2) provide a big picture of the overall initiative, (3) specify the activities to be analyzed, (4) examine the role of the tools, (5) address the internal and external contexts, and (6) monitor what is happening and document the progress and the process.

To use the activity theory to design learning systems, it is necessary to respond to the following questions posed by Mwanza and Engeström (2005): (1) For activity, what sort of an activity are you interested in? (2) For tools, by what means are the subjects fulfilling the activity? (3) For subjects, who is involved in achieving the activity? (4) For object, what is the purpose of the activity and why is the activity taking place? (5) For outcomes, what is the specific result to be delivered from the activity? (6) For rules, are there any cultural norms and regulations governing the development of the activity? (7) For community, what is the social environment in which the activity is being accomplished? (8) For division of labor, who are the individuals responsible for what; and, how are those roles organized?

An activity theory framework is suitable to represent the components of online learning experiences in the present article (see Figure 4). Activity theory offers a complete framework that gives scholars a meaningful insight into what the actors do in an activity that produces changes that potentially could improve the processes or outcomes of the activity (Shambaugh, 2010; Yakubu & Dasuki, 2021). Figure 4 (Gogus, 2022) presents the Effective Online Learning Experience and Activity Theory Framework, which offers a conceptual framework for studying human behavior (Engeström, 1987; Leont'ev, 1978) and a lens for examining how to mediate teachers' technology integration practices for effective online learning experiences. An activity system is a means for conceptually bounding social and material resources that interact to enable and constrain what individuals and social groups can accomplish (Engeström, et al., 1999; Anthony, 2012).

As seen in Figure 4 (Gogus, 2022), the conceptual framework, adapted from activity theory, presents the main components of an online learning activity aiming at concrete learning outcomes. The main components include "*context* (e.g. the learners' characteristics, teachers' characteristics, and online learning management systems' functionalities), *the tools and resources used* (e.g. resources for content delivery and learning activities, communication tools between the learners and the teachers or among the learners), *the concrete learning tasks* (e.g. learning activities, teaching techniques, assessment methods), and *the relations between the three* (e.g. how the tools and resources are used, how self-paced/individual the tasks are designed and implemented, and how the learning outcomes are assessed)" (Gogus, 2022, p.59).

Figure 4

Effective Online Learning Experience and Activity Theory Framework (Gogus, 2022)
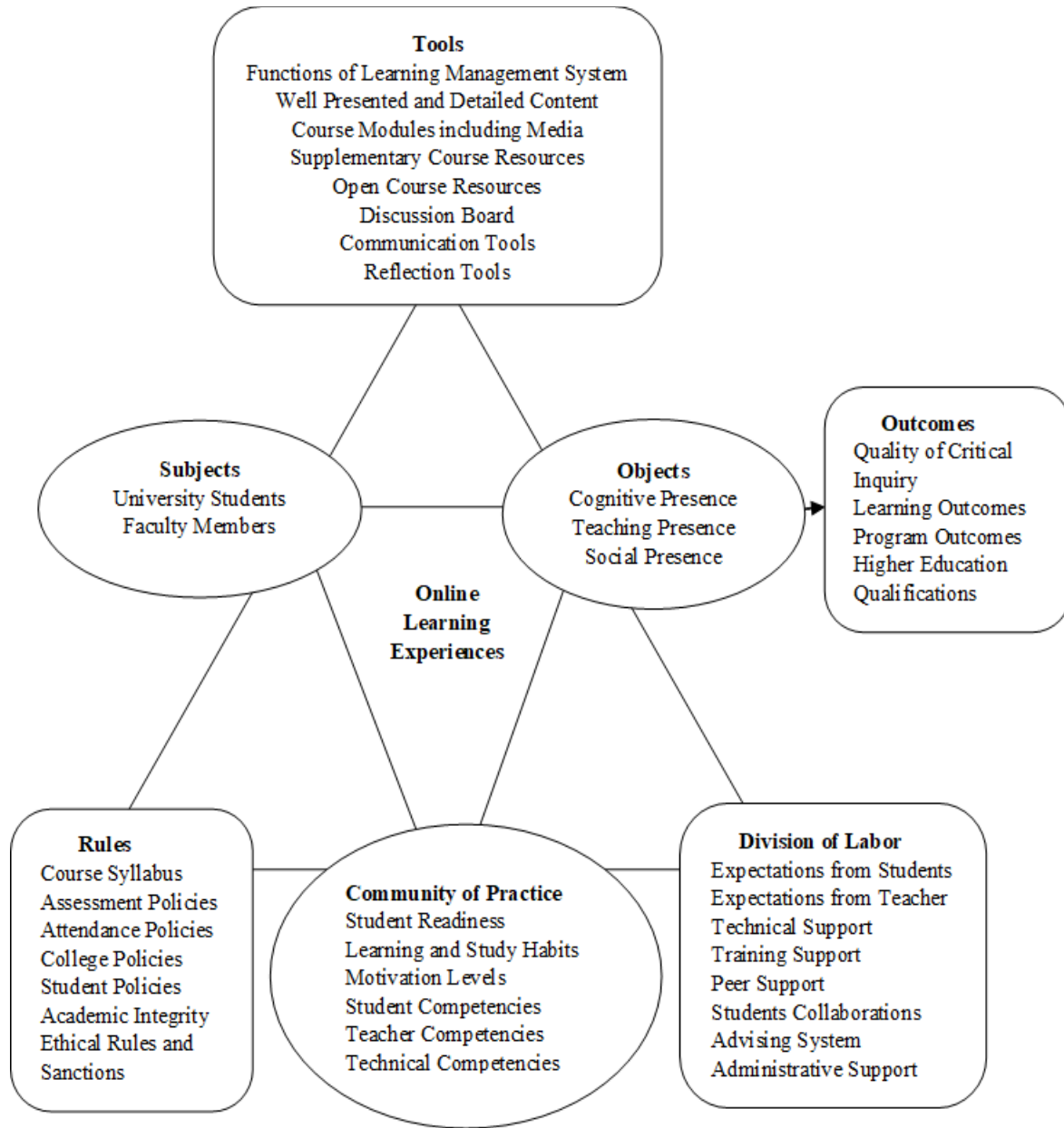
In the present study, the components of the conceptual framework adapted from activity theory refer to "*subjects* (university students, faculty members), *objects* (online learning experiences with cognitive presence, teaching presence, social presence), *outcomes* (the quality of critical inquiry, reaching expected learning outcomes, program outcomes, higher education qualifications), *tools* (functions of the Learning Management System, well-presented and detailed content, course modules including media, supplementary course resources, open course resources, discussion board, communication tools, reflection tools), *rules* (course syllabus,

assessment policies, attendance policies, college policies, student policies, academic integrity, ethical rules and sanctions), *community of practice* (student readiness, learning and study habits, motivation levels, student competencies, teacher competencies, technical competencies), and *division of labor* (expectations from students, expectations from teacher, technical support, training support, peer support, student collaborations, advising system, administrative support)" (Gogus, 2022, p.59-60).

As a main component of the conceptual framework, *subjects* refer to the university students of online or remote courses and the faculty members who develop online courses and adopt their teaching skills to online courses. The study logic is constructed on offering online courses. This can be seen as a new way of orchestrating teaching and learning since individual teachers may pass through a technology adoption process whereby teachers progress through various stages as they integrate technology into their instruction (Gogus, 2005; 2008; 2021). *Objects* refer to the online learning experiences with cognitive presence, teaching presence, and social presence. It is considered that enhancing cognitive presence, teaching presence, and social presence means reaching the learning outcomes of a specific course besides matching the required qualifications of higher education. *Outcomes* refer to the quality of critical inquiry, and achieving the expected learning outcomes, program outcomes, and higher education qualifications. Outcomes in the model presented in Figure 4 suggest consideration of essential learning outcomes of higher education besides the students' learning outcomes at a specific online course. The Association of American Colleges and Universities (AAC&U, 2011), the European Qualifications Framework (EQF, 2006) in Europe, and many national qualifications of higher education (Gogus, 2015) point out that the essential learning outcomes of higher education should include three areas: (a) *Knowledge*. Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles; (b) *Skills*. Developed critical thinking skills and advanced skills required to solve complex and unpredictable problems in a specialized field; (c) *Competencies*. Managing complex technical or professional activities. Teaching presence, cognitive presence, and social presence are vital to success in higher education by considering knowledge, skills, and competencies to be areas of the essential learning outcomes. Cognitive presence is considered an especially essential element of success in higher education since it is a vital element for developing critical thinking skills (Garrison, et al., 2000; Harb & Krish, 2020).

Another main component of the conceptual framework, *tools* refer to many features of the content delivery in the context that uses *Blackboard* as a Learning Management System. Tools include all the functions of Blackboard; well-presented and detailed content including course presentations, articles, e-books, assignments that match the learning outcomes; course modules including media like Khan Academy videos, Jove videos, Panopto videos, YouTube etc.; supplementary course resources by using Blackboard Collaborations with publishers such as Pearson's *MyLab & Mastering*, McGraw Hill Higher Education, and Wiley Course Resources; Open Course Resources; regularly and effectively used discussion board, communication tools such as e-mail and announcements; and reflection tools like blog and journals. *Rules* include the statutes that state the regulations of the higher education institutions related to course design, progress of teaching and learning activities, assessment policies, and rules and sanctions to be followed. All the rules and expectations should be stated in the course syllabus and students should be informed of the expected learning outcomes, weekly course activities, expectations of students during and after the course hours, assessment methods to be followed, assessment policies, attendance policies, additional policies including college policies, student policies,

academic integrity, and ethical rules and sanctions. A course syllabus should include all course aims, students' learning outcomes, weekly activities to be followed, teaching and learning techniques, assessment and evaluation techniques, expectations from students, and web links that can inform all the regulations and sanctions of the higher education institution. The course syllabus should be informative and used as a contract between the teacher and student.

In the present work, *community of practice* presents all the related issues affecting the effective online learning environment. The community of practice can be affected by students' readiness, learning and study habits, motivation levels, student competencies used to follow the course and complete expectations, teacher competencies to design, develop, deliver, and evaluate course activities, and technical competencies of the teacher and students to be able to use the course delivery, communication, and assessment tools. *Division of labor* includes expectations from students informed in the course syllabus in addition to written and verbal explanations in the learning management system, and also expectations of the teacher as part of student and university administrations. Division of labor requires technical support that should be provided to the *subjects*. Teachers should be provided with technical support during their adoption of integrating technology into their courses. Students should be provided with technical support while using the learning management system. In addition, training support and administrative support should be provided for faculty members about the management of online courses and online pedagogy. A student support system should be provided to engage students to complete expectations via peer support, students' collaboration activities, and an advisement system that encourages students to meet with faculty members when necessary. Picciano (2007) presents a Multimodal Model for Online Education and suggests development of online courses by providing content via learning management system, providing activities for self-paced or independent study, social and emotional support, dialectics or questioning, reflection, collaborative learning, and evaluation of learning. These parts of the Multimodal Model for Online Education (Picciano, 2007) can be considered during planning of course activities under the *division of labor* component of the presented Activity Theory Framework in Figure 4 for effective online learning experiences.

Conclusion

This study reviews models for online learning experiences and proposes a new model by adapting activity theory in the online learning management context. This conceptual framework presents a model to design online learning environments by reviewing literature within the framework of activity theory comprised of the components of subjects, objects, outcomes, tools, rules, community of practice, and division of labor (e.g., Morrison and Morrison, 2003, Jonassen and Rohrer-Murphy, 1999, Rapanta, et al. 2020; Richardson and Alsup, 2015, Wang, 2020). It is suggested here that the seven parts of Multimodal Model for Online Education (Picciano, 2017), rich content, social and emotional support, dialectics or questioning activities, reflection, collaborative learning, and evaluation of learning maybe used while developing effective online courses.

Online courses can draw on cognitive presence, teaching presence, and social presence of the Community of Inquiry (CoI) model, yet its comparison with activity theory is an aspect of the model not yet explored. Creating and enhancing cognitive, teaching, and social presences requires an innovation for teachers during planning, implementing, and evaluating their online courses. As teachers develop their own expertise in teaching online, they hopefully contribute to the enhancement of the cognitive, teaching, and social presences for effective online learning. Rosser-Majors, et al. (2022) emphasized the importance of *instructor presence applications*

training and suggest that application of instructor presence practices in the classroom positively and significantly affect course pass rates and reduces drop rates, which, in turn, affect student success and retention. The findings of Rosser-Majors, et al. (2022) support the present research in the field connected to online teaching best practices and student achievement (McCarroll & Hartwick, 2022). McCarroll and Hartwick (2022) argue that the CoI framework can be a useful model to illuminate the student's perspective of the teaching, social, and cognitive presences, which, in turn, helps teachers and designers to improve learning communities and, eventually, learning outcomes.

Reviewing the literature in the fields of CoI, cognitive presence, and teaching presence in online learning environments (e.g. Abbitt and Boone, 2021; Akyol and Garrison, 2008; Caskurlu et al., 2020; Choo et al., 2020; Garrison, Anderson, and Archer, 2001; Garrison, 2009; Garrison, 2021; Lee, 2020; Lindberg and Brown, 2020; Martin et al., 2020; Wang, 2020), the study suggests that objects be considered to be online learning experiences with cognitive presence, teaching presence and social presence, since enhancing the three presences means reaching the learning outcomes of the course besides matching the required qualifications of higher education. The presented new model in Figure 4 can contribute to teachers' adoption of the cognitive presence, teaching presence, and social presence in online courses. This effort can contribute to reaching both students learning outcomes for specific courses and also essential learning outcomes in higher education.

Activity theory has been considered a suitable framework by several authors to examine the use of technology for teaching and learning (Basharina, 2007; Gedera & Williams, 2013; Shambaugh, 2010; Yakubu & Dasuki, 2021). However, contradictions constitute a key concept, or a principle, in activity theory (Basharina, 2007; Engeström, 2001; Gedera & Williams, 2013) as "disturbances and conflicts, but also innovative attempts to change the activity" (Engeström, 2001, p. 134). For these reasons, activity theory is ideally suited to explain the phenomenon of effective online learning experiences. With regards to emergency online teaching and learning, there seems to be only a few studies that attempt to examine the responses and experiences of students and instructors especially pertinent to the Covid-19 pandemic (e.g., Hodges, et al., 2020; Yakubu & Dasuki, 2021); and, hence, the contribution of the present study to the relevant literature with its model to guide the teachers who want to develop experiences on designing and delivering online courses.

By adapting activity theory in online learning management contexts, the present study guide educators on how to design, develop, implement, and evaluate online courses that enhance cognitive, teaching, and social presences. Teachers and instructional designers use the framework to develop their own expertise in teaching online and in enhancing cognitive, teaching, and social presences for effective online learning, thus, improving the processes or the learning outcomes.

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