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BLENDED LEARNING IN HIGHER EDUCATION: AN APPROACH, A MODEL, AND TWO FRAMEWORKS

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Abstract English

In the last two years Higher Education Institutions around the world were forced to make the transition to online and now evaluate and recalculate mistakes, successes and opportunities with a view to continuing or adapting teaching to Blended Learning methodology, since going back to what was in the past no longer seems to be a viable path. This paper, through a literature review, is a first approach within this concept and the frameworks that make Blended Learning a possibility and a strong ally to promote meaningful Teaching and Learning in Higher Education. Subsequently, it is planned to carry out a systematic bibliographic analysis in order to go a step further and identify the main challenges and opportunities that Blended Learning brings to Teaching and Learning in Higher Education in the (post) pandemic context.

Keywords: Blended Learning, frameworks, higher education

Introduction

One of the possible approaches that has arrived with force in Higher Education is the Blended Learning methodology. Blended Learning has become increasingly popular and widely implemented in the most renowned universities as a way to renovate teaching and learning practices and strategies using technologies (Kich, 2020). Blended Learning in recent times has shown itself to be one of the possibilities for the new demands of Higher Education (Singh et al., 2021) in a society that for over two years has been suffering the impacts of a pandemic affecting all Higher Education Institutions (HEIs). Until 2020, these had been offering mostly in-person programs and courses, but they are now feeling the pressure to reevaluate their curricula, methods and practices in order to integrate the online dimension with quality and at least the same results as face-to-face teaching and learning. We have arrived at a historical moment when it is no longer possible to think about formal and institutional teaching and learning without involving the use of ICT in some way. According to Yatigammana and Wijayarathna (2021, p. 59), some researchers have already predicted that the online delivery of lectures will not only be an option for the pandemic situation but will also become one of the main delivery methods in the era of technology development. According to Almmmary et al. (2014), “Blended learning has been growing in popularity as it has proven to be an effective approach for accommodating an increasingly diverse student population whilst adding value to the learning environment through incorporation of online teaching resources” (p. 440)

With this current scenario created by the pandemic that has forced HEIs around the world into digitization as a background, and driven by many questions about theoretical and methodological aspects in regard to Blended Learning, this paper is configured as an attempt to identify and understand the following question: *What are the frameworks and methodological aspects that can make Blended Learning a possibility in Higher Education?* This research question was formulated as a starting point for further research, the objective of which will be to identify the main challenges and opportunities that Blended Learning brings to Teaching and Learning in Higher Education in the (post) pandemic context. At that stage, a systematic bibliographical analysis will be carried out.

The research question formulated for this paper becomes relevant as the teaching community and pedagogical developers in Higher Education seek answers and solutions to current educational demands. This brief investigation is also justified as it is an attempt to carry out a brief state of the art review on the subject of Blended Learning in Higher Education, approaching theoretical perspectives and different frameworks. Seeking to answer, albeit partially, the question cited above, this paper proposes a literature review within the *Education Research Complete* (ERC) database and Google Scholar with a focus on publications with the following descriptors, words and subjects: “Blended Learning,” “frameworks,” “theoretical perspectives,” and “Higher Education.” The focus of the research was on the intersection between such search terms and the area of Teaching and Learning in Higher Education.

Within this bibliographic research, the recurrence of two frameworks for Blended Learning in Higher Education was observed: *Complex Adaptive Blended Learning System* and the *Community of Inquiry*. These will therefore be the frameworks explored in Section 3.

Blended learning literature synthesis and theoretical underpinnings

With the studies developed by several scholars, among them Drysdale et al. (2013) and Halverson et al. (2012, 2014), it can be said today that Blended Learning is no longer just one of the innovative

pedagogical methodologies or a trend practice but that it is already a field of investigation. This field encompasses numerous areas of pedagogical knowledge and can be seen and analyzed from a more complex perspective that involves concepts and areas such as teaching and learning, curriculum, Higher Education, technology in education, and learning community, among other cross-cutting themes. However, according to Hrastinski (2019), to understand the practice and effects of Blended Learning, there is a need for established clear definitions, models and conceptualizations. “This makes it achievable to validate previous research in new settings, contribute to developing a cumulative tradition, and enable deeper exploration of foundational ideas” (Kane & Alavi, 2007, as cited in Hrastinski, 2019, p. 564). While many authors emphasize the advantages of incorporating Blended Learning in HE and its innovative and disruptive character, Calderón et al. (2020) point out that the concept of Blended Learning can also be controversial and very broad, creating a dichotomy in which there is no clarity of what is in fact Blended and what is not. According to Oliver and Trigwell (2005, as cited in Calderón et al., 2020) this lack of clarity in the concept would not help to understand what is actually being discussed when talking about Blended Learning. For Calderón et al. (2020), Blended Learning has become an umbrella term, with different definitions, models and conceptions, as the description formulated by Hrastinski (2019, as cited in Calderón et. al, 2020) about what Blended Learning means in a context of research and practice.

As Blended Learning is still a relatively new concept that has been taking on new guises in recent times due to the new needs imposed by the emergency circumstances in which HEIs are concentrated, it is necessary to explore further what is meant by Blended Learning both in conceptual terms as in theoretical terms involving the concept. According to some of the authors consulted for this research, we can observe an interesting variation of what is understood by Blended Learning. According to Patwardhan et al. (2020, p. 99), the origin of Blended Learning lies in distance learning; it combines six elements: computer mediated instruction with traditional face-to-face instruction through amalgamation of technologies, models of teaching, pedagogies, and styles of learning. For Thomas and Bryson (2021), Blended Learning involves the combination of online educational resources and interactions with more traditional face-to-face learning encounters. The authors also point out the similarity of the Blended Learning concept with the concept of *Hybrid Learning*, terms that are commonly used interchangeably in the literature; however, the term “hybrid” tends to be associated with a higher proportion of online activity, and the two are very distinct concepts relative to completing online learning experiences or distance learning. According to Hofmann (2018, 17), “Every part of a blend — regardless of delivery technology (like virtual classroom, video, or infographic) or instructional strategy (like microlearning, social-collaborative learning, or simulation) — needs to be considered important.” In this way, all learning activities organized within the Blended model need to have the same importance and are part of a previously established and delineated learning context.

However, according to Pimenta (2003), the concept of Blended Learning does not only concern the online and face-to-face dimensions but is intrinsically linked with different pedagogical and didactic approaches, thus being an approach that blends the online with the in-person and the synchronous with the asynchronous, but that also seeks to make use of the theoretical and empirical aspects of the methodologies aimed at online and face-to-face teaching and learning.

Summarizing the conceptual aspects of Blended Learning, Graham et al. (2003, as cited in Curtis & Graham, 2006) state that Blended Learning can therefore be understood in three different dimensions:

the dimension that combines different instructional modalities (or delivery media), the dimension that combines instructional methods, and the dimension that combines online and face-to-face instruction.

In order to deepen what is meant by Blended Learning and what are the possible theories that underpin this methodology, two theories will be presented below; these theories are distinct but they help to understand the BL and also to implement it with grounded theoretical bases.

Two frameworks that support blended learning in Higher Education

It is fundamentally important to ground teaching practices in Higher Education — whether online, face-to-face or Blended Learning — into theories in order to promote better decisions for more meaningful teaching and learning. Wang and Yang (2015) elaborated an overview of the available frameworks that can be used to understand the theoretical and methodological aspects of Blended Learning; however, in this paper, we will only address two of them: the *Complex Adaptive Blended Learning System* (CABLS) and the *Community of Inquiry*. The choice of these two frameworks was due to the need to base Blended Learning practices in a way that is coherent with the current reality of the digitization of Higher Education

The Complex Adaptive Blended Learning System as a Blended Learning Framework

The integration of technology with teaching and learning practices has increased the complexity of what we understand by learning in recent decades. Such complexity favored the creation of systems that help to support new changes, as in the case of the Complex Adaptive Blended Learning System, which has its origin in the term *Complex Adaptive System* (CAS) from the natural and exact sciences and is recognized for collaborating in the understanding of non-linear and dynamic systems “such as neural systems, ecologies, galaxies, and social systems” (Wang & Yang, 2015, p. 382). According to Wang and Yang (2015), some of the characteristics of the Complex Adaptive System are complexity, self-organization, adaptability, dynamism, and the ability to co-evolve. Complexity can be understood as a characteristic of systems that are not linear and have several layers of subsystems that, while being autonomous, are part of something bigger. Self-organization is the system's ability to iterate as the subsystems interact with each other and give rise to new orders and patterns of behavior that self-regulate. Adaptability is a kind of natural selection of systems, where it is the ability, with the creation of new rules from the combination of old rules, of only the fittest systems to remain. The characteristic of dynamism concerns the capacity for stability but also for change in the face of new demands and configurations. Finally, the ability to co-evolve is about how the changes that happen in one part of the system reflect on the surrounding sub-systems (Cleveland, 1994, as cited in Wang & Yang, 2015).

According to Oliveira et al. (2021), learning environments are deemed adaptive if they are able to monitor the activities of their users; interpret these on the basis of domain-specific models; infer user requirements and preferences out of the interpreted activities; appropriately represent these in associated models; and, finally, act upon the available knowledge about the users and the subject matter at hand to dynamically facilitate learning. This vision of systemic complexity provided by CABLS helps to understand the nature of Blended Learning, since Blended Learning concerns a complexity of factors that involve human learning. Branch (1999, as cited in Wang & Yang, 2015) identified eight subsystems within Blended Learning: students, content, media, teachers, peers, time, goal, and context. Wang and Yang (2015) then propose the six-dimensional CABLS structure.

Figure 1 illustrates the six subsystems and their relationships: the learner, the teacher, the technology, the content, the learning support, and the institution. Similarly to any complex system, the six subsystems act within themselves and upon one another in a dynamic and non-linear fashion. At the same time, each of these subsystems has its own characteristics and internal driving forces, depending on surrounding subsystems, to maintain its vitality. Furthermore, each subsystem also has its own subsystems, and all interact with one another to form a system of Blended Learning (Wang & Yang, 2015, p. 383).

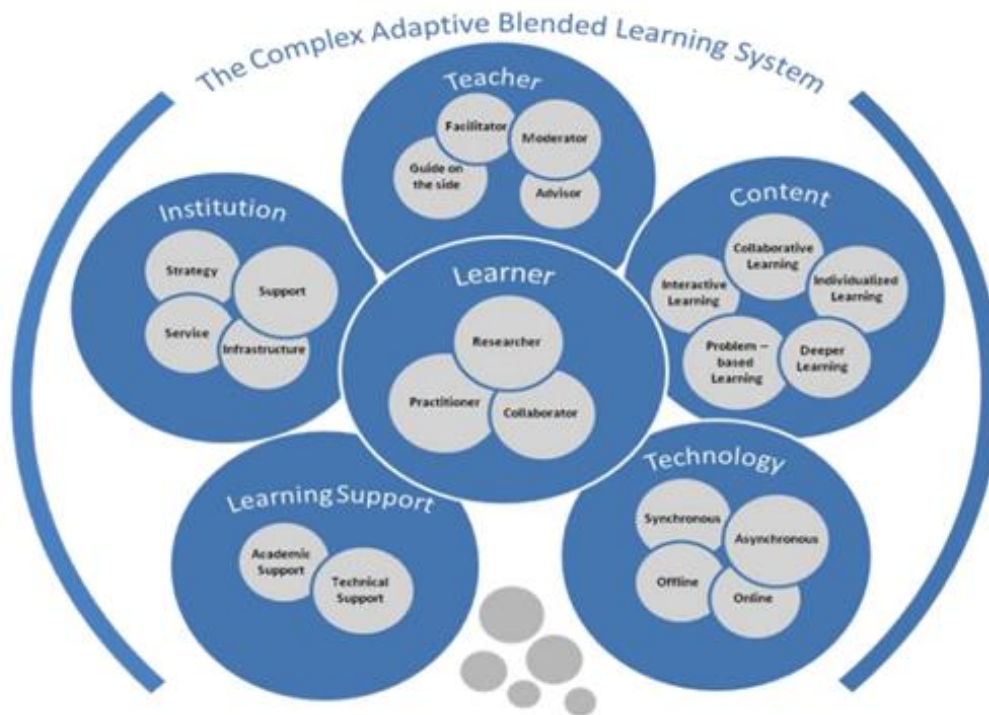


Figure 1: The Framework of Complex Adaptive Blended Learning Systems (CABLS), (Wang & Yang, 2015, p. 383)

This framework consists of six central elements: teacher, learner, technology, institution, learning support and content. The learner role in the *Blended Learning Environment* (BLE) can change and adapt as students engage with the elements of the system. The most important thing is that the student, within this system, plays an active role and therefore several characteristics or functions are added: researcher, practitioner, and collaborator. The Teacher's role in a BLE “co-evolves with other subsystems, particularly with learners, to become a generation of teachers with new identities and multi-disciplined professional skills” (Wang & Yang, 2015, p. 383). The main functions of the teacher become moderator, advisor, facilitator and guide in the learner's learning path. The Content has a great influence on learning and concerns the subject matter and the elements used to engage learners in the process of learning a given subject. Technology in this framework concerns the equipment, resources and mechanisms that expand the human capacity to perform any activity, being a fundamental part but also transitory since within the system only the technologies that will better facilitate Blended Learning remain (Wang & Yang, 2015). The Learning Support is about the support that learners receive over time within this framework so that they can do their part and become competent. This Learning Support can be both in terms of technological support for using tools and in terms of understanding content and tasks. The

Institution has an important role within the framework as it provides the basic support for Blended Learning to take place and understands the strategic elements of support, services and infrastructure.

McGEE and Poojary (2020) researched the perceived dynamic relationships that exist among the stakeholders (i.e. teachers, students, administrators, and learning support members) within the CABLS in a Higher Education BLE and found that CABLS truly provides collaborative, complex, dynamic, interdependent, and student-centred teaching and learning relationships. According to this research, the participants' perception was that CABLS provided a positive academic experience, as the structure of the framework allows for changes in the Blended Learning Environment itself. CABLS also allows the content to be presented in several different ways in order to facilitate dynamic learning, while constant exposure to new technology helped stakeholders to have an open mind to try new things: "When a new technology was introduced, stakeholders had to work together to select, implement, and troubleshoot problems" (McGEE & Poojary, 2020, p.8).

According to Wang and Yang (2015, p. 390) the CABLS framework was designed to "facilitate a deeper, more accurate understanding of the dynamic and adaptive nature of Blended Learning." This framework can also help HEIs which are starting this process of implementing Blended Learning to understand and focus on the key components that interact with each other in the formation of a program or a blended course.

Although this seems to be a very robust framework for Blended Learning that reliably details the elements and roles of each of its components, there was a lack of an element considered crucial in the teaching and learning relationships in HE, namely the assessment of learning. For Rodrigues (2015), the assessment of learning is an inseparable part of the Blended teaching practice. In this way, the innovative character of Blended Learning includes, and must also establish parameters within, any frameworks that take into account the evaluation, not only summative but also formative.

The Community of Inquiry as a Blended Learning Framework

In the 2000s, a framework with theoretical bases to offer structuring of blended environments called *Community of Inquiry* (CoI) was developed by Garrison et al. This framework has attracted a lot of attention and has helped many HEIs as a "desirable destination for quality research on online learning environments and has become increasingly popular as a tool for conceptualising the online learning process" (Garrison & Arbaugh, 2007, p. 158). According to the authors, an element that has attracted attention in Higher Education is the possibility of creating learning communities: "Higher education has consistently viewed community as essential to support collaborative learning and discourse associated with higher levels of learning" (p.159). But the challenge is in understanding how to do this in Blended Learning Environments and contexts.

The CoI framework represents a process of creating a productive and meaningful learning experience based on the collaborative-constructivist model that encompasses the development and interdependencies of three basic elements (or presences): the social presence, the cognitive presence, and the teaching presence. The concept of presence used by the authors of the CoI can be understood as follows: a state of receptivity; awareness of the social, cognitive, emotional and physical functioning of the individual and the group in the context of their learning environments; and "the ability to respond with a considered and compassionate best next step" (Rodgers & Raider-Roth, 2006, p. 266). With deep roots in the constructivist ideas of Dewey (1938), who announced the individual experience as a fundamental element in the construction of knowledge, and in Piaget's (1977) socio-constructivism, CoI requires

more active learning. According to Makri et al. (2014, p. 186), unlike content-based learning, where learning is guided by the content to be learned, active learning is based on the cognitive engagement of the learner that favors greater control over the development of their own learning and knowledge.

Participation in a CoI involves the (re)-construction of experience and knowledge through the critical analysis of subject matter, and the questioning and challenging of assumptions. This definition is based on the premise that an educational learning experience is both collaborative and reflective.

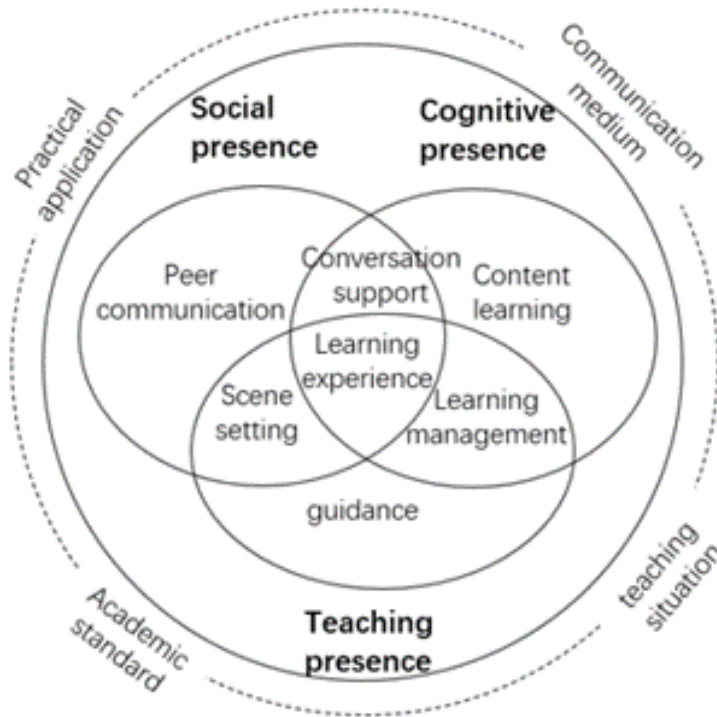


Figure 2: The Community of Inquiry framework (Zhang et al., 2020, p. 225).

Within this framework, *Cognitive Presence* concerns “the degree to which learners construct meaning through continuous reflection and dialogue in the inquiry learning community” (Zhang et al., 2020, p. 225). Cognitive presence is based on four stages: triggering events (situation or topic that generates discomfort, doubts or interest); exploration (movements to explore and clarify a certain event, situation, concept or phenomenon); integration (reflecting upon how new information and knowledge discovered can be integrated into a coherent idea or concept (Garrison et al., 2000, as cited in Vaughan, 2010, p. 62); and problem solving (corresponds to using everything that was built in the other phases to solve the initial problem). In this way, creative thinking provides deep learning, and together with the outcomes, the cognitive processes should be the focus of an educational CoI where the social and the teaching presences are just the facilitators of the learning process (Vaughan, 2010).

Social presence concerns “the ability to create a learning environment and atmosphere that enables learners to communicate in a friendly and supportive environment and demonstrate true social and emotional expression capabilities” (Zhang et al., 2020, p. 226).

Teaching presence concerns “designing, promotion and guidance of learners’ cognitive process and social communication to achieve meaningful and valuable learning goals” (Zhang et al., 2020, p. 226).

Teaching presence is essential for promoting deep learning and student engagement within the community. It should be noted that teaching presence does not concern only the teacher but all subjects involved in the learning community; that is, students are also included in this presence as they also play a peer-teaching role, and the teacher has a leadership and guidance role.

In research that focused on understanding the social and the teaching presence required to create a blended community of inquiry among faculty members, Vaughan and Garrison (2006) point out that the use of CoI, not only with students but with teachers and faculty members, can create a flexible and accessible environment for faculty to engage in critical and sustained reflection on their own practice. CoI can therefore be an important support as HEIs need to re-design courses and programs for Blended Learning. “The key to creating a cohesive, purposeful and worthwhile community of inquiry is the integration of social, teaching and cognitive presence.” This integration can promote meaningful experiences, where “Each of the three presences manifest themselves and evolve in different ways in a face-to-face or online context” (Vaughan & Garrison, 2006, p. 150).

Based on these three presences described above — social, teaching and cognitive — the CoI framework has the potential to create opportunities in Blended Learning for active cognitive processes, self-reflection and interaction with peers. In addition, the teacher's guidance is especially important in order to create engagement leading to true learning communities in Higher Education.

Final considerations

From the formulation of the research question *What are the frameworks and methodological aspects that can make Blended Learning a possibility in Higher Education?* and through bibliographic research, it can be observed that Blended Learning has surpassed the boundaries of being just a trend or one more pedagogical methodology that makes use of technologies to meet the demands of Higher Education to be a true field of investigation. This field of investigation has become robust to the point that several theories and frameworks are being developed in order to provide solid theoretical and epistemological bases for Higher Education so that teaching and learning practices can be grounded in verifiable theories and practices. Although there are numerous different frameworks in the literature for Blended Learning in Higher Education, in this work we sought to focus on only two of them: the Complex Adaptive Blended Learning System and the Community of Inquiry. These have proved to be strong allies in the implementation of a Blended Learning System in Higher Education that is oriented towards a constructivist and socio-constructive view of the realities of teaching and learning, both online and face-to-face.

The biggest positive aspect of the Complex Adaptive Blended Learning System is the ability of this framework to organize both roles and elements that are part of Blended Learning in order to seek to ensure that each part fulfills its function and interacts with the others in a way that is both fluid and adaptable to the realities and needs of the context in which Blended Learning is being offered. A single negative point to be highlighted is the fact that the framework does not mention the evaluative dimension of the teaching and learning process in Blended, which may be a seventh item to be considered in the future.

The biggest positive aspect of the Community of Inquiry framework is the fact that teaching presence is not only about the teacher's role within the learning process in Blended Learning, but is a task for

everyone involved. This therefore places a commitment on all the subjects involved, through exchange and active presence, to make learning occur in a meaningful way.

This work was therefore configured in a first approach to the research topic that will be further deepened through systematic bibliographic analysis in order to take a step forward and identify the main challenges and opportunities that Blended Learning brings to Teaching and Learning in Higher Education in the (post) pandemic context.

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