INTERACTIVITY, THE HEART AND SOUL OF EFFECTIVE LEARNING: THE INTERLINK BETWEEN INTERNET SELF-EFFICACY AND THE CREATION OF AN INCLUSIVE LEARNING EXPERIENCE

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ABSTRACT

There is a growing recognition that the relationship between digital technologies and education is more complex and multi-faceted than previously conceived. Given the multi-faceted nature of digital education, which involves social and technology elements in the realm of knowledge-acquisition, an epistemic community such as a community of inquiry (CoI) provides an appropriate theoretical perspective to frame the analysis of the interlink between internet self-efficacy and inclusive learning experiences. In recognition of the importance of active participation in the ubiquitous learning environment, the argument focused on the development of a CoI as an intellectual community that provides a structure for educators to implement digital education. Central to this article is the development of the various presences to sustain interaction and reflection in a socio-epistemological orientation approach. Notwithstanding the widely recognised affordances of digital technologies to connect people, this study was conducted to elicit relevant evidence on digital education, to gain insights into the practicality of digital education, to articulate several important research questions within each of the identified affordances, and to provide suggestions for institutions pursuing digital education. Furthermore, there is clear evidence that digital education is intertwined with digital capital and digital inclusion.

Keywords: interactivity, community of inquiry, digital education, digital capital, digital equity

INTRODUCTION AND BACKGROUND

As a result of the rapid transition to digital education, various digital learning platforms and technologies have been implemented in higher education to enable remote teaching and learning. According to John and Sutherland (2005, 406), "the emergence of new digital technologies has offered up the possibility of extending and deepening classroom learning in ways hitherto unimagined". Digital education, also known as technology-enhanced learning or TEL, refers to the integration of digital tools and technologies into education to advance teaching and learning through the Internet. Increasing access to affordable tertiary education digitalisation has been identified as one of the potential means of widening access to higher

education (Landri 2018). However, digital education requires educators who are well trained in the use of various digital learning platforms to provide technology-driven pedagogies and develop multimodal content. This work argues that the interplay between digital technologies and the development of communities of inquiry (CoIs) is important. According to Garrison and Cleveland-Innes (2005, 134), a CoI must include "various combinations of interaction among content, teachers, and students". However, the quality of various combinations of interactions in digital platforms depends on digital capital, digital equity and institutional capacity (Dlamini and Ndzinisa 2020; Ndzinisa and Dlamini 2022; Sekome and Mokoele 2022).

During the transition to emergency remote teaching, I was tasked by Senior Management at the University School of Education to Co-chair the War Room Committee with the mandate to ensure that all courses are moved to an online learning platform. While the global pandemic accelerated the pedagogical integration of digital technologies in education in what became a fathomable but cumbersome experience, academic staff were constantly seeking help to use digital learning platforms and requesting digital devices. While government and the University Senior Executive Team opted to adopt ubiquitous technologies to save the academic year, there were some serious challenges, especially those associated with digital devices, digital capital and digital fluency among academic staff and students. Furthermore, the information and technology gap was made visible among academic staff and students. There was the split realities of the "haves" and the "have nots", and the transition to online learning platforms without a systematic transition could further marginalise historically disadvantaged people.

Clearly, my argument goes beyond the connected and disconnected because the academic staff were already connected but without online instructional design principles and the digital capital to develop digital education resources to make the transition to digital education. Hence, the need arose to analyse digital education from a perspective of digital capital and digital equity to close the knowledge gap on digital education in an unequal society. According to Mutsvairo, Ragnedda, and Orgeret (2021, 296), digital transformation "requires a broader adoption of digital technology and cultural change. It is dependent on both technology and people." Although there are varying degrees and levels of digital technology affordances, the transition to digital education is about pursuing new ways of serving students. Therefore, it became necessary to critically assess the inclusivity of digital education and to make better sense of the interplay between internet self-efficacy and the creation of a CoI. This was done to shed light on the importance of creating professional communities to develop digital fluency and capacity to ensure that no educators and students are left behind, especially because of the rapacious inequalities that already exist in our society.

Garrison, Anderson, and Archer (2000) explain the importance of presence and

engagement in cognitive environments. Hence, the research focused on developing an understanding of the interlink between internet self-efficacy and the creation of a CoI, and on how their intersection enables the three dimensions of presence (social presence, teaching presence and cognitive presence; Garrison, Anderson, and Archer 2000). The term self-efficacy refers to "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura 1997, 3). In this study, internet self-efficacy relates to lecturers and students' confidence in using the internet as a platform to enable their remote teaching, learning and participation. Internet self-efficacy is not limited to using browsers or search engines but extend to communication, sharing, application and cognitive processes, such as verification and metacognition (Alqurashi 2016; Chuang, Lin, and Tsai 2015). Therefore, lecturers and students with high confidence on computers and various digital technologies were more likely to have high satisfaction with teaching and learning, respectively in an online environment. Beyond internet self-efficacy, lecturers and students must develop learning management system (LMS) self-efficacy. Building capacity to use a LMS must be a priority to avoid excluding students and to open tertiary education beyond the "brick and mortar" monopoly (Dlamini and Ndzinisa 2020). LMS systems have become pedagogical tools that influence cognitive process activation and is not being treated as a support educational process tool anymore.

However, digital capital is a key component in the transition to LMS, also known as digital learning platforms, especially during the process of creating professional communities via the virtual platforms. The affordances of a LMS enable equitable learning processes in an ideal world and open opportunities to multiple entries to education. Digital capital is key in the transformation of "digital resources into social resources and to exploit the full advantages offered by the Internet" (Ragnedda 2018, 2366). In this case we provide an analysis of the peculiarity of digital capital, especially on the use of information and communication technology in education and as a source of social inequality. Ragnedda (2018, 2367) explains digital capital as "the accumulation of digital competencies (information, communication, safety, content-creation and problem-solving), and digital technology". In Bourdieusian terms, Ragnedda (2018, 2367) further define digital capital as "a set of internalized ability and aptitude" (digital competencies) as well as "externalized resources" (digital technology). Access to digital devices and technologies and the accumulation of digital competencies that are socially valued and usable resources are fundamental to digital capital.

Having access to digital capitals "produces differential effects in students with respect to the way they participate in and respond to learning situations in Web environments" (Valencia-Vallejo, López-Vargas, and Sanabria-Rodríguez 2018, 1). There is a correlation in the level of

digital capital and the quality of engagement in an online environment or the participation in an online digital learning platforms (Dlamini and Ndzinisa 2020; Ragnedda 2018; Sekome and Mokoele 2022). The development of CoIs enable the circulation of various types of knowledge on digital education and inclusion; however, these communities must first be created, and participation requires access to digital devices and technologies. Hence, it is important to tackle the issue of digital capital and the creation of CoIs to avoid reproducing social inequalities. The potential of virtual professional communities is huge, and therefore, it is important to explore the interplay between internet self-efficacy and the creation of a CoI to ensure that even those on the margins of society are included. The following questions guided the study:

- What is the interplay between internet self-efficacy and the creation of a CoI?
- In which ways do the three dimensions of presence support interaction and reflection in a technology-enhance learning environment?

THE INTERSECTION OF DIGITAL CAPITAL AND EDUCATION

Digital capital includes the two dimensions of digital access and digital competence (Ragnedda, Ruiu, and Addeo 2020). Digital equity is understood "as an integral set of users' access to information technologies, digital communication environment (primarily the internet) and the ability to use them for professional and personal purposes" (Vartanova and Gladkova 2020, 1). Institutional capacity refers to the ability to adapt to digital advancement and disruptions to incorporate and integrate digital technologies into teaching and learning. In most cases institutional challenges are the transition to digital education, especially the investment in technology, which "has not been matched by the professional development activities and the development of digital resources to inform new ways of teaching and learning" (Dlamini and Ndzinisa 2020, 57). The shift to online or digital education represents a fundamental change to teaching and learning, and hence, it is important to develop digital literacy to enable ubiquitous education.

Higher education institutions' educators' digital abilities, creativity, and technology access are central to inclusive and transformative learning experiences (Valencia-Vallejo, López-Vargas, and Sanabria-Rodríguez 2018; Vartanova and Gladkova 2020). In the creation of CoIs, there is a long-standing systemic disparity in technology access and digital literacy, hindering equitable access to virtual professional communities of practice. Communities of practice provide a practice-based framework for collaborative learning in professional groups (Andrew, Tolson, and Ferguson 2008). In the education sector, virtual communities of practice are used to improve the quality of teacher education professional practices and support

knowledge sharing behaviour. Virtual communities of practice are aligned with Vygotsky's (1978) social constructivist pedagogical perspective that emphasises the social context of learning where students actively construct knowledge independently or within a CoI through interactions. Then the question is how digital capital may be affecting the creation of inclusive and transformative learning environments in accordance with the three dimensions of presence. The operationalisation of the elements of presence within a CoI depends on the interactions of all presences and the positioning of digital learning technologies. The argument is about digital capital because the creation and sustainability of any virtual community greatly depends on the lecturer's digital fluency.

This is not in any way negating the importance of pedagogical content knowledge (Shulman and Sparks 1992). Hutchings and Shulman (1999, 13) propose that "all faculty have an obligation to teach well, to engage students, and to foster important forms of student learning". A systematic mapping of the three dimensions of presence that satisfy online learning experiences was considered to capitalise on the digital education and technology affordances for educational purposes. The three dimensions of presence are social presence, teaching presence and cognitive presence (Garrison, Anderson, and Archer 2000). In principle and in an ideal world, digital technologies have the potential to reduce "social disparities, to tackle social exclusion, enhance social and civil rights, and promote equity" (Ragnedda 2020, 2). It is necessary to achieve digital equity because digital education supports ubiquitous teaching and learning by creating a unique and valuable online distributed learning environment (Dlamini and Ndzinisa 2020; Sarker et al. 2019).

Distributed learning environments support higher order learning through student, instructor and content interactions. Moving from the assumptions of digital technology affordances as derived in the algorithmitisation of society as homogeneous, this study worked with the three dimensions of presence to support interaction and reflection in a socio-epistemological orientation environment. Watson et al. (2016, 55) define social presence as "the degree to which participants identify with and feel connected to each other in an online environment"; Anderson et al. (2001, 1) define teaching presence as "design and organization, facilitating discourse, and direct instruction" for the purpose of realising meaningful and educational worthwhile learning outcomes; and Garrison, Anderson, and Archer (2000, 89) define cognitive presence as the "extent to which the professor and the students are able to construct and confirm meaning through sustained discourse (discussion) in a community of inquiry". The three dimensions of presence demonstrate the complexity of being an educator and the different roles lecturers have to play in order to create an inclusive learning environment. Importantly, the creation of inclusive learning environments lies with the

educator, who constantly have to research and participate in professional communities of practice where knowledge and best practices are shared.

THEORETICAL FRAMEWORK/PERSPECTIVE

The three dimensions of presence form the basis of the argument for digital capital and the interlink between internet self-efficacy and the creation of a CoI. Interrogating the digital and internet skills required to function in a CoI was necessary to further avoid inequalities in knowledge development. With the physical "brick and mortar" classroom losing its monopoly in education, there are many purported digital affordances that must align with education. The idea is to give meaning to digital education while at the same time allowing educators to operationalise CoIs through engagement with students and at the same time allowing students to reflect in a safe space and be able to ask questions in a professional space regardless of their background. The CoI framework is based on a model of critical thinking and practical inquiry (Garrison, Anderson, and Archer 2000) and is social constructivist in nature (Vygotsky 1978). There is a legitimate concern about the isolating nature of digital education, but the creation of learning communities with meaningful interactions facilitates active learning and cognitive presence.

CoIs have been proven as a coherent theory to understand complex interactions, especially "the core elements (cognitive, teaching and social presence) essential to study and shared metacognition in a learning community" (Garrison and Akyol 2015, 67). According to Garrison and Akyol (2015, 66), metacognition "is a required cognitive ability to achieve deep and meaningful learning that must be viewed from both an individual and social perspective". This article posits that learning manifests in a highly integrated interactive community with social presence, teaching presence and cognitive presence. University lecturers are central to creating presence and quality interactions to ensure student satisfaction and learning.

Educators' internet self-efficacy is important in the development of inclusive learning experiences. Self-efficacy is the belief "in one's capabilities to organise and execute the courses of action required to produce given attainments" (Bandura 1997, 3). Hence, internet self-efficacy is the believe in what individuals can accomplish in a web-based environment, and therefore, it is important to develop a set of skills to establish and maintain the various presences in virtual platforms. Thus, this study considers digital capital a key component in digital education based on the interlink between the internet and digital pedagogies constructs. The establishment of CoIs where students can participate freely and develop both disciplinary knowledge and digital capital can stop any new forms of inequalities arising from poorly designed learning environments.

CONCEPTIONS OF INTERACTION AND REFLECTION

The digital revolution enabled by social and ubiquitous technologies is constantly transforming the education space by allowing multiplicity representation of content knowledge. Digital education taps into different sources of knowledge, and the most important is the intersection of content knowledge, technological knowledge and pedagogical knowledge. Subject to digital institutional constraints, it is essential to interrogate the pace of technology innovativeness and appropriation to promote inclusive and innovative digital pedagogies. Inevitably, interactivity depends on how content knowledge, technological knowledge and pedagogical knowledge intersect. The intersection depends on the lecturers having the appropriate digital skills, especially the innovative use of the internet and social media to create an enabling environment as shown in Figure 1. Social media refers to "any technology that facilitates the dissemination and sharing of information over the Internet" (Robbins and Singer 2014, 387). The affordances of the Internet and social media are interactive communication, virtual connections, knowledge distribution, sharing information, searching information, multimodal content representation and access to widened audience (Robbins and Singer 2014). Therefore, educators are expected to leverage internet and social media platforms to achieve multimodal interaction in their teaching and learning as shown in Figure 1. In the CoI, the teacher presence has three dimensions: designer, instructor and facilitator within the online environment (Tucker 2020). While the Internet and social media affordances offer exciting opportunities in teaching and learning, these tools demand supporting and enabling structures for educators to fully adopt and appropriate these technologies into their professional pedagogical practice (Stewart 2015).

Lecturers who have been teaching in a traditional classroom found the transition to remote emergency teaching in 2020 daunting and foreign. The transition was sudden, without exposure to instructional design principles and digital literacies to make the transition seamless. Breaking away from the traditional methods meant "recreation and repurposing of the learning environment" allowing technology to better fit the current context of the teaching and learning (Stewart 2015, 492). It is important to set up structures to best prepare and support educators to pedagogically integrate technology in their professional practice. According to Cochrane (2014, 67), central to transforming pedagogy is "sustained collaborative partnerships between researchers and practitioners with a focus upon pedagogical transformation" and "allowing for interaction that helps to re-conceptualize the roles of teachers and students to be co-designers and co-constructors of knowledge" (Stewart 2015, 491). Underpinning the transition to technology-enhanced classrooms is social constructivism. The Internet is inherently social technology that provide "powerful tools [platforms] for enabling social constructivist

pedagogy" (Cochrane 2014, 72).

Dlamini and Ndzinisa (2020) call on lecturers to adopt the social constructivist pedagogical approach where students actively construct knowledge and understanding (Vygotsky 1978). This is why it is important to sustain interaction and reflection in a socio-epistemological orientation environment. Figure 1 illustrates the importance of the intersection of teaching presence, social presence and cognitive presence to create a multidisciplinary CoI in digital education. Through interactivity, educators and students are able to create and participate in "learning communities for the co-construction of knowledge" (Stewart 2015, 489). The interaction as presented in Figure 1 presents opportunities for continuous engagement with disciplinary knowledge, timely feedback, mentoring and access to various perspectives.
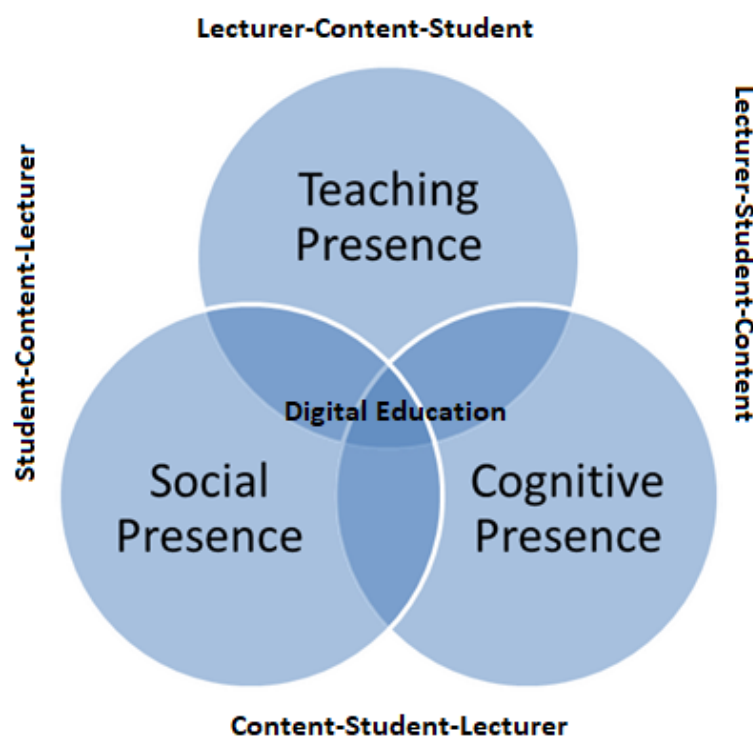

Figure 1: Interaction in a teaching and learning community

Through the application of the interaction equivalency theorem to develop meaningful interactions, I argue that digital capital is the enabler of the intersection of various interactions (student-lecturer, student-content, student-student) and the three dimensions of presence. The interactivity can be initiated at different levels; however, the lecturer is key for lesson sequencing and multiplicity representation of content. In the centre of this intersection is the positioning of digital devices, such as laptops, to mediate the interaction between students, content and lecturers. Like all socio-economic institutions and systems, the positioning of digital technologies should not suffocate the humanistic aspects of the educative process.

Hence, the disruptive nature of digital technologies should support digital education innovations that extend existing structures to be inclusive and enable the diverse profile of students. However, this entails providing digital pedagogies support structures to academic staff to enrich their adoption and appropriation process to achieve optimal usage.

The abrupt transition in 2020 was problematic because lecturers have always followed a face-to-face approach and were suddenly forced to present content in multimodal forms without the proper training and development of their digital skills. The abrupt transition meant "teaching and learning disruption" and "technological disruption". In teaching and learning disruption, lecturers and students had to adjust to new ways of teaching and learning, respectively. Technological disruption meant that fundamental innovations were driven by technology, "typically out-of-school practices" (Stewart 2015, 492). Figure 1 is aligned with Rambe's argument that "when Social Media environments are tightly anchored in constructivist, knowledge centred learning environments where dialogical discourses and on-task academic behavior are sustained, they present profound opportunities for deep scholarly engagements" (Rambe 2012, 132). Hence, the understanding and navigating the affordances of the Internet and digital learning platforms to produce meaningful engagement and discussions is important. Out of meaningful engagement and discussions, there is co-construction of knowledge in the teaching and learning communities.

However, despite the promises of digital technologies, the following question should be asked: What are the underlying principles that make digital education intuitively legitimate to wider society? This will avoid the claims that online or digital education lack rigour, depth and breadth. Drawing on social epistemology and technology affordances, I argue that the interlink between internet self-efficacy and the creation of a CoI has the potential to revolutionise education. Digital learning platforms provide a number of features that enable both synchronous and asynchronous engagement. Both synchronous and asynchronous engagement allow "flexibility of online discussions, collaboration and group work" (Tucker 2012, xvii). In a CoI, students learn at their own pace while receiving collaborative support, and therefore, it is important to implement both synchronous and asynchronous elements in courses. The CoI provides a framework for both lecturers and students to create professional learning communities (PLCs) to engage and exchange information. In the CoI, participants gain new perspectives and new outlook.

According to Tucker (2011, 346), students and educators within a CoI "are able to speak to each other, share ideas and information". For this to be effective, there must be an intersection of both synchronous and asynchronous engagement and pedagogy to promote social presence. The reality is that technology is making educators more effective and allows them to reflect on

their pedagogical practices as they maintain continuity in their instructional activities. Unlike in the traditional face-to-face approach where lecturers feel indispensable, ubiquitous computing has enabled online message boards or spaces embedded in digital learning platforms to allow both synchronous and asynchronous discussions (Krause, Tucker, and YoungGonzaga 2015; Tucker 2012). The creation of a virtual safe space and establishing the expectations for effective discussion are central to effective online collaborative support.

However, the virtual spaces must be "characterized by affective work relationships, strong group cohesiveness, trust, respect and belonging, satisfaction, and a strong sense of community" (Kreijns et al. 2007, 179). Central to effective engaging virtual spaces or creation of intellectual engagement are the academic staff. The announcement feature in a digital learning platform allows educators to make weekly announcements with explicit instructions on topics to be covered and assignment expectations. Tucker (2020) asserted that weekly announcement strategy enhances student interactions with the subject content and maintains a teaching and social presence. The COVID-19 pandemic ushered higher education into the ubiquity of networked connections between people, content, and digital tools. Hence, the socio-epistemological orientation is necessary to education fostering a space for learning connections. While digital education enables self-regulated learning, the following underlying question must be asked: What are the principal factors mediating the three dimensions of presence in digital education? Gaining deeper insights will settle lecturers' questions about the rigour, depth and breadth of digital education. Although access to the internet enables deeper and wider exploration of a subject, digital capital and equity are not options.

DISCUSSION

What is the interplay between internet self-efficacy and the creation of a CoI?

The ubiquity of internet technologies, such as web-based learning platforms, provides an extraordinarily rich environment for exploring learning (Dlamini and Ndzinisa 2020; Kreijns et al. 2007; Tucker 2011). At the level of the epistemic community, social epistemology can serve as an effective new knowledge paradigm in the web-based learning environment. Vygotsky's concept of the zone of proximal development rings true and places students in a context where they need to leverage their prior knowledge and use collaborative support within the CoI. At each point of interaction, the collaborative support within the CoI allows students to reflect on ideas or concepts and ask questions. The fact that the students and the lecturer can respond

allows for multiple perspectives to be given on the topic or subject.

The zone of proximal development was defined by Vygotsky (1978, 38) as follows: "The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers". Figure 2 demonstrates learning through social interactions, which is constructivist in nature. As could be expected, in Vygotsky "one only develops as one participates in various forms of social interaction" (Lourenço 2012, 282). As referred to above, the level of the epistemic community is fundamental to collective development and understanding. The Vygotskian social and collective approach to learning can be seen through the interaction lens (see Figure 1). The various interactions in Figure 1 give educators and students extended discourse to engage, share and co-construct meaning.

In my view, in order to deliver effective digital education, there must be alignment with the CoI model and the interaction equivalency theorem posited by Anderson (2003). The elements of a CoI enable the different interactions, and their intersection is essential in the creation of a productive learning community. Building on the three integrated elements of CoI, I suggest accepting the reality that the monopoly of face-to-face instructions has been severely disrupted and we now need to move towards a more sustainable hybrid approach to teaching and learning and use this opportunity as an impetus to add innovation in the approach to inclusivity and the transformation of the curriculum. Besides lecturers, institutional culture and structure are an impediment to change, especially the emphasis on the transmission of knowledge into the minds of passive students. Digital technologies provide alternative tools to a passive learning environment in the form of podcasts, video streams, slide-casts, forums, mind-maps, and virtual classrooms. The only challenge is that technology is costly and requires digital knowledge to implement. Upfront investments can prove to be costly, but the returns on value and on the investment in the long run are worth it.

In which ways do the three dimensions of presence support interaction and reflection in a socio-epistemological orientation environment?

As educators assume the role of facilitation and instructional design in digital education, it is critical to sequence lessons and ensure multiple representations of subject content. The quality and relevancy of teaching and learning lies with lecturers, and thus, the importance of preparing them to anticipate and not simply respond when there is a pandemic. There is clear evidence that the implementation of digital education provides a meaningful and affordable alternative to the "brick and mortar" classroom. Figure 2 illustrates the complexity of interactions in digital learning, which requires rethinking teaching and learning because it differs from a passive

teaching environment where an educator assumes the position of knowledge authority.
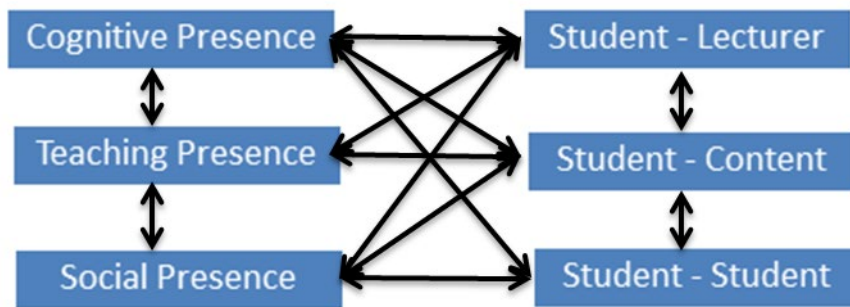

Figure 2: Integrated elements of CoIs as enablers in productive learning communities

Providing multiple perspectives within the community is a strength of the CoI framework as all participants are equally important (Restall and Clark 2021), and Figure 2 demonstrates the interdependence of cognitive, social, and teacher presence. The intersection of cognitive, social, and teacher presence has the potential to increase student engagement and encourage collaboration both in an asynchronous and synchronous space. While this potential is huge, a certain amount of training and development should be provided upfront to be able to bring these three elements together to enrich the online learning experience. In the socio-epistemological orientation landscape, the emphasis is continuous learning through web-based systems in virtual communities where people come together to collaborate and develop cognitively. Informal learning also take shape through participation in different communities that are open to all who wish to participate.

These communities use social software such as discussion boards, virtual worlds, blogs and digital learning platforms (McLoughlin and Lee 2007). Cope and Kalantzis (2010, 3) argue that "it is the new machines of the information age that make ubiquitous learning different from heritage classroom and book-oriented approaches to learning". While ubiquitous learning is the greatest benefit of digital learning platforms, the interactivity among the lecturers, students and content enriches social, cognitive and teaching presence. Within a CoI, feedback from different perspectives is sustained. Hounsell (2007, 111) argue that well-crafted and targeted feedback can enhance learning by "accelerating learning, optimising the quality of what is learned and raising individual and collective attainment". Recursive feedback is necessary in digital education as it supports effective teaching and is initiated through feedback, dialogue, reflection and democratising relations (Smith, McCarthey, and Magnifico 2017). According to Okita and Schwartz (2013, 381), educators "gains feedback by observing how the pupil applies what has been learned in a new performance context". Again, it is central to feedback how students

interact with content in an iterative process and that the lecturer map students' contribution back to the lesson objectives.

Students' participation in both synchronous and asynchronous spaces as part of a community increases their learning opportunities as they reflect on the issue being discussed and get multiple opportunities to reflect on different perspectives as they dialogue with their lecturers and peers. The extended discourse enables dialogic feedback and multiple opportunities to engage with the subject content and in turn lead to critical thinking and introspection (Martin 2020). However, to enable dialogic feedback requires multimodal forms of content presentation. According to Martin (2020, 17), quoting Yang and Carless (2013, 286), dialogic feedback "places an emphasis on dialogue and attempts to avoid one-way transmissions of feedback which frequently arises from the dominant structural constraint of written comments on end of course assignments". Given the analysis presented in this article, there are complex factors to consider, such as multimodal digital resources, systematic approach and ubiquitous teaching and learning, in order to realise digital education.

CONCLUSION

From a digital education researcher's point of view, digital education has the potential to revolutionise higher education in developing economies by creating more inclusive learning environments. There is no doubt that digital education is enabled through digital learning platforms such as Learning Management Systems and Canvas, but they are augmented by the human touch. Underlying the human touch in digital education is digital capital and usability to ensure differentiated instructional activities. Usability is "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specific context of use" (Bevan, Carter, and Harker 2015, 144). Hence, empirical research on digital education "needs to be pursued more vigorously along social scientific lines, with researchers and writers showing a keener interest in the social, political, economic, cultural and historical contexts within which educational technology use (and non-use) is located" (Selwyn 2010, 66). This is obviously necessitated by the massification of higher education and the COVID-19 pandemic where students are studying in solitude. Mentis (2008, 217) points out that there must be "reciprocal interaction between technology and pedagogical practices" to create learning communities where students are able to engage in and create collective intelligence. The potential benefits of digital technologies in higher education are enormous, particularly for the creation of ubiquitous learning communities (Dlamini 2022; McLoughlin and Lee 2007; Sarker et al. 2019).

However, digital capital is necessary to prevent a digital underclass. This can be achieved

through continuous professional development activities on digital skills and digital pedagogies. Accepting the pedagogical affordances of the Internet and the LMS both educators and students require formal training on the use of the Internet and the LMS as pedagogical tools to enable metacognitive confidence as members of the CoI. This will enable educators to use a variety of digital technologies and mediums to enable an inclusive classroom. Using a variety of digital technologies and mediums supports multiple ways of presenting information and content. Furthermore, CoIs should always be a safe space for all students to participate freely and to remotely interact and engage in an environment that support both synchronous and asynchronous engagement. Finally, the learning environment should promote cooperative learning, peer learning, and reciprocal teaching where the elements of a CoI and the interaction equivalency theorem align. Throughout the article it was clear that digital equity is a human right and that it is necessary to promote digital inclusivity.

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