

Designing for Inclusion within the Learning Management System: Social Justice, Identities, and Online Design for Digital Spaces in Higher Education

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Abstract—The aim of this paper is to propose pedagogical design for learning management systems (LMS) that offers greater inclusion for students based on a number of theoretical perspectives and delineated through an example. Considering the impact of COVID-19, including on student mental health, the research suggesting the importance of student sense of belonging on retention, success, and student well-being, the author describes intentional LMS design incorporating theoretically based practices informed by critical theory, feminist theory, indigenous theory and practices, and new materiality. This article considers important aspects of these theories and practices which attend to inclusion, identities, and socially just learning environments. Additionally, increasing student sense of belonging and mental health through LMS design influenced by adult learning theory and the community of inquiry model are described. The process of thinking through LMS pedagogical design with inclusion intentionally in mind affords the opportunity to allow LMS to go beyond course use as a repository of documents, to an intentional community of practice that facilitates belonging and connection, something much needed in our times. In virtual learning environments it has been harder to discern how students are doing, especially in feeling connected to their courses, their faculty, and their student peers. Increasingly at the forefront of public universities is addressing the needs of students with multiple and intersecting identities and the multiplicity of needs and accommodations. Education in 2020, and moving forward, calls for embedding critical theories and inclusive ideals and pedagogies to the ways instructors design and teach in online platforms. Through utilization of critical theoretical frameworks and instructional practices, students may experience the LMS as a welcoming place with intentional plans for welcoming diversity in identities.

Keywords—Belonging, critical pedagogy, instructional design, Learning Management System, LMS.

I. INTRODUCTION

LMS have been a common form of educational technology in universities internationally for some time. However, the consistency in *how* they are used and to what capacity varies widely, not necessarily by institution, but by individual faculty and instructors. The author knows this both as a past and current student, at universities in both the US and Canada, and as an instructor.

Since the onset of the pandemic, the author posits that the LMS has become a *place* more than a technology. A *place* that encompasses the learning environment, information and interaction of faculty to course and student, and student to course and faculty. *Place* has become more intangible in some

ways and more important since the pandemic. University communities, especially having faced more virtual learning, need solid places for academic community, instruction, and communication. We have few options to currently gather, with most of our life and engagements online. So, faculty need to think about the *construction of the LMS as a place*, as well as a repository for educational materials, a space for education, learning, and engagement. Reflexive practice would have educators tuning into how learning is experienced by the student. Therefore, it is important to thoughtfully consider the LMS as a *place*, and the student experience, the environmental factors, and the inclusivity of the LMS in its design and delivery. This paper will look at these issues and present models of curriculum design and pedagogy for the LMS, as well as activities and LMS design features instructors can use to increase the welcoming, approachability, accessibility, and equity of the LMS for students.

II. BACKGROUND

A. Covid-19 and Mental Health

In general, university students and mental health issues have been a growing concern for higher education [1],[3], and this is a concern across nations [2]. Pre-pandemic students, in particular doctoral students, have been noted to have “psychological distress”; one in every two are at risk of developing depression [4]. Mental health of doctoral students continues to decline with both anxiety and depression plaguing these students [5].

Since the pandemic, mental health issues have magnified [6]. The increase in isolation and impacts on student mental health is a growing concern, requiring mental health services and more frequent check-ins by supervisors [7], and continues to be a pressing issue for institutions of higher education [8].

The psychosocial impacts of COVID-19 have been surfacing with studies published as early as March of 2020 [9]-[11]. A study conducted within the general population in the UK on adults 18 years and older, with a focus of COVID-19 [12] looked at several aspects of well-being. The study looked at various social demographics, previous physical or mental health conditions, living with COVID-19 status, COVID-19 related experiences, media/information consumption, COVID-19 related concerns, mental health variables like major depressive disorder, sleep quality, other risk or protective

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psychological factors, e.g., emotional dysregulation, loneliness, social support, and meaning in life. The quantitative data was collected using validated scales. Data collection through quantitative means, done in multiple countries, are similar to other studies done on doctoral students. Anxiety and depression, loneliness, and the outreach and/or need for support is being exacerbated by the pandemic is supported in other studies [9]-[11], [13], including in the qualitative data from a mixed methods study [14].

College students have been increasingly susceptible to mental health issues due to the pandemic, and/or mental health issues present have increased the vulnerability of mental health issues [15]. Aslan et al.'s study on 14 universities across Turkey confirmed that generalized anxiety increased, and students were experiencing a low satisfaction with life. They concluded that negative impacts on university student mental health is a high-risk plight that needs attention, observation, and further research [15].

Of the psychological variables examined in [15] one variable named was anxiety. Reference [15] stated that over half the university students studied "presented clinical symptoms" of generalized anxiety disorder (GAD), and met the criteria for depression, over half of the students showed "low satisfaction with life", and 71% "reported high levels of perceived stress" (p.7, 9).

While there are mental health supports and services that campuses can provide, including telehealth systems, there may be more that universities can do to address both isolation and loneliness that have definitively been negative impacting factors on university students. One study [16] suggests ensuring in online spaces, there are synchronous sessions or activities to engage and support students.

B. Belonging – A Benefit for Students

Sense of belonging has been an important factor studied for students' well-being and success for a while [17]. Since the onset of COVID-19, a *place* to belong has changed with students online. In previous work [18] the LMS as a third space between academic and personal, a social academic space has been explored as a positive mediating factor for doctoral students [14]. The third space, as an online space, neither social media nor a course, can be created using educational technologies common to universities, such as the LMS, e.g., Canvas, Blackboard, Moodle, etc.

Belonging is an intangible experience in an individual, yet its impact is far reaching towards the wellbeing of students. The most recent study on sense of belonging and COVID-19, at the time of this writing, is by Mooney and Becker [19]. Their study of belonging on college students lasted three years, beginning prior to the pandemic and throughout the pandemic. This study is important when discussing the LMS, critical theory and designing for socially just spaces and inclusion as these authors looked at various groups, and intersectionality of groups, in the areas of gender, sexual orientation, race and ethnicity, people with disabilities, and cultural characteristics. Reference [19] utilized the belonging definition from the work by [20, p.711], as cited in [19, p.612]; sense of belonging or "belongingness"

is defined as "one's personal belief that one is an accepted member of an academic community whose presence and contributions are valued".

Since sense of belonging has been studied with student populations in higher education, as essential and a factor in student retention and success, this factor needs to be considered in the pedagogy we use, how content is presented, both from an instructional perspective and student engagement perspective, and in faculty-to-student and student-to-student interactions. As we know, for a long period of time, "experts have...said students' sense of belonging matters. Being valued matters. A curriculum relevant to their lives matters" [21, p.2].

C. Critical Theories and Pedagogy

Critical theories and pedagogy are needed in adult education as a "dominant and legitimate interpretive perspective in the field, one that should be seen as relevant and helpful by adult educators who regard themselves as mainstream practitioners" [22, p.x]. The desire to create inclusive pedagogies and instructional design is not new. Through feminist theory, critical theory, and models, there are some consistent elements of critical pedagogy, i.e., collaboration and communication. Indigenous theory adds a third component -community. The difference between Euro-centric Western pedagogies and non-Western pedagogies is in the ideal and view of the self as an individual (Western) versus a collective part of humanity, nature, interwoven in various strands of being (non-Western). In thinking about inclusive pedagogies and inclusive instructional design, by the very nature of the word "inclusive", there needs to be a shift from the very ontological notion of how faculty and students create learning spaces and engage as faculty and students in the acquisition of knowledge and putting that knowledge into the world. It leaves one to wonder what would happen if faculty and students took theory of teaching and learning and dismantled the very notions behind it to ensure its inclusivity. If instructors look at inclusivity as all beings included regardless of race, identity, religion, sexual preference, gender, ability, partnered status, the construct of family and aloneness, the need to modify or approach these models through a widened lens of what inclusion is and how it is constructed, then deconstructing the existing learning environments and ideals becomes prioritized.

Sense of belonging's value to university students' learning and retention has been proven in studies [17]. Since, the onset of the pandemic, and the move to online education, we suggest that sense of belonging is going to be an integral part of our pedagogies, online spaces we seek to create for students, and instructional design moving forward. Sense of belonging is essential for socially just learning environments and has been studied as such [19], [20], [23]-[30]. Internal factors to consider in pedagogy and design are "students' experiences and backgrounds, people (colleagues) and professors, place/environment (physical) and virtual, context (such as the discipline, and part-time/full-time status) and "external factors (such as local, regional, and global landscapes, and time" [19, p.612]. We would add to this list peers, other students who are in the same student experience, which may or may not be

categorized as colleagues. A colleague is defined as “someone” one “works with” whereas a peer is described as an “equal” in “status and experience” [31]. Additionally, a topic that [19] brought up that the author deems extremely important to belonging is the use of language and terminology. While they are referring to their research instrument, and ways faculty move and model with pedagogy and design should leave open various uses, interpretations, and openness to learning and changing the language that educators use. Bringing students into the conversation and making space for them to identify and use terms that are inclusive may create more open spaces for the learning community to learn and grow into a deeper and more inclusive community.

In Becker and Mooney’s study [19], findings that included COVID-19 [19] at a “large, European, research-intensive university” (p.613), “had a larger impact on the sense of belonging of all students in the space of a few months than...otherwise observed” in the previous two years (p.617). Other noteworthy findings regarding sense of belonging and pedagogy/instruction from the same research, in thinking about student populations, were these: for sense of belonging with pedagogy and instructional design 1) women and men who *did not associate with any minority group* experienced a *decrease in their sense of belonging*, men more than women, 2) women who identified as being part of a minority group had the largest increase in sense of belonging post COVID-19 onset and 3) men identifying the same way had the largest decrease in “sense of belonging post-COVID-19” (p.617). The study did not specify why women and minority groups experienced higher sense of belonging yet asserted some of the reasons could be the Black Lives Matter movement, being online from a home environment may provide more supports, and findings that support online environments as being more inclusive (p.617).

1. Feminist Theory and Othering

Early on when feminist theory began to emerge, in a binary, patriarchal view, a woman was the “other” and from a position of inferiority [32]. The reality is that “othering” has had a contagion of observability is widespread for many peoples, cultures, identities, especially as they seek to be visible, with all the rights afforded to the dominant gender and culture, and dominant groups become more aware of those struggles of “the other”. While going forward, we see how many missteps have been taken and how the more we embody who we want to define ourselves created to be, the more othering has prevailed.

Feminist theory, and critical theory, have been foundational in the development of other critical theories for diverse populations which aim to put humanity and collectivity at the forefront, balancing power, voice, and countering hegemony,

2. Inclusion as Portrayed by Indigenous Theory

Education is seen as an avenue, pathway for “social good”, yet for students who are marginalized due to social economic status and resources, class, racial/ethnic identity, sexual identity, gender identity and more, it is not experienced for all students as a social good for all [21, p.1]. Given the traumatic legacy of forced boarding schools for indigenous youth, for

example, author, attorney and speaker Gyasi Ross has noted that campuses are more likely experienced as sites of punishment, not education, for Native students. These inequities in education are not particular to one part of the globe; it is these goal challenges that have located “education... at the core of deep change required in a world openly grappling with issues of power and oppression and growing nationalism” [21, p.1]. This *Toronto Star* piece, though written for a Canadian audience, provides powerful ideas for educators to embrace regardless of country or culture; class creates barriers of power and access, while increasing marginalization. Additionally, land, and whose land is it, is an important question or point of contention. It is a key factor in undergirding class differences. How land relates to creating culturally inclusive spaces is in the value of land, all its elements, the site for community, collaboration, and ways of communication that provide opportunities (or not) for collective ways of knowing, being, and sharing knowledge and resources in education.

Language is not merely words, nor a tool to communicate with others. Learning a language also meant learning “...culture, relationships, history. Language was just a door to that learning, and that provided me with a much greater understanding of the country” [21, p.2], “enhancement” of curriculum through collaborations with the community and “knowledge keepers” [21, p.2]. The teaching is to acknowledge harm that education has caused for some and to acknowledge the -isms that exist for race and ethnicity, as well as other identities; the experiences are not all the same [21]. In this sense, one makes the invisible, visible, acknowledges poverty, and acknowledges ancestral history and ownership of land. The standard is to require these varied perspectives of the diverse cultures and peoples in the curriculum [21, p.2].

Model in Fig. 1 suggests integrating non-Western pedagogical framework with the Indigenous pedagogy which encompasses connectedness, collaboration, and community with the social materiality approach of relationships with those parts of the learning that are non-human, like the LMS. Through iterative design and flow, all parts of the learning apparatuses and teacher and student are interconnected in the process with reflexive practice igniting the cycle again. An instructional designer or teacher can begin anywhere in the model and move fluidly from one part to the other in whatever is needed for the pedagogy, the learning classroom, the learning community in the moment. The circles are open to reflect unknowing that educators are still uncovering and learning about students, pedagogy, and design, and to reinforce the openness and flexibility of the model.

3. Othering and Sense of Belonging

For some time “Othering” has been a practice, a weapon, a way to push someone, a group, to the outer circle. Othering and sense of belonging do not go hand in hand; they are in opposition to each other. An instructor needs to decide what kind of environment they want to create, who writes the texts they are using, whether assessments are conducive to learner strengths, and contexts (both external and internal). And the goal of the assessment, a bell curve of 68% means 32% fail; this

is not very inclusive of a class population and may reflect more on the failures of the system that have influenced student learning. From a critical theory and sense of belonging lens, giving choice in learning assessments may help all learners achieve and express their learning in ways that decrease anxiety and offer the instructor more insight into the learning gained.

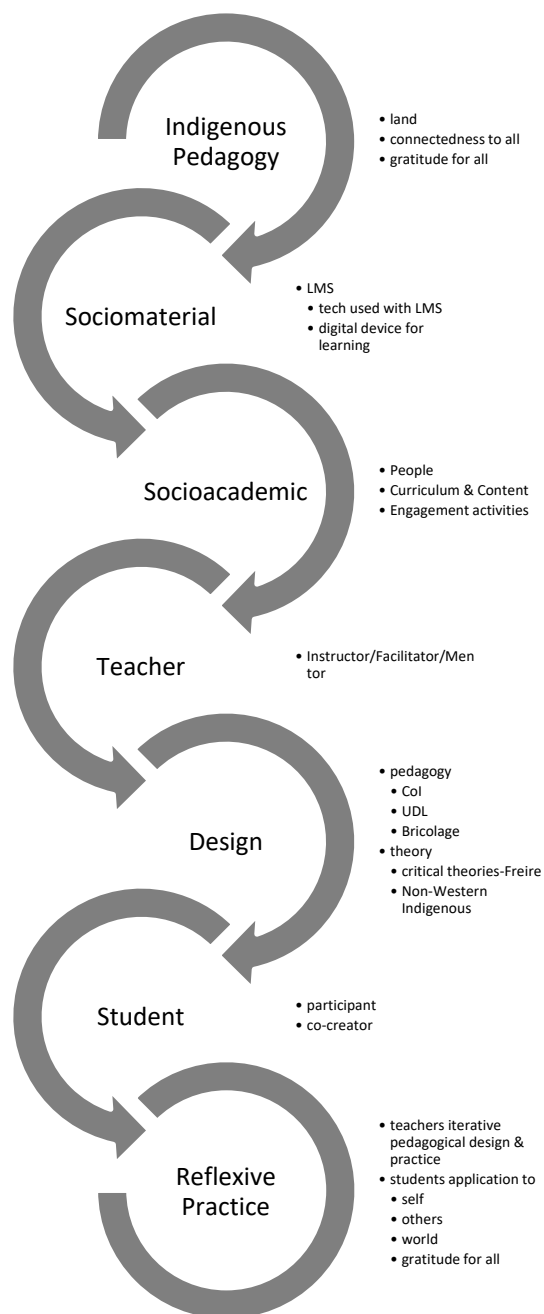


Fig. 1 Creating Inclusive Ideals: Pedagogy & Design Model (2021): An integrated theory and praxis approach to LMS Design

D. Land Acknowledgements

In this paper, the references to indigenous ways and cultures are to highlight examples of cultures that are collective, rather than individualistic, as guides in designing courses. The

pandemic has taught us that students (faculty and staff) are impacted by the wider context of their whole lives. There is no superpower or superhuman who can compartmentalize to the point of no impact of isolation, death of a loved one, lack of food, shelter, being contained and confined in one place of personal, academic, work life. Acknowledging the tribal lands that our institutions of higher education are on, and the history, is one way of reminding all of us of the outside world, of the interconnectivity of all life forms; it broadens our perspective of where we are, who we come from, who others come from. It offers an opportunity to begin to reconcile with oppressive histories and current inequities. It is a way to connect outside of our daily context to a larger connected perspective.

Land acknowledgements can be something an instructor models with an opening of their course or on the home page of their LMS site, and/or instructors can ask students to share the history of the land they are from, or in the case of the pandemic and/or online learning, the land where they are learning from. As an introductory step, a model of action and an ask for action, students can begin to feel the grounding of connection to place (place as in land, and the combination of place in the LMS – as a weave and texture, a blanket of many colors representing different places and identities while honoring the roots of land and the indigenous peoples who inhabited the lands).

E. LMS and Community

The LMS as a Third Space has not been studied. Nor has the capabilities of the LMS as a gathering place been considered in studies. Instructors look to Facebook and other social networking modalities to create learning communities *instead* of the LMS, yet there are risk factors with social media that the LMS protects against by the way it is obtained, licensed, and utilized on university campuses.

Social media platforms are open to the public, even “private” pages and accounts can be entered by posers or through someone friending someone. To maintain the privacy of a social media site, like in Facebook, there would need to be agreements and consistency in how each user set up their privacy settings. With the LMS, it is university owned. An instructor or student must request the LMS space. Only people with an institutional address can be invited into the LMS or with an affiliation to a specified course. All communication, assignments, information shared by faculty or students are housed within that LMS space. It is not for public consumption. Instruction, sense of belonging, and community cohesion benefit from examining how the LMS is underused and exploring ways faculty and students, academic programs, can construct LMS spaces. This provides for even greater familiarity with what students can expect when entering a site, especially in ways that are welcoming and inclusive. Here are some examples of *codification of inclusive LMS instructional design*:

- Welcoming Students
 - Third Space theory-equalizing power and awareness of dominance towards making space for all identities and cultures
 - Through messaging from the instructor
 - Land acknowledgement and use of languages

- Inclusive symbols and images
- Engagement activities which foster introductions and a base for community building among students
- Weekly online homework hangout, help, chat with the instructor present, and availability of breakout rooms
- Course Texts and Information Engagement
- Multi-Media
- Flipped Classroom
- Discussion Board Design
- Students approach discussion of course, text/learnings/ activities from a voluntary or assigned perspective
- Course Activities
- Experiential engagement with learning
- Technologies and features of the LMS to facilitate interactions or learning
- Brain breaks, Coffeehouse
- Activities for the mind, soul, wellbeing
- Topics of interest or pressing needs students want to talk about
- Assessments
- Student choice in assessment for a given assignment
- Multiple choices within the LMS for expression of student ideas, thoughts, assignment completion

F. New Materiality and the LMS

In light of Latour and Foucault's view on new materiality, the belief that humans are not more important than the non-human elements, the author leans on the interpretation of the importance of new materialism in the question of "how things are constructed". There is a punctuated importance placed on the "relational dimensions of human-nonhuman encounters" [33]. There are different definitions and perspectives of what learning design or instructional design is in the LMS, from materials for instruction and activities [34], [35], the activities that involve student learning [36], [37], and the idea that learning activities for students is not the learning [38].

Whether teachers are involved in design work or not is a variable. References [39] and [40] describe design as including the following: "learning tasks, supportive physical and digital environments, forms of social organization, and divisions of labor" (as cited in [41, p.8-9]). There are two perspectives of design that [40] touts: educational design, "rarely aiming to create brand new things, but to select and configure existing things into new entanglements", and "the other is that educational design is not a fixed product, but is open for students to adapt, interpret and customize" (as cited in [41, p. 9]).

Design is iterative and continues as a process which "includes the enactment of the design in use" [42], [43, p.208]. According to [41], teachers who are designers are more than "experts" rather they are also considered "process mentors and learning companions", and students contribute as users, through reflection and as "co-designers" (p.9). Students and teachers within educational technology design and use create socio-academic connections with human elements, design, elements, and the educational technology itself. "Pedagogical design with LMS can thus be understood as the process that becomes

realized in the interplays between humans and digital" which are both "sociomaterial and socioacademic" interactions [41, p.9].

The "materiality of learning" is gaining recognition, with the "sociomateriality of learning" in more "empirical research of educational practice" [44], [45], as cited in [41, pp.9-10]. According to Li [41] the sociomaterial lens does not compete with other theories, it works interdependently (p.10). This highlights new materialism well to show that learning apparatuses flow between human, non-human elements as part of the experience of the design and learner engagement and activities.

We include new materiality as in indigenous ways of knowing and being; there is gratitude offered for everything and the belief that everything is connected, human, non-human, in nature, and even gratitude for what might be forgotten [46]. By keeping consistent to this value and appreciation for all, educational technology and how we both create the apparatuses of environment, learning materials, feel of the space and invitation of the student to approach and engage is crucial in our LMS set up.

Levi-Strauss originated the idea of bricolage [47]. As introduced by Orlikowski and Scott [48], the concept of *bricolage* is the analytic tool to identify the situation where people made do by putting whatever they have in availability. "Johri [44] expands the term of bricolage to the sociomaterial bricolage analytic concept. The sociomaterial bricolage encapsulates the idea that workers' practices emerge with pre-existing tools that are available to them, that is, they engage in sociomaterial bricolage. In other words, sometimes, people behave differently by trying out affordances they find at hand in situated contexts, rather than sticking to a planned approach. The sociomaterial concept of bricolage can be useful to understand teachers' incidental design behaviors with the presence of LMS. This concept might help in the efforts to explain why there are dissonances between teachers' conception of LMS and their approach to design" [41, p.11].

"Hereupon, through the sociocultural approach, the LMS could be seen as the mediator in designing and in the enactment of design output" [41, p.12]. "The sociomaterial perspective and sociocultural perspective are different while their strengths are complementary" [41, p.13].

III. APPROACHING THE LMS FOR INSTRUCTION AND COMMUNITY

The LMS is the most highly utilized educational technology for higher education [49], [50]. The LMS has increased in notoriety and use, in higher education related to its value and "support of teaching and learning" [41, p.V]. The LMS is a valuable digital, educational tool, but the effectiveness of engaging learners and creating communities is dependent on the pedagogy and instructional design [41]. There is an advantage to using an LMS and realizing that the educational technology is only as stagnant and stationary as the instructor lets it be. An instructor can choose to use the LMS as a repository, that holds the syllabus, resources, assignments, grades, emails... useful, yet lifeless, Or the instructor can have a relationship with the

LMS. An instructor can determine the relationship and how to introduce the LMS to students and offer them ways to interact with the LMS that engages them with others, experiential learning, and reflection of learning, as examples of critical pedagogies applied.

Critical pedagogies work against power over, colonization, and invisibilizing others who do not fit in the hegemonic lens of policies, values, power, and greed, which value some over others based on difference. This is liberatory pedagogy [51] in action. If education is for the social good, critical pedagogy is a way to embed accountability to the readings chosen for courses, assessments of student knowledge, and the way faculty interact with students and the environment created for students to relate to faculty and each other.

Andragogy was developed by Knowles [52] to recognize that adults, and designing pedagogy for adults, should mirror the life experiences, knowledge (both formal and informal learning) students bring with them to their education and education settings. Since belonging is connection and perceived connection by students, it seems that pedagogy or andragogy should be set in ways that have the collective community, including their lived experiences, in mind. Drawing from decolonization principles, equalizing power in engagement of knowledge and meaning making can offset the hierarchy of students to faculty, and competition between students, in ways that create divide not personal learning goals and growth.

To move towards a critical theory model, one starts with the outcomes, what an instructor wants students to gain in their learning experiences, much like a logic model, and then works backwards to what one needs to attain an end of optimizing the learning environment with educational technology (LMS), communication, knowledge building, engagement with knowledge, and sense of belonging.

The Community of Inquiry Model (CoI) was developed in 2000 [53] as a model for online learning. However, over time, it has become a model that is widely used in online, hybrid, and face to face education. The basic idea of the CoI is that the educational experience for the student is in the center of three overlapping presences: Social Presence, Teaching Presence, and Cognitive Presence. Social presence is the student perception of community relating and building within the class environment. This includes formal and informal interactions the student has with the LMS and assignments, discussion boards, wikis, blogs, etc., between students, and student to faculty interactions and vice versa. Cognitive presence is the student perception of interaction with the content, the information presented for knowledge building. Teaching presence is the student perception of the student to the instructor and their experience of how the instructor facilitates the class and learning. Technology presence, a more recently added presence in the model, is the student perception of their interaction with the technology, and for the purposes of this paper, it is the LMS. Thinking intentionally about the Community of Inquiry presences (an instrument measures the various aspects of each

presence specifically) during LMS design has the potential to enhance learner equity and inclusion. Measuring sense of belonging in relationship to designs using CoI will further inform the relationship between CoI and increasing sense of belonging in *the place* of the LMS.



Fig. 2 Community of Inquiry Model [56]

A model which depicts a “personalized learning approach” to online education is the *Learning Camera* [57]. Developed as a model for human services students in online education transitioning to professionals in the field, this model is transferrable to other online learning environments and settings. In particular this model embeds a social justice lens and builds out student knowledge and academic to professional development through a constructivist lens [57] including students as co-constructors in their learning. Personalized learning is important to inclusion as it structures the learning experience in line with the “strengths, needs, and interests” of student learners while empowering and developing the student voice and the student choice in methods and experiences of learning [57]. With this model the instructor role changes from the role of instructor to one of mentorship, advisor, coach, and evaluator [57, p.337]. The LMS comes into this design as technology is seen as an integral part of the learning design and as a means towards diverse instruction and diverse supports within the learning community [57].

IV. INCLUSIVE INSTRUCTIONAL DESIGN

A. Creating Inclusive Learning Environments: A Need

Inclusive learning environments are a need if higher education is to equalize and optimize online learning for students [19]. Studies have shown that measuring and designing for sense of belonging for students is imperative to inclusion for all identities as it influences student retention and motivation, persistence and achievement [19, p.617].

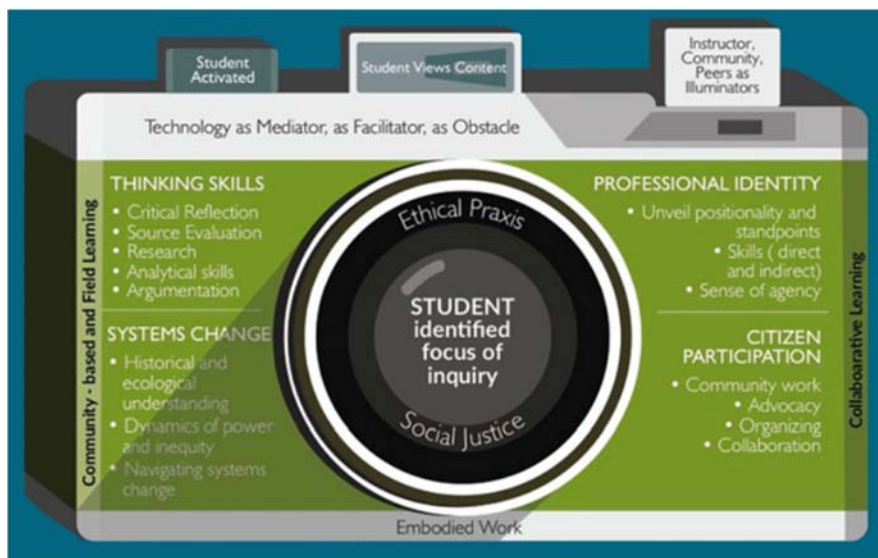


Fig. 3 The learning camera [57]

B. Use of Liberating Structures and Cultural Activities

Reference [54] defines direct instruction as recognizing “the continuous need for the expertise of an experienced and responsible teacher who can identify the ideas and concepts worthy of study, provide the conceptual order, organize learning activities, and guide the discourse, offer additional sources of information, diagnose misconceptions, and interject when required” (p.60). We also argue that while the responsibility is on the instructor, there is an additional responsibility of the instructor to unmask the hierarchy of Western ideals and individualism, and invite students into an environment which is secure with educational content, yet recognizes that the environment includes the sociomateriality and sociocultural aspects in the learning community. In order to gain the rich advantage of all identities in engagement and participation, instructors must be aware of power and privilege in the society, in education, and work with students to deconstruct that in the LMS environment and in all interactions. This is to create space for students to create their own third space of discourse, connection, and engagement with each other, the content, the instructor, and the themes which arise from daily life and society that are not exclusive of the education process or environment. One way to do this is through the use of liberating structures; [55] offers over thirty activities to unbox people and environments and allow groups to be collaborative and innovative. These activities dispel the stale and often hierarchical ways that groups interact which leave some participants silent. In addition, getting the group to synergistically interact with their ideas and each other produces a creativity and deeper meaning to learning. Other ways are to use activities which allow students to bring who they are and where they are from into the environment and the discussions. Instructors need to make space for this and be aware of any dominance occurring, to work against that dominance, so all students, cultures, identities, and voices are welcomed,

validated, heard and integrated into the curriculum, discourse and reflection.

V. THEORY INFORMING PRACTICE

LMS can provide a very real and practical venue for student third space. We know that COVID-19 and sheltering safely has had a challenging impact on students’ mental health, and on their sense of belonging which also influences their mental wellness. Incorporating particular theoretical lenses in planning and design of LMS can enhance inclusion: critical theory/pedagogy, feminist theory/pedagogy, indigenous pedagogy/practices, and new materiality. The example provided was a pre-pandemic LMS structured for student staff orientation which resulted in increased feelings of belonging and community connection. Thinking about LMS as a third space and intentional community of practice will enable students to connect in a community that transcends a course, a living space, and a campus work setting. In this way, campuses can optimize an underutilized educational technology during and post the pandemic constraints.

REFERENCES

- [1] Z. Meleo-Erwin, B. Kollia, B., J. Fera, A. Jahren, C. Basch, (2021). Online support information for students with disabilities in colleges and universities during the COVID-19 pandemic. *Disability and Health Journal*, 14, 1-5. Retrieved from: <https://reader.elsevier.com/reader/sd/pii/S193665742030145X?token=156151EE7AA3D888605E36BD45F034EAA9B4C4B2F484AAE3ECF7721873BB82651934E698839A51B1D554FA78257859B2&originRegion=us-east-1&originCreation=20210423203435>
- [2] A. Qazi, K. Naseer, J. Qazi, H. AlSalman, U. Naseem, S. Yang, G. Hardaker, A. Gumaei (2020), October 13). Conventional to online education during COVID-19 pandemic: Do develop and underdeveloped nations cope alike. Europe PMC: ELIXIR.
- [3] K. Storrie, K. Ahern, A. Tucket, A. (2010). A systematic review: Students with mental health problems – A growing problem. *International Journal of Nursing Practice*, 16, 1-6. Blackwell Publishing Asia Pty Ltd. Doi:10.1111/j.1440-172X.2009.01813.x.
- [4] Katia Levecque, Frederik Anseel, Alain De Beuckelaer, Johan Van der Heyden, Lydia Gisle, Work organization and mental health problems in PhD students, *Research Policy*, Volume 46, Issue 4, 2017, Pages 868-879,

- ISSN 0048-7333,
<https://doi.org/10.1016/j.respol.2017.02.008>(<https://www.sciencedirect.com/science/article/pii/S0048733317300422>)
- [5] Nature, (2019, November 13). (editorial). The mental health of PhD researchers demands urgent attention. *Nature: The international journal of science*, 575, pp.257-258. Springer Nature Limited.
- [6] C. Woolston (2020, August 18). Signs of depression and anxiety soar among US graduate students during pandemic. *Nature: The international journal of science*, 585, pp. 147-148. Springer Nature Limited. Retrieved from: <https://www.nature.com/articles/d41586-020-02439-6>
- [7] M. Douglas (2020, March-April 2021). Covid-19 is hurting PhD students' mental health. UA/AU University Affairs: Affaires universitaires. Retrieved from: <https://www.universityaffairs.ca/magazine/>
- [8] F. Germani (2020, October 10). The mental health of PhD students is at stake: scientific journals should take the blame. *ZME Science*. Retrieved from: <https://www.zmescience.com/other/pieces/journals-to-blame-poor-phd-mental-health-0432/>.
- [9] W. Cao, Z. Fang, G. Hou, M. Han, X. Xu, J. Dong, J. Zheng (2020, March 14). The psychological impact of COVID-19 epidemic on college students in China. *Psychiatry Research* 287, 1-5.
- [10] K. Gross (2020, March 9). I'm worried...Higher education isn't focused at all on COVID-19's psychological toll. *New England Higher Education Board Journal*. Retrieved from: <https://nebhe.org/journal/im-worried-higher-education-isnt-focused-at-all-on-covid-19s-psychological-toll/>
- [11] Healio (2020), S. Lipskon (2020, April 8). College students and increased anxiety. COVID-19's mental health effects by age group: Children, college students, working-age adults and older adults. Retrieved from: <https://www.healio.com/psychiatry/practice-management/news/online/%7B250e2c9c-e510-4109-bb84-024660539c08%7D/covid-19s-mental-health-effects-by-age-group-children-college-students-working-age-adults-and-older-adults>
- [12] C. Armour, McGlinchey, S. Butter, K. McAloney-Kocaman, K. McPherson (2021). The Covid-19 psychological wellbeing study: Understanding the longitudinal psychosocial impact of the Covid-19 pandemic in the UK; a methodological overview paper. *Journal of Psychopathology and Behavioral Assessment*, 43, 174-190.
- [13] Laura Ihm, Han Zhang, Alexandra van Vijfeijken, Mark Waugh, (2021, March 11). Impacts of the Covid-19 pandemic on the health of university students. *Perspective, International Journal of Health Planning and Management*, 1-10. Doi:10.1002/hpm.3145.
- [14] Christina Van Wingerden (2021) Research study doctoral student experiences of peer belonging and isolation pre and post Covid 19: Canvas as a third space. Simon Fraser University: Burnaby, B.C. Canada
- [15] I. Aslan, D. Ochnik, & O. Cinar (2020). Exploring perceived stress among students in Turkey during the Covid-19 pandemic. *International Journal of Environmental Research and Public Health*, 17, 8961;1-17doi:10.2290/ijerph17238961.
- [16] K. O'Neill, S., Reinhardt, K. Jayasundera (2021). What undergraduates say about choosing online or in-person course: Qualitative results from a large-sample, multi-discipline survey. *Higher Education Research & Development*. doi: 10.1080/07294360.2021.1896484.
- [17] Terrell L. Strayhorn (2019). *College students' sense of belonging: A key to educational success for all students, (2nd ed)*. New York and London: Routledge, Taylor & Francis Group.
- [18] Christina Van Wingerden, (2021) World Academy of Science, Engineering and Technology Conference Proceedings, Istanbul, Turkey.
- [19] C. Mooney, B. Becker. (2021), Investigating the impact of the Covid-19 pandemic on computing students' sense of belonging. In *Proceedings of the 52nd ACM Technical Symposium on Computer Science Education (SIGCSE, '21), March 13-20, 2021, Virtual Event, USA*. ACM, New York, NY, USA, 7 pages. <https://doi.org/10.1145/3408877.3432407>.
- [20] C. Good, A. Rattan, A., & C.S. Dweck (2012). Why do women opt out? Sense of belonging and women's representation in mathematics. *Journal of Personality and Social Psychology*, 102(4), (2012), 700.
- [21] Inuit Tribe, (2019). An education without oppression benefits everyone. Here's how to get started. (2019, Sep 29). *Toronto Star* Retrieved from <http://proxy.lib.sfu.ca/login?url=https://www-proquest-com.proxy.lib.sfu.ca/newspapers/education-without-oppression-benefits-everyone/doiview/2298976183/se-2?accountid=13800>.
- [22] S. Brookfield (2005). *The power of critical theory: Liberating adult learning and teaching*. San Francisco, CA: Jossey-Bass.
- [23] L. RM Hausmann, J.W. Schofield, R.L. Woods (2007). Sense of belonging as a predictor of intentions to persist among African American and white first-year college students. *Research in Higher Education*, 48(7) 2007, 803-839
- [24] M.J. Stebleton. K.M. Soria, Huesman Jr., & V. Torres (2014). Recent immigrant students at research universities: The relationship between campus climate and sense of belonging. *Journal of College Student Development* 55(2), 2014, 196-202.
- [25] C.R. Glass, E. Kociolek, R. Wongtrirat, R.J. Lynch, & S. Cong. (2015). Uneven experiences: The impact of student-faculty interactions on International Students' sense of belonging. *Journal of International Students* 5(4), 2015, 353-367.
- [26] M.J. Stewart, E. Makwarimba, L.I. Reutter, G. Veenstra, D. Raphael, and R. Love (2009). Poverty, Sense of Belonging and Experiences of Isolation. *Journal of Poverty* 13(2), 2009, 173-195.
- [27] L. Hsui-Fen, (2008). Determinants of successful virtual communities: Contributions from system characteristics and social factors. *Information & Management*, 45(8), (2008) 522-527.
- [28] D. Kember, K. Lee and N. Li (2001). Cultivating a Sense of Belonging in Part-Time Students. *International Journal of Lifelong Education*, 20(4) (2001). 326-341.
- [29] O. Den Besten (2010). Local Belonging and 'Geographies of Emotions': Immigrant Children's Experience of Their Neighbourhoods in Paris and Berlin. *Childhood*, 17(2), (2010), 181-195.
- [30] L.H. Anderman (2003). Academic and Social Perceptions as Predictors of the Change in Middle School Students' Sense of School Belonging. *The Journal of Experimental Education* 72, 1 (2003), 5-22.
- [31] Merriam Webster. (2021). Retrieved from: <https://www.merriamwebster.com>
- [32] S. de Beauvoir (1949, 1997). *The second sex*. Trans. Parshley, H.M. NY: Vintage.
- [33] S. Reddington & Price (2018). Pedagogy of new materialism: Advancing the educational inclusion agenda for children and youth with disabilities. *International Journal of Special Education* 33(2), pp. 465-481.
- [34] D. Randy Garrison & Heather Kanuka (2004). Blending learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education* (7)(2), 95-105. Retrieved: <https://doi.org/10.1016/j.iheduc.2004.02.001>
- [35] N.M. Seel, T. Lehmann, P. Blumschein, O.A. Podolskiy (2017). *Instructional design for learning: Theoretical foundations*. Springer.
- [36] S. Bennett, S. Agostinho, L. Lockyer (2015). Technology tools to support learning design: Implications derived from an investigation of university teachers' design practices. *Computers & Education*, 81.
- [37] B. Rienties, L. Toetenel, & A. Bryan (2015, March). Scaling up learning design: Impact of learning design activities on lms behavior and performance. In *Proceedings of the Fifth International Conference on Learning Analytics and Knowledge* (pp. 315-319). ACM.
- [38] H. Beetham & R. Sharpe (Eds.), (2013). *Rethinking pedagogy for a digital age: Designing for 21st century learning*. New York and London: Routledge.
- [39] P. Goodyear (2005). Educational design and networked learning: Patterns, pattern languages and design practice. *Australasian Journal of Educational Technology*, 21(1).
- [40] P. Goodyear (2015). Teaching a design. *Herdsa Review of Higher Education*, 21(1).
- [41] Li Ying (2019, October). University teachers' pedagogical work with Canvas: An exploration of teachers' conceptions, design work and experiences with an LMS. Norway:Universitetet I Oslo. Retrieved from: <https://www.duo.uio.no/bitstream/handle/10852/73114/Pedagogical-work-with-Canvas.pdf?sequence=1&isAllowed=y>
- [42] P. Goodyear, & Y. Dimitriadis, (2013). In medias res: Reframing design for learning. *Research in Learning Technology*, 21.
- [43] C.R. Jones (2013). Designing for practice: A view from social science. In *Rethinking pedagogy for a digital age: Designing for 21st century learning* (pp. 204-218). New York and London: Routledge.
- [44] A. Johri (2011). The socio-materiality of learning practices and implications for the field of learning technology. *Research in Learning Technology*, 19(3).
- [45] E. Sorensen (2009). *The materiality of learning: Technology and knowledge in educational practice*. Cambridge, England: Cambridge University Press.
- [46] Haudenosaunee Thanksgiving Address, *Dance for all people website (2010-2021)*. Retrieved from: <https://danceforallpeople.com/haudenosaunee-thanksgiving-address/>
- [47] C. Levi-Strauss (1966). *The savage mind*. Chicago, ILL: University of Chicago Press.
- [48] W.J. Orlikowski & S.V. Scott (2008). 10 sociomateriality: Challenging the separation of technology, work and organization. *The Academy of Management Annals*, 2(1), 433-474.

- [49] A. Kirkwood & L. Price (2014). Technology-enhanced learning and teaching in higher education: What is 'enhanced' and how do we know? A critical literature review. *Learning, Media and Technology*, 39(1), 6-36.
- [50] H. Coates, R. James, & G. Baldwin (2005). A critical examination of the effects of learning management systems on university teaching and learning. *Tertiary Education and Management*, 11(19-36).
- [51] P. Freire (2000). *Pedagogy of the oppressed. Rev. 30th Anniversary ed.* New York: Continuum.
- [52] M. Knowles (1980). *The modern practice of adult education: Andragogy versus pedagogy. Rev and updated ed.* Englewood Cliffs, NJ: Cambridge Adult Education.
- [53] D. Randy Garrison, T. Anderson, W. Archer (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education* 2, pp. 87-105.
- [54] D. Randy Garrison, (2011). *E-learning in the 21st Century: A framework for research and practice (2nd ed).* London, UK: Routledge, Falmer.
- [55] Henri Lipmanowicz & Keith McCandless (2013). *The surprising power of liberating structures: Simple rules to unleash a culture of innovation.* Liberating Structures Press.