

# Inclusiveness in Instructional Design & Development of Informal Learning Experiences: From Cultural Lenses

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*This position paper focuses on inclusive instructional design and development of informal learning in online environments. The literature-based position is developed from the lenses of typology of culture, learning, and technology, universal design for learning, decolonization, and strength-based approaches. With the framework of Activity Theory, informal learning carries past and present, individual, and collective cultural and social meanings. These influence individual agency's fulfillment of various learning purposes with spaces and activities which instructional design and development can shape inclusively. This inclusiveness situates in understanding transformative needs of informal learning, is appraised by participatory cross-cultural research and inseparable from critiquing, selecting, and integrating with technologies.*

## Introduction

Informal learning, quickly merged with formal learning in the historic COVID-19 pandemic, has unveiled its potential and at the same time disclosed the insurmountable needs of recentering access, equity, and inclusion in instructional design and development. Eraut (2004) defines informal learning:

“recognizes the social significance of learning from other people, but implies greater scope for individual agency than socialization. It draws attention to the learning that takes place in the spaces surrounding activities and events with a more overt formal

purpose..." p. 247).

Because informal learning mostly takes place in social and cultural communities as learning spaces (vs. traditional classrooms), its access and inclusion can be affected by how learning needs are analyzed and determined, how learning activities, messages, and events are designed and developed, and what outcomes are measured as meaningful to learners. These processes invite an understanding of people, purpose, process, and power involved in the context (Davis et al., 2010). Equitable and inclusive access to informal learning can be affected by varied interpretations of users' various cultural and social backgrounds and status as well as by technology infrastructure and related implications.

In a digital and networked time, informal learning usually is delivered and interacted with technologies, through mobile and online options (Lai et al., 2013). Technology used in learning has its cultural stamps of dominant Western patterns, which historically have had colonial and racial preferences of how the media should be captured and presented and the tools used (Dyer, 1999; Dyer, 2000). Technology use has also generated the "digital divide", which has been more visualized through the COVID-19 pandemic around the world (Lai & Widmar, 2021; Reddick et al., 2020; Tewathia et al., 2020; Watts, 2020). These historical and culture-based assumptions and experiences have been evidenced beyond the intended equal distribution of educational resources, including the delivery of and access to instructional materials (Andreotti et al., 2015). Pedagogical assumptions of technologies can also be ignited by historic moments of abrupt reliance on technologies for connection and societal operation, as during COVID-19. Therefore, inclusive design of informal learning activities is much needed for equity and access to informal learning in the changes and from diverse cultural lenses (Ley, 2020; Roberts & McCluney, 2020).

Inclusive instructional messages and materials for informal learning have also been evolving with the ever-visualized equity movements. The Black Lives Matter movements, racial violence to Asian, Asian American, and Pacific Islanders (AAPI), social inclusion of transgender people, sustainability of indigenous cultures, and other social economic and identity issues have unveiled much of previously hidden culture-based areas that have been influencing learning outside of traditional classrooms. For instance, synchronous online communication with audio, video, and text options, used to be assumed with more connectivity offering, have been found to impose a more subtle and intense impact on the social identity of people with darker skin tones (Roberts & McCluney, 2020). Social media has been used by both sides in the Black Lives Matter and AAPI anti-racism movement (Robert, 2021; Wang, 2021). These historic moments and media footprints provide digital

artifacts and educational resources. More importantly, how these content and tools can be used in informal and formal learning urges inclusive instructional design with the proper understanding of cultural and historical contexts.

## **Theories, Approaches, and Framework**

What are fundamental factors that define inclusive instructional design for informal learning? According to Carliner (2012, 2013), informal learning is driven by the learner and relates to: *How* to participate in the process and to interpret the outcome, *Where* in terms of virtual and physical learning space and location, and *What* in terms of choosing instructional or training content. Depending on workplace training or self-motivated lifelong learning, informal learners may or may not be conscious of interaction with instruction but are implicitly or explicitly affected by their workplace or community cultures. Therefore, inclusive instructional design in informal learning should incorporate a process to understand the cultures and values of informal learners (Baumgartner, 2020; Berg & Chyung, 2008; Ley, 2020).

This culture-situated understanding lays the groundwork for designing and developing other components of informal learning activities. Instructional design usually involves outcome-aligned content of instruction, instructors and learners, delivery of media and messages, and the community. Within the community, learners interact with instruction through proper delivery methods, communication, collaboration, reflection, and interpret the outcomes and perform applications in contexts. These are the components and processes of the Activity Theory (AT), which was initially implemented in instruction and programming for medical diagnosis (Engeström, 2001a, 2001b). In an informal learning system, AT can be used as a framework for:

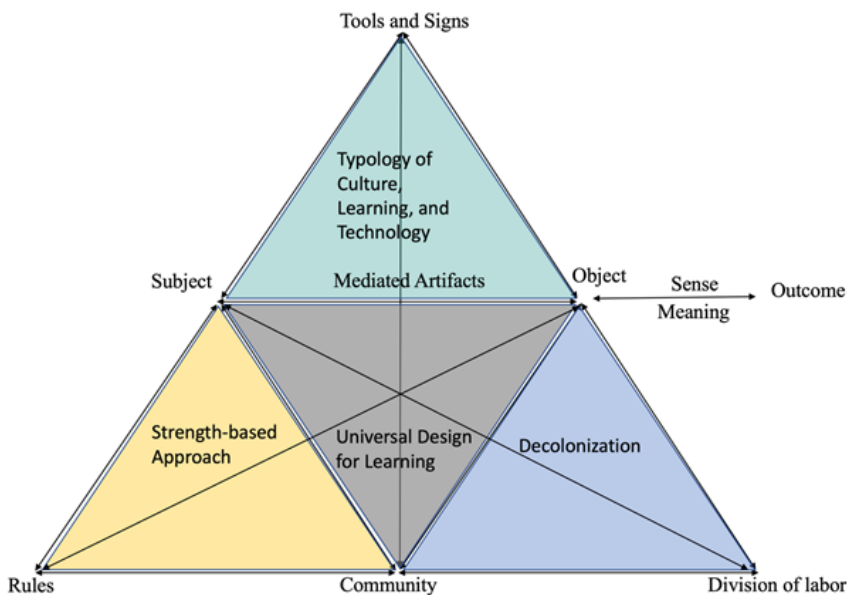
- human individual agency as content experts and learners (Subjects),
- instruction or training message development and delivery in various formats of text, images, audio, and video with or without human instructors (Media, Tools, and Mediated Artifacts),
- process and space to fulfill the outcomes (Community, Rules, and Division of Labor).
- artifacts and effects resulted from the informal learning (Objects, Outcome)

AT acknowledges that there are cultural and historical implications to the activities by subjects and how objects generated. Engeström (2001b) states the inclusiveness with the term "multivoicedness of activity", which means taking into

consideration the diverse perspectives from patients, patients’ relatives, and medical personnel involved in the program and instruction. These not only include the cultural backgrounds of the personnel, but also the organizational culture where the program takes place if it’s workplace-based or organized informal learning.

Figure 1

Inclusive Instructional Design Framework (Liu, 2018). Used with Permission.



Picture of Activity Theory Framework to Promote Inclusive Design

As shown in Figure 1, the core components of the Activity Theory (AT) play fundamental roles in learning environment design. “Building a learning environment from an activity system perspective respects the core value of human interactivity as individuals as well as a community. More importantly, an activity system contextualizes the activities in a learning environment with the means, including tools, artifacts, rules, and roles that lead to and result in object and outcome” (Liu, 2018, p. 3). According to AT, *object* and *outcome* are embodiments of not only cognitive accomplishments but also affective fulfillment with the sense of belonging, especially for diverse populations in informal learning and workforce

development (Dewsbury & Brame, 2019; Eraut, 2004). In inclusive and culturally sensitive instructional design practices, these *objects* and *outcomes* of learning are contextualized in the history and cultural background of learners and the broader life, career, and community.

Subjects in the informal learning environment include content experts and those having more or advanced knowledge and experiences in a subject area. More important in informal learning, Subjects are learners not in the traditional brick-and-mortar classrooms, instead, the non-traditional college-age students detached from dedicated campus life (Eraut, 2004; Rooij, 2012). Each of these Subjects is an individual who brings with her/him the cultural and historical background of race, gender, age, ethnicity, belief, and social-economic status. These may or may not be directly related to the to-be-learned subject content, but will affect the use of tools, signs, and artifacts for learning, and expressions in instruction, discussion, feedback, and interpretation, which are important dialogues in formal and informal learning. For example, a nursing practitioner learning a telemedicine system may not feel comfortable with the trainings through video conferencing calls because of cultural beliefs. A first-year adult English language learner may need additional explanations of jargons or terminologies in the workplace training materials. These scenarios, situated in each respective cultural setting, affect how Subjects approach informal learning (Benson, 2018; Benson et al., 2008).

Media and messages in instructional design involve Tools and Signs and Mediated Artifacts. These are closely associated with the equity aspects of educational technology, hence the online informal learning space. Garcia and Lee (2020) affirm that understanding and combating the equity issues in student achievement should be the foundation of inclusive use of educational technology. Educational technologies have their functions, mostly inherited with historical euro-central and colonial intentions incorporated through manufacture and design. The inclusive use of these technologies and media also needs to be untethered from the once-popular assumption of technology as the panacea for educational effectiveness. To fulfill the educational technology potentials inclusively, there is much to be investigated in the social and cultural realms. Critiquing and selecting media for message formation and delivery matter for inclusiveness.

In cultures of various disciplines, tools and artifacts may also be prone to or prevent students from demonstrating their learning. "Current technologies available to distance education and e-learning environments have the potential to support accessible education congruent with non-western pedagogical approaches and social justice aims to serve marginalized populations" (Kovach et al., 2008, p. 1). Greenfield (2009) has compared the visual cognitive aspects of video games

and other types of media for informal training and education. The case-based comparison has concluded, “Every medium has its strengths and weaknesses; every medium develops some cognitive skills at the expense of others” (Greenfield, 2009, p. 71). While non-traditional space and methods adapted for teaching and learning with informal space in COVID, inclusion and equity of these applications expect further exploration (Colleen, 2020; Ray, 2020).

Community for informal learning is situated in non-traditional classroom settings and close to the working and physical, intellectual, or virtual proximity of learners. Workplace, community centers, museums, and homes can be the physical space of informal learning; whereas networked and mobile devices provide virtual space. In these community settings, formulating meaningful and inclusive relationships with the understanding of cultural backgrounds is the essence (Arbour-Nicitopoulos et al., 2018; Rooij, 2012). Supporting individuals, responsively, with recognizing their strengths, interest, passions, and capabilities with the wholeness of resource provision can lay the paths to success from the Community perspective. These include understanding the flexibility of resources for informal learners, helping these learners understand potential barriers, and supporting their re-orienting with ownership to overcome the barriers (Gardner & Toope, 2011; Kahn, 2018; Raisinghani, 2019; Staron, 2011). These strength-based approaches will engage learners with the media and methods of their choices to express their learning, which usually can result in interdisciplinary and intercultural expressions and applications of outcomes (Kahn, 2018).

As an ecosystem for informal learning co-habiting with learners living’ and social interaction spaces, Community can only be effective when respecting and scaffolding learners with all abilities. Compliance of accessibility guidelines situates in culture-specific communities with implementation of Universal Design for Learning (UDL) principles (Burgstahler, 2018; Estes et al., 2020). Accessibility is also accompanied by the primary concern of access, which means to lower educational cost and barriers with reliable and accessible open educational resources (OER) (Liu & Johnson, 2020). Along with emerging technologies and discovered UDL practices, applicable strategies are continually explored, synthesized, proposed, and implemented for accessible and inclusive instructional design and development for online learning environments (Liu, 2018; Lowenthal et al., 2020).

To be able to set up these inclusive communities for informal learners, enabling new patterns of Rules and Division of Labors in the learning environment with AT is crucial. These will require instructional designs to understand the culture and context of stakeholders (Subramony, 2017). The historical colonial roots in

education invite instructional designs to take an informed, critical, and reflective process-oriented approach to inclusivity. The evolving decolonization dialogues will connect instructional design process with the “recognition of epistemological dominance tied to systemic analyses that highlight the historical, discursive, and affective dynamics that ground hegemonic and ethnocentric practices....This interruption entails transforming the way power and resources are accumulated by current beneficiaries, to make space for difference and for the redistribution of resources, opportunities, and symbolic value” (Andreotti et al., 2015, p. 26). The understanding of decolonization needs to encompass stakeholders beyond power dynamics to encourage organizational changes and inclusive talent development, and to enable effective inclusion in the implementation of instructional design in communities with the right rules and division of labor for informal learning (Borg, 2018; Staron, 2011).

## **Inclusiveness in Instructional Design and Development**

Instructional design and development apply cognitive science with technologies and tools in diverse cultural contexts. Instructional design practices can carry cultural stamps and shape culture (Benson, 2018; Bradshaw, 2018). “Approaches to instructional design not only reflect differing world views, but they consist of values, ideologies, and images that involve inclusions and exclusions that act in the interests of particular cultural, class, and gendered groups...as cultural artifacts, computers, software, and instructional design influence the dynamic work of cultural reproduction and transformation” (Henderson, 1996, p. 87). Needs are emerging in curriculum transformation to overcome cultural barriers in teaching and learning and make education culturally responsive for the ever-evolving multicultural diverse learner populations (Chen, 2007; Higbee et al., 2010; Raisinghani, 2019).

With the rising needs from workplace and non-school settings, inclusive informal learning is to be designed and developed to sustain lifelong learning for human life goal achievement and personal fulfillment (Arbour-Nicitopoulos et al., 2018; Berg & Chyung, 2008; Carliner, 2013; Jin et al., 2019; Straub, 2009). To provide an inclusive learning experience with equity and inclusion in mind and as a knowledge base, instructional design can be most effective when understanding the social and cultural contexts of these learners and adopting the appropriate awareness, conceptualization, and actions in design and development (Bradshaw, 2018; Garcia & Lee, 2020; John & Sutherland, 2005; Ley, 2020). With these integrations, instructional design practices and directions can drive inclusiveness in changes of curriculum and training, analyses of learners and their learning needs, and processes of learning fulfillment with the right cultural settings.

## **Changes of Curriculum Culture and Instructional Design Inclusiveness**

Changes in curriculum culture for formal and informal learning are evolving. This includes conducting self-reflection and self-criticism of euro-centralism, acknowledging bias and privilege, revisiting and revising curriculum that carries cultural misconceptions of Western dominant pedagogies, and ensuring voices of the marginalized and underrepresented population are heard and recentered. Twyman-Ghoshal and Lacorazza (2021) argued that “antiracist teaching is about changing a culture that maintains a system of oppression and upholds disparities in education, health care, criminal justice, politics, science, and business”. Inclusion and equity strived by these changes require “to understand which learning behaviors are based on deeply entrenched cultural values that should not be challenged and which behaviors are more superficial practices that can be challenged for the sake of promoting learning” (Parrish & Linder-VanBerschoot, 2010, p. 10). With these calls for changes, multicultural instructional design, trans-culturally responsive education, critical pedagogy, and digital critical pedagogy based on critical race theories need to be the training and reflective foundations for inclusive instructional design and development (Bradshaw, 2018; Campbell et al., 2009; Higbee et al., 2010). Actionable examples can include, systemic conceptualization for instructional design professional development with content on culturally responsive and critical pedagogies for epistemological transformation; decolonization for equity in technologies, resources, infrastructure; legislature and compliance information, and an understanding of applying strength-based approaches in real-world workplace and informal learning settings (Andreotti, Stein, Ahenakew, & Hunt, 2015; Gray & Kabadaki, 2005; McLoughlin, 1999; Morong & DesBiens, 2016; Smith & Ayers, 2006).

Curriculum changes can center or recenter marginalized groups with interdisciplinary and culture-oriented programs and redistribute instructional resources (Andreotti et al., 2015). Culturally inclusive curriculum changes can provide informal learning that relates to all learners to integrate science and humanity curricular with cultural base, that transforms career paths for marginalized and underrepresented populations, and raise awareness of and develop conceptualization for changes (Arora et al., 2020; Banks, 2001; Baynes, 2016; Borg, 2018; Metaxa-Kakavouli et al., 2018; Scheiner-Fisher, 2012; Staikidis & Morris, 2019; Yeboah, 2018). These changes may also affect identity formation for informal learners (Greenhow & Robelia, 2009). These will also require insights and expertise from multiple disciplines for inclusive curricular, courses, or training programs. Therefore, instructional design and development for these novel programs and courses will need professionals and relevant stakeholders to have a shared understanding of these cultural settings.



## **Understanding Learners’ Values, History, and Culture with Culturally Situated Research**

Analyses have been fundamental to instructional design in developing a thorough understanding of needs, learners, and instructional tasks (Branch & Kopcha, 2014; Larson & Lockee, 2019; Merrill, 2012). The history of the instructional design and development fields has unveiled, “not making explicit connections between IDT benchmarks and the broader social context is nothing short of mis-educative” (Bradshaw, 2018, p. 342). Understanding the culture and history with cultural-situated participatory research can lay a cognizance foundation and context for inclusive and accessible instructional design and development (Benson, 2018; Burgstahler, 2018; Henderson, 1996; Higbee et al., 2010).

Culturally orientated participatory research places instructional design as a disruptive analysis that transforms the views from the pre-existing colonial, racial, and socially patterned assumptions. The analyses will situate instructional design in the mindset of learners in their cultural settings. The Culture here is defined as:

“...multiple types of cultures, including cultures based on demographic characteristics such as race, gender, ethnicity, nationality, and social class, as well as organizational cultures, group cultures, learning environment cultures, etc. Further, the definitions acknowledge that individuals can belong to multiple cultures, sharing the characteristics of each culture to a certain degree.” (Benson, 2018, p. 329).

Multiple dimensions of cultural differences can affect learning (Parrish & Linder-VanBerschoot, 2010). These dimensions are reflected in the social relationship of “equality and authority, individualism and collectivism, and nurture and challenge, epistemological beliefs, stability, reasoning and causality, and in the temporal perception of time” (Parrish & Linder-VanBerschoot, 2010, p. 10). The understanding of these dimensions needs cultural-situated participatory research as instructional design analysis so that scholars and practitioners can critically and inclusively analyze the learners, their needs, learning process in the power dynamics, from social justice perspectives (Bazzul & Carter, 2017; Davis et al., 2010). Then the disruptive and equity-oriented power understanding will ensure inclusive access to equipment, facility, resources, and technology that support and enable teaching and learning (Andreotti et al., 2015).

Cultural-situated analyses, and equity in resources and material distribution are

just part of inclusiveness. Instructional design that is based on the strengths, values, interests, passions, and abilities can make informal learning a belonging journey, to begin with, continue, and conclude with the sense of engagement and success. Because of the integration of strength-based approaches in nurturing the learning interest of students with special needs, Robert with Tourette's Syndrome can become a knowledgeable librarian on research topics from anthropology to genetic engineering, with *stories and plays to explain science visually to him*. Alice with Pervasive Developmental Disorders can use *drawing and designing maps* to demonstrate her interest in astronomy and using songs to show her chemistry learning achievement (Kahn, 2018). Strength-based instructional design can situate learners with their life experience. Gray and Kabadaki (2005) have experimented to use life stories to connect older adults to set up their learning community. Using dramatic vignettes, they have also provided scaffolding to help these older adult learners express concerns or previously encountered issues in learning. Conducting participatory cultural-situated research, with these learners in their workplace or relevant learning settings over time, is fundamental to proper analyses of their needs, purposes, and process of learning, and highlight learners' strengths for their cultural-situated learning journeys.

## **Universal Design Principles as the Cornerstone for Inclusive Instructional Design**

The metaphor of opening or slamming doors can be critical in instructional design for both physical and virtual learning settings for informal learners. To implement UDL for online learners, Burgstahler (2015a, 2018) proposed guidance for making course-level and program-level accessibility, including navigation, predictability, keyboard friendliness, enough time, and alternatives of different media formats. Lowenthal, et al. (2020) compared representative guidelines of accessibility compliance for online learning environments and provided practical strategies on making text, images, audio, and video accessibility for online learners.

In the COVID-19 pandemic, online learning became pivotal for both formal and informal learning with reliance on the online environment and mobile apps, although the fundamental difference between this emergency remote and real online learning was identified (Green, 2020; Hodges et al., 2020). This historic switch to online mode, however, disclosed so much about inclusiveness for instructional design. Finding low-tech solutions and being creative in instructional design and teaching also indicated intentions to make learning accessible. Providing high contrast text with background and making shortened and explicit course content descriptions were just some basic steps to make the course accessible and inclusive. This was also enhanced by making content downloadable

to not be hindered with slower internet speeds. The experience of teaching and learning with video content taught instructors and instructional designers to make it more effective through the use of microlearning, embedding questions to engage students, and manage the content delivery with a clean and clear timeline (Moore, 2020). In addition to the close captioning of video, transcripts and live captioning for video conferencing recordings saw rising uses and attention, even though there is still much to be expected (Greta, 2020).

Since informal learning has been taking place in both physical and online settings, the conceptualization and guiding principles need to encompass accessibility of physical space for informal learning as well (Berg & Chyung, 2008; Ley, 2020). In the design of physical non-classroom settings for informal learning, Burgstahler (2015) provided principles in educational settings with a primary focus on accessibility and inclusion for learners with all abilities.

### **Inclusiveness in Informal Learning Environment Development**

Informal learning can occur anywhere. In the workplace, museums, homes, community centers, and parks, with online or mobile instructional materials. Design of these spaces with inclusion, accessibility and equity in mind is crucial for access and is novel and in need of creativity and interdisciplinary exploration. For example, physics instruction and learning are not restricted to a physics lab on a traditional school or college campus. Bülbül (2018) presents details and procedural description for converting an office space into an accessible physics lab. The design includes the JAWs text-to-speech screen reader, Braille labeling of the facility, and protection of learners from hard surfaces with soft material covers. Informal learning design like this is emerging to gradually fix the "ramp vs. stairs" scenario and enhance learners' access to informal learning in-person and online (Burgstahler, 2015a, 2015b).

Inclusive instructional design can also be expressed through lower costs for broader access such as open educational resources (OER) and low-cost laboratory kits. Liu and Johnson (2020) investigated instructional design and development of accessible low-cost OER to reach learners online in non-traditional classroom settings. Vutukuru (2020), an instructor from Boston college, has shared an inclusive lab-based learning scenario of "a lab kit containing all the essential components for the labs and shipped the students, wherever they were in the world."

For gender equity, Daniel (2013) proposes a Gender-Integrated Design framework to support designers to be able to see the proxemics, feel the ergonomics, and make sense of space through participatory research of status and identity. Metaxa-

Kakavouli et al. (2018) compared student learning and perception of two computer science courses with identical content, but with different web interface designs. For example, one course was designed with gender-neutral themes; whereas another with masculine themes. The study results indicated that female students felt less “ambient belonging” with the masculine-themed course site. The researchers provide suggestions for developing gender-neutral online interface design.

Mobile applications using inclusive design are also essential to informal learning. For example, Gray and Kabadaki (2005) conducted a study of mobile app development for older adults for pursuing personal fulfillment with informal learning. Their study results recommended mobile apps use self-paced learning, deliver chunked segments of content, and have lower need for assistance and offer features that encourage interpersonal and intergenerational collaboration and communications. Online learning environments present more flexibility in study location, time, and pace. Informal learning can take place with learner-driven connection and communication through social media/networking sites, in combination with formally or informally developed instruction or training materials. These can possibly pose challenges and opportunities for informal learning where instructional design can leverage an inclusive lens on the context and technology affordances.

### **Inclusiveness in Instructional Design Implementation**

Inclusive instructional design sets the framework for equity and belonging in learning experiences. The development of instructional content and the actual instruction will further gear the results of inclusiveness in its implementation. Inclusive design and development take place in contextualized settings with varied infrastructure and organizational culture of educational technologies. These technological and organizational cultures, with subjectively assumed affordances, have historically had colonial and biased preferences of how the media should be captured and presented (Andreotti et al., 2015; Dyer, 1999; Dyer, 2000). Thus, equity and inclusion can best be understood through the social and cultural contexts of the application and learners to make respective adjustments (Garcia & Lee, 2020; John & Sutherland, 2005).

Inclusive instructional design can be sustainably implemented with the considerations of inclusive learning space, in-person or virtual (Berman, 2020; Yeh et al., 2020). Arbour-Nicitopoulos et al.(2018) conducted a scoping review of literature on out-of-school physical activities for children with disabilities, and provided recommendations for in-person informal learning settings. Relevant to an online environment, these recommendations include, “low-technology adaptations

to provide additional support and stability” (Arbour-Nicitopoulos et al. 2018, p.127). An online self-paced training for wellness assistants and caregivers for persons with disabilities can adapt UDL principles in a minimalistic design with Amazon Polly embedded in a WordPress site to allow mobile access with screen readers for informal learning (<https://inclusivewellness.org/training>).

The implementation of inclusive instructional design in informal learning can also be provided in professional development (PD). After conducting a systematic review of literature on PD for inclusive education, Waitoller and Artiles (2013) recommend PD “on the intersections of disability with other markers of difference and educational equity.” The incorporation of a culturally inclusive PD for instructional design professionals and stakeholders increases the awareness that access is not neutral and that human relations in a technology-mediated learning environment need to be recentered. Critical technological literacy needs to be developed “for disrupting and dismantling structures that uphold inequality while inventing new tools that sustain a more equitable and humanizing world” (Garcia & Lee, 2020, p. 255).

In essence, the inclusiveness of instructional design in online environments requires a culturally oriented examination of the assumptions that a technology’s infrastructure may afford to learners of diverse backgrounds and needs. For example, video conferencing has been assumed to support and enhance connectivity for online learning. However, Roberts and McCluney (2020) indicate that the COVID-19:

“...work from home arrangements often require people to (virtually) invite coworkers, clients, physicians, students, and professors into their homes, which undermines their ability to exercise agency and control over how they present their identities. Videoconferencing has transformed formerly safe, private spaces for authentic cultural expression into focal points of the public gaze.”.

These experiences confirm how online environments can shape perceived identity positively or negatively. These also provide a profound reflective basis for implementing inclusive informal learning with the balance of work, learning, and life (Ley, 2020).

## Discussion

The informal learning infrastructure, learners' needs, settings, and space are culturally inherited and evolving. These variables affect the various components in the activity system of informal learning. With the continued access to online learning materials post-COVID19, informal learning continues to grow in the online environment, in parallel with learning and engagement occurring in the workplace, community centers, museums, and learners' living space. Post-COVID19 learning also presents a greater need for attention to diversity, equity, and inclusion in curricular and workplace. Therefore, culturally situated awareness and PD for inclusive competency appears to be pre-requisites for designers, developers, and strategists in the development of inclusive informal learning for in-person and online communities. Online informal learning, in a digital and networked world, plays a key role in connectivity and continuity while meeting the demands of equity, access, and inclusion.

To meet these demands, instructional design and development for informal learning is facing transformations in approaching culturally situated systemic re-conceptualization and change. As Bradshaw (2018) states:

“We must explore how we can individually and collectively reconcile and integrate the struggles for critical consciousness and education for freedom, with the primary purposes and responsibilities of our field. We must seek and learn other ways of engaging, such as dialectics instead of debates, cultural synthesis instead of cultural invasion” (p. 343).

Scaffolding systemic changes and approaching social equity through instructional design will raise awareness of cultural, technological, and curricular inclusiveness. Particularly as it relates to adaptation in developing activities for informal learning. Activity Theory together with UDL, strength-based approaches, and decolonization, provide a synthesized theoretical framework for inclusive instructional design and development for informal learning with online environments. Culturally situated collaborative research can prepare and position instructional designers properly with a peer supportive foundation to understand, analyze, propose, and apply course- and curricula-related transformations.

## References

- Andreotti, V. de O., Stein, S., Ahenakew, C., & Hunt, D. (2015). Mapping interpretations of decolonization in the context of higher education. *Decolonization: Indigeneity, Education & Society*, 4(1), 21-40. <https://jps.library.utoronto.ca/index.php/des/article/view/22168>
- Arbour-Nicitopoulos, K. P., Grassmann, V., Orr, K., McPherson, A. C., Faulkner, G. E., & Wright, F. V. (2018). A Scoping Review of Inclusive Out-of-School Time Physical Activity Programs for Children and Youth With Physical Disabilities. *Adapted Physical Activity Quarterly*, 35(1), 111-138. <https://doi.org/10.1123/apaq.2017-0012>
- Arora, V. M., Wray, C. M., O'Glasser, A. Y., Shapiro, M., & Jain, S. (2020). Using the curriculum vitae to promote gender equity during the COVID-19 pandemic. *Proceedings of the National Academy of Sciences*, 117(39), 24032-24032. <https://doi.org/10.1073/pnas.2012969117>
- Banks, J. A. (2016). Approaches to multicultural curriculum reform. In J. A. Banks and C. A. M. Banks (Eds) *Multicultural education: Issues and perspectives* (pp.151-170). John Wiley & Sons. 225-246.
- Baumgartner, N. (2020, April 8). Build a Culture That Aligns with People's Values. *Harvard Business Review*. <https://hbr.org/2020/04/build-a-culture-that-aligns-with-peoples-values>
- Baynes, R. (2016). Teachers' attitudes to including Indigenous knowledges in the Australian science curriculum. *The Australian Journal of Indigenous Education*, 45(1), 80-90. doi:10.1017/jie.2015.29
- Bazzul, J., & Carter, L. (2017). (Re)considering Foucault for science education research: Considerations of truth, power and governance. *Cultural Studies of Science Education*, 12(2), 435-452. <https://doi.org/10.1007/s11422-016-9800-2>
- Benson, A. (2018). A Typology for Conducting Research in Culture, Learning and Technology. *TechTrends*, 62(4), 329-335. <https://doi.org/10.1007/s11528-018-0267-8>
- Benson, A., Lawler, C., & Whitworth, A. (2008). Rules, roles and tools: Activity theory and the comparative study of e-learning. *British Journal of Educational Technology*, 39(3), 456-467. <https://doi.org/10.1111/j.1467-8535.2008.00838.x>

- Berg, S. A., & Chyung, S. Y. (2008). Factors that influence informal learning in the workplace. *Journal of Workplace Learning, 20*(4), 229-244. <https://doi.org/10.1108/13665620810871097>
- Berman, N. (2020). A critical examination of informal learning spaces. *Higher Education Research & Development, 39*(1), 127-140. <https://doi.org/10.1080/07294360.2019.1670147>
- Borg, S. A. (2018). *Ubuntugogy as Contextualized Instructional Design for Adult Leadership Development within the Swaziland Leadership Academy* (Doctoral dissertation, Fuller Theological Seminary, School of Intercultural Studies).
- Bradshaw, A. C. (2018). Reconsidering the Instructional Design and Technology Timeline Through a Lens of Social Justice. *TechTrends, 62*(4), 336-344. <https://doi.org/10.1007/s11528-018-0269-6>
- Branch, R. M., & Kopcha, T. J. (2014). Instructional Design Models. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of Research on Educational Communications and Technology* (pp. 77-87). Springer. [https://doi.org/10.1007/978-1-4614-3185-5\\_7](https://doi.org/10.1007/978-1-4614-3185-5_7)
- Bülbül, M. Ş. (2018). From Academician's Office to Physics Lab for Students with Special Needs: A Guide for Transformation. *Towards Inclusion of All Learners through Science Teacher Education, 141-150*. Brill Sense. [https://doi.org/10.1163/9789004368422\\_016](https://doi.org/10.1163/9789004368422_016)
- Burgstahler, S. (2015a). *Universal Design in Higher Education: From Principles to Practice* (2nd ed.). Harvard Education Press.
- Burgstahler, S. (2015b). Opening Doors or Slamming Them Shut? Online Learning Practices and Students with Disabilities. *Social Inclusion, 3*(6), 69-79. <https://doi.org/10.17645/si.v3i6.420>
- Burgstahler, S. (2018). Inclusive Online Science Education: What Teachers Need to Know. *Towards Inclusion of All Learners through Science Teacher Education, 115-123*. [https://doi.org/10.1163/9789004368422\\_013](https://doi.org/10.1163/9789004368422_013)
- Campbell, K., Schwier, R. A., & Kenny, R. F. (2009). The critical, relational practice of instructional design in higher education: An emerging model of change agency. *Educational Technology Research and Development, 57*(5), 645-663. <https://doi.org/10.1007/s11423-007-9061-6>
- Carliner, S. (2012). *Informal Learning Basics*. American Society for Training and



Development.

- Carliner, S. (2013). How Have Concepts of Informal Learning Developed Over Time? *Performance Improvement*, 52(3), 5-11.  
<https://doi.org/10.1002/pfi.21330>
- Chen, C.-H. (2007). Cultural diversity in instructional design for technology-based education. *British Journal of Educational Technology*, 38(6), 1113-1116.  
<https://doi.org/10.1111/j.1467-8535.2007.00738.x>
- Colleen, F. (2020). *Remotely hands-on: Teaching lab sciences and the fine arts during COVID-19*.  
<https://www.insidehighered.com/news/2020/04/14/teaching-lab-sciences-and-fine-arts-during-covid-19>
- Daniel, G. (2013). *Designing for Gender Equality in the Developing Context: Developing a Gender-Integrated Design Process to Support Designers' Seeing, Process, and Space Making* [Thesis].  
<https://digital.lib.washington.edu:443/researchworks/handle/1773/23792>
- Davis, E. B., Kee, J., & Newcomer, K. (2010). Strategic transformation process: Toward purpose, people, process and power. *Organization Management Journal*, 7(1), 66-80. <https://doi.org/10.1057/omj.2010.6>
- Dewsbury, B., & Brame, C. J. (2019). Inclusive Teaching. *CBE—Life Sciences Education*, 18(2), fe2 1-5. <https://doi.org/10.1187/cbe.19-01-0021>
- Dyer, Richard. (1999). Making 'white' people white. *The Social Shaping of Technology*, 134-140.
- Dyer, Robert. (2000). The Matter of Whiteness. In *Theories of race and racism: A reader* (pp. 539-548). Routledge. <https://doi.org/10.4324/9781003060802>
- Engeström, Y. (2001a). Making Expansive Decisions: An Activity-Theoretical Study of Practitioners Building Collaborative Medical Care for Children. In C. M. Allwood & M. Selart (Eds.), *Decision Making: Social and Creative Dimensions* (pp. 281-301). Springer Netherlands.  
[https://doi.org/10.1007/978-94-015-9827-9\\_14](https://doi.org/10.1007/978-94-015-9827-9_14)
- Engeström, Y. (2001b). Expansive Learning at Work: Toward an activity theoretical reconceptualization. *Journal of Education and Work*, 14(1), 133-156. <https://doi.org/10.1080/13639080020028747>

- Eraut, M. (2004). Informal learning in the workplace. *Studies in Continuing Education, 26*(2), 247-273. <https://doi.org/10.1080/158037042000225245>
- Estes, M. D., Beverly, C. L., & Castillo, M. (2020). Designing for Accessibility: The Intersection of Instructional Design and Disability. In M. J. Bishop, E. Boling, J. Elen, & V. Svihla (Eds.), *Handbook of Research in Educational Communications and Technology: Learning Design* (pp. 205-227). Springer International Publishing. [https://doi.org/10.1007/978-3-030-36119-8\\_8](https://doi.org/10.1007/978-3-030-36119-8_8)
- Garcia, A., & Lee, C. H. (2020). Equity-Centered Approaches to Educational Technology. In M. J. Bishop, E. Boling, J. Elen, & V. Svihla (Eds.), *Handbook of Research in Educational Communications and Technology: Learning Design* (pp. 247-261). Springer International Publishing. [https://doi.org/10.1007/978-3-030-36119-8\\_10](https://doi.org/10.1007/978-3-030-36119-8_10)
- Gardner, M. K., & Toope, D. F. (2011). A Social Justice Perspective on Strengths-Based Approaches: Exploring Educators' Perspectives and Practices. *Canadian Journal of Education, 34*(3), 86-102.
- Germain-Rutherford, A., & Kerr, B. (2008). An Inclusive Approach To Online Learning Environments: Models And Resources. *Turkish Online Journal of Distance Education, 9*(2), 64-85.
- Gray, J. I., & Kabadaki, K. (2005). A Strengths Perspective for Assessing Older Adults: Curriculum Enrichment in a Human Behavior Course. *Journal of Baccalaureate Social Work, 11*(sp1), 55-66. <https://doi.org/10.18084/1084-7219.11.sp1.55>
- Green, S. (2020, August 27). *9 Essential Apps to Help You Survive Your Online Classes - Colorado State University Online*. <https://blog.online.colostate.edu/blog/education/9-essential-apps-to-help-you-survive-your-online-classes/>
- Greenfield, P. M. (2009). Technology and Informal Education: What Is Taught, What Is Learned. *Science, 323*(5910), 69-71. <https://doi.org/10.1126/science.1167190>
- Greenhow, C., & Robelia, B. (2009). Informal learning and identity formation in online social networks. *Learning, media and technology, 34*(2), 119-140. <https://doi.org/10.1080/17439880902923580>
- Greta, A. (2020). Remote learning shift leaves students with disabilities behind.

<https://www.insidehighered.com/news/2020/04/06/remote-learning-shift-leave-s-students-disabilities-behind>

- Henderson, L. (1996). Instructional Design of Interactive Multimedia: A Cultural Critique. *Educational Technology Research and Development*, 44(4), 85-104. <https://doi.org/10.1007/BF02299823>
- Higbee, J. L., Schultz, J. L., & Goff, E. (2010). Pedagogy of inclusion: Integrated multicultural instructional design. *Journal of College Reading and Learning*, 41(1), 49-66. <https://doi.org/10.1080/10790195.2010.10850335>
- Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The Difference Between Emergency Remote Teaching and Online Learning. *EDUCAUSE Review*. <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning>
- Jin, B., Kim, J., & Baumgartner, L. M. (2019). Informal Learning of Older Adults in Using Mobile Devices: A Review of the Literature. *Adult Education Quarterly*, 69(2), 120-141. <https://doi.org/10.1177/0741713619834726>
- John, P., & Sutherland, R. (2005). Affordance, opportunity and the pedagogical implications of ICT. *Educational Review*, 57(4), 405-413. <https://doi.org/10.1080/00131910500278256>
- Kahn, S. (2018). From Access to Assets: Strength-Based Visions for Inclusive Science Education. *Towards Inclusion of All Learners through Science Teacher Education*, (pp. 105-114). Brill Sense. [https://doi.org/10.1163/9789004368422\\_012](https://doi.org/10.1163/9789004368422_012)
- Kovach, M., Bjornson, D. L., & Montgomery, H. (2008). Distance Education for Social Justice in the Wireless Era: Enabling Indigenous Students' Access to Post-secondary Education through Distance Learning. In *Access to Learning for Development session at The Fifth-Pan Commonwealth Forum on Open Learning, London, United Kingdom*.
- Lai, J., & Widmar, N. O. (2021). Revisiting the Digital Divide in the COVID-19 Era. *Applied Economic Perspectives and Policy*, 43(1), 458-464. <https://doi.org/10.1002/aapp.13104>
- Lai, K.-W., Khaddage, F., & Knezek, G. (2013). Blending student technology experiences in formal and informal learning. *Journal of Computer Assisted*

*Learning*, 29(5), 414–425. <https://doi.org/10.1111/jcal.12030>

Larson, M. B., & Lockee, B. B. (2019). *Streamlined ID: A Practical Guide to Instructional Design*. Routledge. <https://doi.org/10.4324/9781351258722>

Ley, T. (2020). Knowledge structures for integrating working and learning: A reflection on a decade of learning technology research for workplace learning. *British Journal of Educational Technology*, 51(2), 331–346. <https://doi.org/10.1111/bjet.12835>

Liu, J. C. (2018). Design of Innovative Learning Environment: An Activity System Perspective. In M. J. Spector, B. B. Lockee, & M. D. Childress (Eds.), *Learning, Design, and Technology* (pp. 1–25). Springer International Publishing. [https://doi.org/10.1007/978-3-319-17727-4\\_85-1](https://doi.org/10.1007/978-3-319-17727-4_85-1)

Liu, J. C., & Johnson, E. (2020). Instructional Development of Media-Based Science OER. *TechTrends: Linking Research and Practice to Improve Learning*, 64(3), 439–450. <https://doi.org/10.1007/s11528-020-00481-9>

Lowenthal, P. R., Humphrey, M., Conley, Q., Dunlap, J. C., Greear, K., Lowenthal, A., & Giacumo, L. A. (2020). Creating accessible and inclusive online learning: Moving beyond compliance and broadening the discussion. *Quarterly Review of Distance Education*, 21(2), 1–21.

McLoughlin, C. (1999). Culturally responsive technology use: developing an online community of learners. *British Journal of Educational Technology*, 30(3), 231–243.

<https://doi.org/10.1111/1467-8535.00112>

Merrill, M. D. (2012). *First Principles of Instruction*. John Wiley & Sons.

Metaxa-Kakavouli, D., Wang, K., Landay, J. A., & Hancock, J. (2018). Gender-Inclusive Design: Sense of Belonging and Bias in Web Interfaces. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, 1–6. <https://doi.org/10.1145/3173574.3174188>

Morong, G., & DesBiens, D. (2016). Culturally responsive online design: Learning at intercultural intersections. *Intercultural Education*, 27(5), 474–492. <https://doi.org/10.1080/14675986.2016.1240901>

Moore, C. (2020). Now Is the Time to Embrace Mobile Learning. *EDUCAUSE Review*.

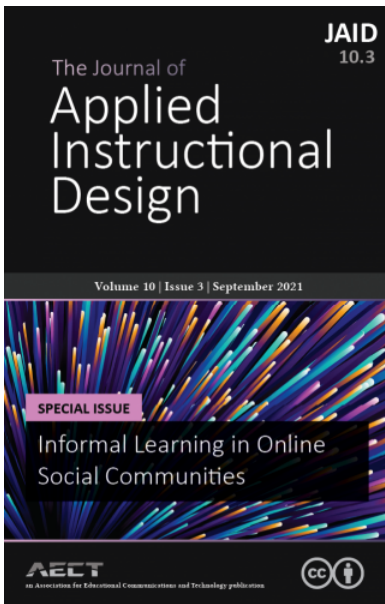
<https://er.educause.edu/blogs/2020/6/now-is-the-time-to-embrace-mobile-learning>

- Parrish, P., & Linder-VanBerschoot, J. (2010). Cultural dimensions of learning: Addressing the challenges of multicultural instruction. *The International Review of Research in Open and Distributed Learning*, 11(2), 1-19. <https://doi.org/10.19173/irrodl.v11i2.809>
- Raisinghani, L. (2019). (Trans-multi) culturally responsive education. *EdCan Network*.
- Ray, S. (2020). *Virtual Laboratories: Convergence of Learning and Career Practice | Inside Higher Ed*. <https://www.insidehighered.com/digital-learning/blogs/online-trending-now/virtual-laboratories-convergence-learning-and-career>
- Reddick, C. G., Enriquez, R., Harris, R. J., & Sharma, B. (2020). Determinants of broadband access and affordability: An analysis of a community survey on the digital divide. *Cities (London, England)*, 106, 102904. <https://doi.org/10.1016/j.cities.2020.102904>
- Robert, Y. (2021, March 23). AAPI Voices Are Taking to Social Media To Spread Awareness To #StopAAPIHate. *Forbes*. <https://www.forbes.com/sites/yolarober1/2021/03/23/aapi-voices-are-taking-to-social-media-to-spread-awareness-to-stopapihate/>
- Roberts, L. M., & McCluney, C. L. (2020, June 17). Working from Home While Black. *Harvard Business Review*. <https://hbr.org/2020/06/working-from-home-while-black>
- Rooij, S. W. van. (2012). Training older workers: Lessons learned, unlearned, and relearned from the field of instructional design. *Human Resource Management*, 51(2), 281-298. <https://doi.org/10.1002/hrm.21466>
- Scheiner-Fisher, C., & III, W. B. R. (2012). Using Historical Films to Promote Gender Equity in the History Curriculum. *The Social Studies*, 103(6), 221-225. <https://doi.org/10.1080/00377996.2011.616239>
- Smith, D. R., & Ayers, D. F. (2006). Culturally responsive pedagogy and online learning: Implications for the globalized community college. *Community College Journal of Research and Practice*, 30(5-6), 401-415. <https://edtechbooks.org-WkaU>

- Staikidis, K., & Morris, C. B. (2019). Indigenous Art Curriculum: Da-de-yo-hv-s-gv (Cherokee Word for Teaching). In *The International Encyclopedia of Art and Design Education* (pp. 1-18). American Cancer Society.  
<https://doi.org/10.1002/9781118978061.ead081>
- Staron, M. (2011). Life-based learning model—a model for strength-based approaches to capability development and implications for personal development planning. *Mindful Creations, February*, 1-14.
- Straub, E. T. (2009). Understanding Technology Adoption: Theory and Future Directions for Informal Learning. *Review of Educational Research, 79*(2), 625-649. <https://doi.org/10.3102/0034654308325896>
- Subramony, D. P. (2017). Revisiting instructional technologists' inattention to issues of cultural diversity among stakeholders. In *Culture, learning, and technology*, (1st ed., pp. 28-43). Routledge.  
<https://doi.org/10.4324/9781315681689>
- Tewathia, N., Kamath, A., & Ilavarasan, P. V. (2020). Social inequalities, fundamental inequities, and recurring of the digital divide: Insights from India. *Technology in Society, 61*, 101251, 1-11.  
<https://doi.org/10.1016/j.techsoc.2020.101251>
- Twyman-Ghoshal, A., & Lacorazza, D. C. (2021, March 31). Strategies for Antiracist and Decolonized Teaching | Faculty Focus. *Faculty Focus | Higher Ed Teaching & Learning*.  
<https://www.facultyfocus.com/articles/equality-inclusion-and-diversity/strategies-for-antiracist-and-decolonized-teaching/>
- Vutukuru, M. (2020, August 4). *Faulty Assumptions About Lab Teaching During COVID*.  
<https://www.insidehighered.com/advice/2020/08/05/engineering-instructor-disagrees-notion-lab-courses-cant-be-taught-effectively>
- Waitoller, F. R., & Artiles, A. J. (2013). A Decade of Professional Development Research for Inclusive Education: A Critical Review and Notes for a Research Program. *Review of Educational Research, 83*(3), 319-356.  
<https://doi.org/10.3102/0034654313483905>
- Wang, C. (2021, March 5). Asian Americans have often needed to “prove” racism. Then social media video came along. *NBC News*.  
<https://www.nbcnews.com/news/asian-america/asian-americans-have-often-ne>

eded-prove-racism-then-social-media-n1258896

- Watts, G. (2020). COVID-19 and the digital divide in the UK. *The Lancet Digital Health*, 2(8), e395–e396. [https://doi.org/10.1016/S2589-7500\(20\)30169-2](https://doi.org/10.1016/S2589-7500(20)30169-2)
- Yeboah, R. M. (2018). From the Civil Rights Movement to Black Lives Matter: The African Union and the African-Americans in the United States. *Journal of Pan African Studies*, 12(1), 166-189.
- Yeh, C., Trisha Sugita, & Tan, P. (2020). Reimagining Inclusive Spaces for Mathematics Learning. *Mathematics Teacher: Learning and Teaching PK-12*, 113(9), 708-714. <https://doi.org/10.5951/MTLT.2019.0101>



Liu, J. C. (2021). Inclusiveness in Instructional Design & Development of Informal Learning Experiences: From Cultural Lenses. *The Journal of Applied Instructional Design*, 10(3).  
<https://dx.doi.org/10.51869/103/jcl>