

Forming and Sustaining a Learning Community and Developing Implicit Collective Goals in an Open Future Learning Space

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This study investigates the role of space, material, and affect in undergraduate and graduate students' lived experiences within an open Future Learning Space. Future Learning Spaces (FLSs) blend the latest in architectural advances for space design (e.g., modern, flexible furniture within collaborative environments that provide bring-your-own-device [BYOD] connectivity) and advances in perspectives on learning and instruction (e.g., situated learning, distributed cognition, learning communities, knowledge building, collective inquiry; Hod, 2017). Findings suggest that the FLS was able to: (1) bring together individuals by producing individual and shared affective responses; (2) hold community together and inform perceptions; as well as (3) move the community together and shape practices. This study indicates that open FLSs are complex systems constructed by users, and users of open FLSs can meet some of the criteria for a learning community (LC), especially if we broaden the definitions to take into account implicit versions of an LC.

Introduction

Future Learning Spaces (FLSs) are touted for their capacity to promote collaborative learning experiences through more open, flexible, and diverse designs combining physical and digital infrastructure (Hod, 2017). FLSs are defined as having two categories (content-flexible and content-specific) and four types (open instructional space, open learning space, space as a stage, and space as content). Each type corresponds with particular design principles which have the potential to support the development of learning communities. For example, Altimare and Sheridan (2016) found that the proximity of diverse and flexible environments within an FLS contributed to social

connectedness, which in turn helped to foster and sustain a learning community (LC).

While the design of FLSs often include principles that align with literature on learning communities (Brown & Campione, 1994; Bielaczyc & Collins, 1999), LC frameworks fall short when conceptualizing LCs within open FLSs. Traditional LC contexts are designed primarily by a teacher or designer (Brown & Campione, 1994). A teacher typically sets learning goals that all students in the class are working toward and applies design principles with the hope that an LC will develop. Attempts to develop LCs are geared toward a specific group of students and have a priori and fixed boundaries of membership. However, in an open FLS, the notion of an LC is more porous and dynamic because the users of an open FLS are not as closely bounded as students in a class.

The more porous boundaries of membership and activity in an open FLS enable users to engage not only in self-directed learning activities but also to enact and contribute to shared practices that make up the learning environment, such as policies and procedures for how the FLS should be governed, the establishment of norms, etc. Studies on the relationship between open FLSs and a sense of belonging to a community reveal that FLS users benefit from the affective atmosphere of the space even if they do not interact with

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others within the space (Carvalho, Freeman, Kearney, Mentis, & Martinez-Maldonado, 2018). Learning community in such an FLS avoids being confined to static, pre-defined parameters and instead, is better conceptualized as a malleable, fluctuating, and dynamic landscape that evolves and changes over time as constituencies of learners align with their respective learning-oriented needs within the FLS. For instance, Zeivots and Schuck's (2018) exploration of graduate level students in an open FLS demonstrated that users engaged with the space in different ways over time. While international students considered the space as a connection point with other students, domestic students considered the space as a bridge to get connected within the community by attending workshops, engaging with teaching practices, and meeting with advisors.

The current study is a case study (Stake, 1995) of a content-flexible open learning space. The goals include adding to Hod's (2017) conceptualization and providing rich descriptions of users' experiences so that findings could be transferred (and, in turn, generalized) to other open FLSs. The case involves the main studio space within the Krause Studios for Innovation in the College of Education at Pennsylvania State University (see Figure 1 and Figure 2). The main studio space is an open FLS based on theories of situated learning (Lave & Wenger, 1991) and sociocultural learning (Vygotsky, 1978); it is designed to include lightweight and diverse configurations to support collaborative activities (Rook, Choi, & McDonald, 2015). The Krause Studios for Innovation was originally named the Krause Innovation Studio (Rook et al., 2015). As the Krause Innovation Studio expanded its physical space and in recognition of its expanded role in the College of Education overall, it was renamed the Krause Studios for Innovation to represent this diversity of space and mission.

Theoretical Foundation

In this investigation, we acknowledge a need for research with broad theoretical lenses to understand the human, material, and affective relationships within open FLSs and to answer the call for research in Hod, Bielaczyc, and Ben-Zvi (2018).

Developing a Learning Community

An LC involves a group where each and every individual is "an expert responsible for sharing his or her expertise with others" (Brown & Campione, 1994, p. 260) and all are expected to be "designers... of their own learning" (p. 270). The following first principles of learning enable an LC to be developed and sustained:

- expertise is distributed across and among members of the community;

- learning involves strategies and metacognition;
- there exist multiple zones of proximal development (Vygotsky, 1978);
- there is a shared discourse and negotiation of meaning among members;
- differences are embraced and legitimized;
- there are multiple entry points and pathways to participation;
- members have overlapping roles and shared values;
- and the community is contextualized and situated within which the practice resides (Brown & Campione, 1994).

Bielaczyc and Collins (1999) provide additional LC principles based on the similarities of Brown and Campione's first principles and those in Scardamalia and Bereiter's (1994) knowledge-building classroom and Lampert's (1998) mathematics classroom. LCs share the following:

- community growth is central to an LC;
- LCs have emergent and collective goals;
- goals are articulated;
- metacognitive knowledge is shared;
- there is an appreciation for diverse opinions;
- LC members exhibit respect for others;
- there is an acceptance of failure as growth;
- individual contributions build on other LC members' contributions;
- topics are sufficiently in depth;
- expertise is distributed;
- there are multiple pathways to participation;
- ideas and products are constructed through negotiation;
- and LC products are valued and shared internally and externally.

Considering these LC principles are rooted in the notion of the classroom, it is not clear if or how these LC principles apply to the development of community within an open FLS. This study begins to fill this gap by considering how two of the LC principles are applied in an open FLS: (1) LCs have emergent and collective goals, and (2) LC members exhibit respect for others.

Space as Entanglement

From an anthropological perspective, space can be regarded as an entanglement of interactions or complex intertwining between humans and materials (Ingold, 2008) as well as among "energies (electricity, gas), resources (federal money...), information flows", etc. (Leander, Phillips, & Taylor, 2010, p. 332). The alignment between entanglements and FLSs becomes clear when considering the design and purpose of a FLS. FLSs blend the latest in architectural advances for space design (e.g., modern,



Figure 1. The Krause Studios for Innovation.

flexible furniture within collaborative environments that provide bring-your-own-device [BYOD] connectivity) and advances in perspectives on learning and instruction (e.g., situated learning, distributed cognition, learning communities, knowledge building, collective inquiry; Hod, 2017). FLSs promote learning as a social process (Punie, 2007). Like other social spaces and spaces of learning, FLSs are entanglements of materials, resources, and human beings with their own past experiences and pedagogical approaches.

The entanglements may serve multiple purposes (Fenwick, Edwards, & Sawchuk, 2011; Carvalho & Yeoman, 2018). For example, a group space could be organized with a whiteboard on a table during the collective work of the human members. At other times, in the same space whiteboards could be used to construct a physical boundary between two groups in order to provide isolation. Reconceptualization of materials and space as fluid rather than static objects helps us to consider how materials and practices within an FLS are constructed and re-made by users over time.

In an open FLS with a malleable, fluctuating, and dynamic landscape, the space involves the mobility of students within and outside the confines of physical and digital spaces. Materials are not merely inert passive objects; they play active roles in determining the way things in education (e.g., learning activities, knowledge artifacts, etc.) are assembled (Fenwick, Doyle, Michael, & Scoles, 2015). For example, an

open FLS may feature a broad variety of screens, tables, whiteboards, markers, etc. that are coupled with human actors who apply them for various purposes and in various configurations. As Fenwick et al. (2015) note, a sociomaterial view "... helps us to recognize how materials act, together with other types of things and forces, to exclude, invite and regulate activity" (p. 123-124).

Fluid boundaries emerge in two ways. First, in an open learning space the users, rather than a teacher, determine the arrangement and boundaries of their spatial layout. Users self-organize around an activity or practice of interest. Second, the porosity of the boundaries pertains to the materiality of their practices (e.g., norms, artifacts) and the mobile, ubiquitous nature of their experiences facilitated or enabled by technologies (Leander et al., 2010). What norms do they determine as a collaborative group? What tools do they use and who uses them? What artifacts do they create? An open learning space accommodates a multiplicity of discursive practices that emerge in different forms and intensities across the various collaborative groupings that form and disband over time.

The flexible, diverse environments as well as the mobility of users inherent in open FLSs prove to be challenging for researchers when considering the development of LCs. Conceptualizing space as entanglements and thinking of users within open FLSs as actors in the development or construction of norms, policies, and practices are current

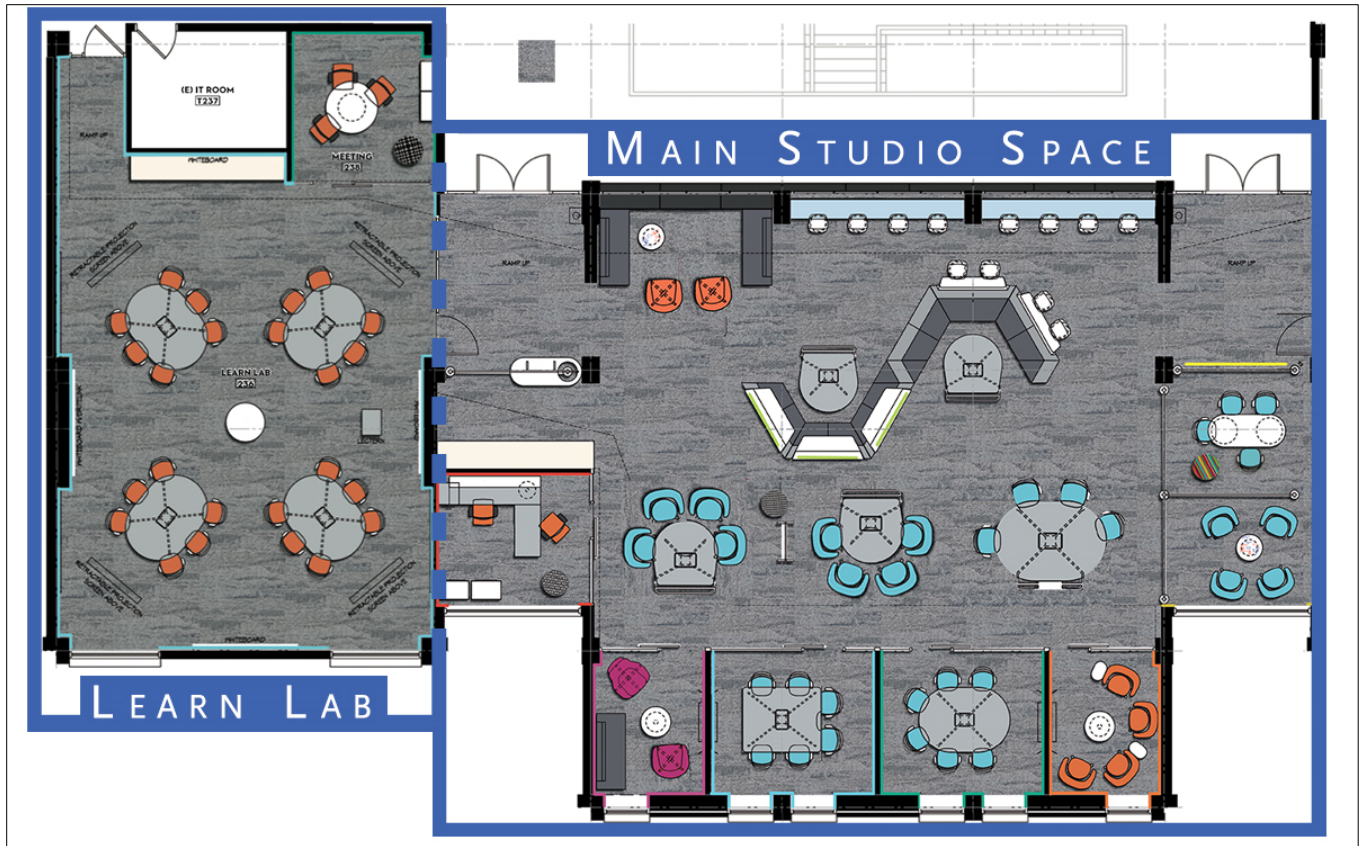


Figure 2. The Floor plan of the Krause Studios for Innovation.

gaps in the literature. We begin to address this gap by providing a direction through which to study the development of norms and the role of space within an open FLS.

Affect, Space Making, and Sense of Belonging

Affective responses or feelings generated through interactions within an FLS impact individuals' construction of materials and space (Duff, 2010). Affect, as defined by Anderson (2016), is a "...a body's capacity to affect and to be affected, where a body can in principle be anything" (p. 9). Affect can involve feelings, emotions, and bodily responses to an environment.

There are three ways that affect can contribute to the development of an LC in a FLS. First, users' entangled interactions with materials and other people within a space impact the conceptualization and attachment to the place. For example, Kellock and Sexton (2018) found that a child exhibited positive affective feelings with a school playground because she met a best friend there. Second, people may have developed a sense of community which enabled them to attach a specific meaning to a place. A place that initially caused people to have negative feelings can be re-conceptualized through interactions and affective

feelings. For example, people's joyful feelings, play activities and proximity to each other could create positive feelings within a space that initially caused negative associations (Mills, Comber, & Kelly, 2013). Third, entanglements between humans, space, and materials help to sustain a community over a period of time (Ehret & Hollett, 2016).

Ehret and Hollett (2016) investigated the role of affective feelings on forming and sustaining learning groups; they found that affective feelings are important for an individual's sense of belonging. They frame their findings in relation to both affect and place:

"Feeling the affects of place *coming together* in emergent activity and feeling the affects of place *holding together* toward a sense of belonging are therefore essential to knowing how the actions and practices that emerge from these feelings mark place as thick for learning and doing. Indeed, the affective life of place coming together and holding together enables an affective *moving together* with shared purpose that marks place as ripe with action-potential" (p. 253).

To illustrate coming, holding and moving, Ehret and Hollett present examples from a place within a Minecraft game. Students came together to consider "being in something with others" (p. 254). In holding together, Ehret

and Hollett noticed the tensions that arose within the environment, and how the place provided an environment to help individuals move past tensions and generate positive feelings. Finally, in moving together students' senses of belonging were maintained and supported. Students moved "toward a stronger social sense, a feeling, of learning, making, and doing together in place" (p. 256).

Even though affect is a part of everyday experience it is not well articulated in the learning community literature (although as Hod et al. (2018) point out, the learning sciences open up new opportunities for research in this area). Ehret and Hollett demonstrated that feelings generated through interactions help learners develop a sense of belonging to a community. Interactions and feelings helped members remain in the community even when they had elevated stress or moments of tension during interactions. The framework of coming, holding, and moving together is a useful lens to frame the current study because it provides an opportunity to consider both affect and place in the development of learning community. To explore the notion of learning community within an open FLS, the following research questions are investigated:

- (1) *What is the role of space, material, and affect in users' lived experiences within an open FLS?*
- (2) *Do the users within an open FLS exhibit aspects of an LC?*
- (3) *How do the spaces, materials, and affective responses of users contribute to the development of an LC in an open FLS?*

Methods

Phenomenological interviewing (Seidman, 2012) and thematic analysis (Moustakas, 1994) were used to address the research questions. Broadly conceived, phenomenology looks at how individuals make sense of an experience, which the researcher seeks to understand by eliciting detailed descriptions of those sensemaking processes.

Conceptual approaches to space have too often been constrained by a binary or dualistic lens where they were limited to the (1) observable practices ("spatial practice") and (2) the architect's representation of space (Lefebvre, 1991, p. 38). Lefebvre (1991) urged moving away from viewing space as a static, bounded entity to one that is dynamic; he advocated widening the view to include a third perspective: the lived experiences of those who inhabit the space (p. 39). Canter (1977) argued that (1) researchers should consider how an individual's actions within a given space are guided by their interpretation of it, and (2) an individual's interpretation of their actions should be elicited through direct conversations rather than by observing behavior.

As a phenomenological study, the goal was not to generate results of direct conversations or determine findings that were generalizable, but to make what Stake

(1995) refers to as "petite generalizations" (p. 7). Our goal is to generalize to other content-flexible, open learning spaces. Thus, we emphasize the importance of a case study utilizing phenomenological and interpretive inquiry to provide an in-depth investigation of users' experiences and interpretations of how community develops.

Data Collection

Data collection involved short screening interviews with more than thirty randomly selected users of the open FLS. Each user was asked the following five questions: *What is your major and student status/year? How did you discover the Krause Studios for Innovation? How often do you use main studio? How do you use the main studio space? Why do you come here/use the main studio space?* These screening interviews helped to focus on whom to invite for in-depth interviews. Thirteen participants who frequently used the open FLS and could offer rich descriptions of how they thought about spaces, materials, and feelings were selected. Semi-structured in-depth interviews (average of fifty-five minutes) were conducted and transcribed. The semi-structured interview questions followed Seidman's (2012) recommendation to focus on historical aspects of an experience, details of experience, and reflection on experience. For example, participants were asked:

Historical aspects

- *What were your prior reasons for choosing learning spaces?*

Details of experience

- *Think about a recent day of using the main studio space (open FLS) within the Krause Studios for Innovation. Describe your movement, interactions, and activities from the second you would walk in the door to when you left.*

Reflection on the experience

- *What changes if any, do you see in the way you use spaces or think about spaces since you first started coming here?*

Participants

Participants were linked to their transcripts in the results using a participant code. The first letter (F or M) denotes the gender, the second letter (U or G) corresponds with student status, the third letter (O or I) involves the status of the individual in relation to membership within the College of Education, and the final number enables a unique identifier.

Data Analysis

Transcripts were analyzed through open thought-by-thought coding to understand participants' perspectives and voices; thematic analysis was used to determine the essential themes of participants' experiences (Moustakas, 1994). The coding process involved open coding with the goal of staying close to participants' descriptions.

Table 1. Participant Codes.

Participant Code	Gender	Student Status	Degree Program	College of Education Status
FUO1	Female	Undergrad	Engineering	Outside
FUO2	Female	Undergrad	Communications	Outside
MUO1	Male	Undergrad	Communications	Outside
FUI1	Female	Undergrad	Secondary Ed. / English	Inside*
FUI2	Female	Undergrad	Elementary Education	Inside
FUI3	Female	Undergrad	Secondary Ed. / Mathematics	Inside
MGI1	Male	Graduate / Instructor	Learning, Design, and Technology	Inside
FGI1	Female	Graduate	Science Ed.	Inside
FGI2	Female	Graduate / Instructor	Curriculum and Instruction	Inside
FGI3	Female	Graduate / Instructor	Curriculum and Instruction	Inside**
FGI4	Female	Graduate / Instructor	Language, Culture, and Society	Inside**
FGI5	Female	Graduate / Instructor	Curriculum and Instruction	Inside**
FGI6	Female	Past Graduate / Instructor	Language, Culture, and Society	Inside**
* This undergraduate student also was a staff member within the Krause Studios for Innovation.				
** These instructors had all taught at least one course using the Krause Studios for Innovation (see Figure 2) within the Krause Studios for Innovation.				

Open thought-by-thought coding produced 661 initial codes with each participant having between 42 and 62 codes. An example of moving from descriptions of experiences to open thought-by-thought codes is provided in Table 2. After initial coding, the researcher followed a constant comparative method (Glaser & Strauss, 1967) whereby each code was compared against others to uncover the unique aspects of experience. Moustakas (1994) refers to these unique codes as horizontalizations, and this process reduced the 661 initial codes to 600 unique meaning units. At this point, a level of abstraction based on theoretical codes in the literature was applied to the horizontalizations. Each code was compared against Ehret and Hollett's (2016) framework for place-making and affect regarding how space plays a role in coming, holding, and moving community together. The 600 horizontalizations or unique meaning units were combined and grouped in relation to how participants described their experiences with the open FLS. We uncovered three themes related to how the open FLS brought them together, held them together in the midst of tensions around policies, and moved them together to shared norms and practices, which we further explain in the results.

While Ehret and Hollett's study was helpful with developing our coding scheme, it differed by its methodological approach in that while theirs was primarily ethnomethodological ours was phenomenological. Ehret and Hollett's study focused on students actively engaged within an online video game environment in which the students actively constructed community and a shared community place through discourse and interaction. In our study, participants described working in proximity with

others in the open FLS and emphasized observing others' practices and modeling their own practices based on observations of others. By using phenomenological methods, we were able to focus on participants' lived experiences of using the open FLS in their own words. We did not rely on observations because discourse was not central to the community within the open FLS. We acknowledge these differences to point out that although the open FLS had a role in coming, holding, and moving together (as evidenced in the results), the interactions were different and we highlight these in the discussion.

Trustworthiness of Findings

To ensure internal validity within the coding process, one member of the research team coded all thirteen in-depth interviews and provided in vivo open codes, horizontalizations using constant comparative methods, and abstractions tied to theoretical codes in the literature. The entire coding process was cross-checked by two other members of the research team with the goal of providing peer debriefs (Lincoln & Guba, 1985). The process uncovered an issue within the initial coding schema whereby individual and shared/collective experiences were often confused. The issue was corrected and the peer debriefs provided confirmation of the themes and interpretation of data.

The trustworthiness of the findings was externally validated through the use of external observations of the research site conducted by individuals outside the research team and documented in eight self-observations. Self-observations confirmed the appropriateness of the interpretations and provided validation that such findings were evident in the open FLS.

Table 2. An Example of Thematic Coding.

Participant Code	Description of Experience	Thought-by-thought code	Horizontalizations	Themes
MUO1	<p>37:07 Can you tell me what you liked about the room, or what you didn't like about it?</p> <p>37:20 ...generally I like everything about the rooms. I like that they're clean. I love that they're colorful. I think that that really keeps me awake and excited to be working there is what I really appreciate.</p>	Color keeps participant awake and excited to be working	Colors promote positive affective responses	Bringing Community Together & Affective Responses
MGI1	<p>48:17 Do you feel similarly when you are working in the Krause Studios for Innovation or in the library or other spaces on campus?</p> <p>48:27 ...I think that what happens here is unique in the sense that the colors, the arrangement, and the seats are comfortable. I think that that kinda is unique in and of itself ummm but the library has some other features that are different that are cool too. I think for me the colors here are kinda what make me really happy (chuckling)</p>	Colors make participant happy, unique than other spaces	Colors promote positive affective responses	Bringing Community Together & Affective Responses
FUI2	<p>32:30 You don't like hang out here? Like in the main studio space within Krause Studios for Innovation?</p> <p>32:33 I hang out here or like if I see people I know cause of the glass doors. If I pass someone I know I will come in or if some people are working that I know, that will draw me in too.</p>	Will come in if participant see's someone she knows in Krause Studios for Innovation	Brings together individuals who observe familiar people	Bringing Community Together & Affective Responses

Results

Bringing Together Individuals in an Open FLS by Producing Individual and Shared Affective Responses

The open content-flexible FLS drew participants to the space because of its aesthetics (e.g. colors, clean architectural features), natural light, collaborative group environments, proximity to other spaces, and of feelings evoked through observing or interacting with others. Participants described

an appreciation for having people around them working productively and feeling energized to complete work. For example, FUI1 describes feelings evoked from seeing others in the space: *“Honestly when there are more people in here I feel like I work better. I guess it is kind of like when you see other people are doing work, you’re like oh I actually have to do work. I should get to work too. I was kind of watching all these other people doing work, you know, OK, I am really gonna (sic)... work hard.”* Participants appreciated seeing others in the space being productive enabled by the transparent glass walls and open

furniture, and as a result, would feel encouraged and motivated to complete work (or come into the FLS).

Even though sometimes the space became crowded and might be unavailable, participants came back to use the environments because of the atmosphere, vibe, and for having productive people around them. These characteristics - atmosphere, vibe, and social connectedness - evoked affective responses and contributed to participants feeling motivated to come into the space, use the space, and learn from observing others within the space.

Holding Together and Informing Perceptions

Once in the open FLS, participants described being in tension with, and then, developing an understanding of (and embracing) policies. One policy that was mentioned by all participants was the food and drink policy. Participants wanted to have something to eat or drink, but this was not allowed. Participants grew to understand that it was their role to follow this policy in order to keep the space clean. Participants described their expectations that the spaces would be cleaned by staff and ready for use the next time they used the FLS. By agreeing to uphold the food and drink policy and informing group members and others they were working with about it, participants actively embraced and enforced the policy.

Another tension focused on individual versus group goals. The diversity of spaces within the open FLS meant that there were spaces designed for both types of work. However, policies at the group spaces dictated that users needed 2-3 people to reserve the space (and reservations could be made for up to 3 hours). Multiple participants described sitting at the group spaces daily to complete individual tasks. One participant even discussed how she creatively bends the policy to meet her own needs.

[Interviewer] So, when you come to the (FLS) by yourself, do you usually stay in the individual bar area. Have you ever used another environment, as well?...

[FGI6] Sometimes I'll go over, and there will be a kid who's working at one of the tables by themselves, and so I've been known to go over and say, you know, "you can get moved, so why don't you, why don't we be a group, and I'll share." I'll go over, and the kid doesn't know how to reserve (the space), you know, so I'll reserve the space. So yes, I've been guilty of colluding or whatever that's called I don't know, collusion.

This excerpt demonstrates that even if participants understood the policies for group spaces, sometimes they would work together to meet their own individual goals as well. The diversity of spaces and the policies helped participants to use the spaces. In other words, the open FLS

played a role in holding the participants together to complete work, and the policies informed perceptions on how to use the spaces.

Similar to the "colluding" use of group spaces for individual work, participants also developed an understanding of how the spaces within the FLS served multiple purposes.

[Interviewer] What do you think about the Pink Room and the Orange Room and the Yellow Room?

[MGI1] These spaces are very similar. They're just a bit more open and fluid where the individuals are maybe even more distinct and separate. This is a collective here, for me. I don't know, this is how I make it in my head, but this is a more "we're a group, we're in here together, we're in here socializing." We're a group, however, we're individuals that are contributing to this concept or idea, but the other option of this is that these can be people that are isolated that don't have anything to do with each other... you can have two individuals working on completely different projects; they have no connection with each other. So, that's nice here to have that and then, the difference between the two is a distinct group of people that are exclusively together.

MGI1 describes the Pink Room (the bottom left room in Figure 2), the Orange Room (the bottom right room), and the Yellow Space (right side) as environments that can serve multiple purposes. For example, a group could be working collaboratively, a group of individuals could be working independently, or individuals can be working separately. MGI1's notion of a "distinct group of people that are exclusively together" suggests that even in the case of individuals (or strangers) working separately within a space, there exists an understanding that the space enables a sense of being together.

Moving Together and Shaping Practices

The open FLS was not a static container but changed and was shaped by the participants who used it. For example, the FLS was designed as a collaborative space enabling practices without noise restrictions. However, participants created an unofficial noise policy and applied the policy without any input from support staff. FGI1 mentioned a need to "constrain yourself to be more quiet" and FUI1 similarly stated that "even though this space encourages talking, I would just want to be respectful of everyone that's trying to work on their own." The norms related to noise were developed by the users of the space.

Over time participants would go from observing others using the tools and features to becoming proficient regular users of the features themselves. Similarly, participants

discussed modifying practices from simply coming to the FLS to having intentionality, or intended uses for the spaces. Moving together and shaping practices included the acknowledgement that the FLS enabled collaborative activities such as knowledge sharing and creation. The FLS also provided opportunities for collaborative support. For example, transparent glass walls enabled participants to walk by rooms within the FLS and observe activity occurring in the space. If participants were able to see familiar faces or observe someone they knew working, they would have a desire to share practices. The open FLS also included a welcome area with access to FLS staff who could assist by providing information about how to use the FLS environments. Participants mentioned working with the staff to move past frustrations or to help them with their use of the spaces. Combined with affect, the material features and support staff brought participants into interaction with others. These interactions could be considered entanglements (Ingold, 2008), and this finding suggests that the entanglements of materials, feelings and others helped to foster an LC.

Finally, the sense of belonging within the FLS might also be considered in relation to a sense of ownership of the space. Participants described the FLS using possessive words giving the impression that the space belonged to them. Construction of policies and practices, developing understanding and a sense of belonging, as well as shaping practices suggest that the users of the open FLS moved together through shared experiences and entanglements of interactions.

Discussion

This study investigated the individual experiences of users within an open FLS to understand (1) the role of space, material, and affect in users' lived experiences, (2) the extent to which the users within an open FLS exhibited aspects of an LC, and (3) how the spaces, materials, and affective responses of users contributed to the development of an LC in an open FLS. In this section, we unpack the results as they relate to each research question.

Research Question 1: What is the Role of Space, Material, and Affect in Users' Lived Experiences within an Open FLS?

Users' lived experiences are impacted by the entanglements of the open FLS features (color, light, etc.), as well as affective and social responses to the space. For instance, users felt that the FLS had an academic vibe; they felt creative and productive in the space. Their experiences were impacted over time as there was a sense of belonging to the open FLS (Ehret & Hollett, 2016), or a sense of being

together in a group environment – a “distinct group of people that are exclusively together” (MGI1). Users continued returning to the open FLS and contributing to policies even if at first they experienced tensions pertaining to those policies. Users helped to develop some of the shared policies (e.g., noise level) and implicit collective goals (e.g., productive work). The open FLS was able to hold the users together through encouraging repeat uses, and perceptions of the space were changed because of observations, entanglements, and interactions (which is consistent with Leander et al., 2010).

Research Question 2: Do the Users Within an Open FLS Exhibit Aspects of an LC and Do They Form an LC (If So, Based on What Criteria)?

There were several findings in this study that support our conceptualization of users as an emerging LC. The participants in this study followed different pathways to becoming part of an LC in the open FLS. For example, participants described using the space at different times and for different purposes, such as group projects or individual work. Participants used the open FLS as both a transitional space, while waiting for a class to start, and as a destination for specific activity. The space impacted how users negotiated their role within the emerging LC. A diversity of spaces in Krause Studios for Innovation enabled users to select the environments most conducive to their needs and patterns of practice at any particular time. FGI6 described using a group space to conduct individual work. The participant's individual goals were aligned with the collective goals and policies of the open FLS when she (as she describes) “colluded” with another student to reserve a group space for individual work. These kinds of bonds that occurred through entanglements in the space point to the emergence of an LC.

Furniture within the FLS promoted shared discourse, for example, by providing good sight lines (Hall, 1966) or providing opportunities to support discourse around visual aids (Rook et al., 2015). Participants described seeing others in the space (through the transparent glass walls) leading to interactions or working with the support staff to develop new practices. The entanglements promoted by the space were similar to more traditional patterns of practice in LCs from more formal contexts (Carvalho & Yeoman, 2018).

Users of the open FLS shaped the space in ways that were designed to meet their needs (Ehret & Hollett, 2016; Fenwick et al., 2011). The LC that emerged was lighter weight, more ephemeral, more locally goal driven, and more distributed over the various constituencies. This shaping was not only enacted in the social observations (Bandura & Walters, 1977) that took place among learners, but also through their

interactions with the material elements in the space (Carvalho & Yeoman, 2018).

These findings confirm that once a user frequents an open FLS, they move toward a trajectory of membership in an emerging LC that develops with subtle constructions of shared norms and practices around how the community uses the features within the open FLS. In other words, participants began to implicitly understand and appreciate policies and practices within the open FLS, moved toward helping to construct new policies and practices within the open FLS (e.g., productive work, low noise levels), and the FLS features shaped the practices of the emerging LC.

Two LC criteria were at play within the current study of an open FLS: (1) LCs have emergent and collective goals; and (2) LC members exhibit respect for others. In the first theme, participants implicitly created a collective goal that of, the open FLS is a space for productive work. Rather than explicit collaboratively constructed learning goals (Bielaczyc & Collins, 1999), the participants shared a perspective that on its own could be considered an implicit goal that was shared by participants.

Bielaczyc and Collins (1999) describe the respect-for-others principle as students learning to “respect other students’ contributions and differences” (p. 287). In the third theme, participants described being “respectful of everyone... trying to work” (FGI1), and this respect developed into a shared norm for noise restrictions for open areas of the open FLS.

Research Question 3: How do the Spaces, Materials, and Affective Responses of Users Contribute to the Development of an LC in an Open FLS?

The impact of the open FLS, its material features and participants’ affective feelings, began at the individual level. Participants referred to their personal preferences to return to the open FLS. Over time those individual preferences enabled them to organically contribute to an emerging LC by working toward a shared goal of accomplishing productive work, even if this goal was implicit. Through observations and interactions in the open FLS and with the staff in the space, participants became aware of the policies and helped shape the policies by developing unofficial rules to respect other users and share the community’s norms and practices.

The findings from this study suggest that users’ experiences in an open FLS follow Ehret and Hollett’s (2016) notion of building, holding, and moving as a group. Users first developed a sense of what the FLS was, developed an understanding of an individual’s and/or group’s need for using the FLS and adopting its policies and practices, and then, navigated the policies to suit their needs. In addition to policies, participants described the space as a quiet space when in fact it was designed to be a noisy space. These

patterns of practice represent the development of shared practices whereby users aligned their practices according to their individual and collective goals and purposes.

Limitations

A few limitations are noted. The open FLS used in this study was situated within a College of Education at a large university. This is problematic for two reasons. First, the people who frequent the FLS most often follow the gender patterns of the College of Education and are primarily female (see Table 1). Thus, it was not possible to determine if the results were gendered in the study and we suggest future research could speak to this concern. Second, it is not clear if or the extent to which the findings within this case study might transfer to an open FLS not situated within a College of Education, or even, at a smaller university. Future research could explore these nuances to see if cultural and contextual differences exist.

Conclusion and Implications

This paper set out to investigate the collective experiences of people within an open FLS and to understand how they act as constructors of community practices, norms, and policies. Our analysis suggested three thematic groupings: (1) bringing together individuals in an open FLS by producing individual and shared affective responses; (2) holding community together and informing perceptions; and (3) moving together and shaping practices. One notable pattern that emerged across these three groupings was the role of affect or feelings. Affect played a strong role in participants’ response to and perceptions about the space. Participants referred to details such as color, sound and light as shaping how they felt about the space. More than just being individual or personal feelings, affective responses crossed into impacting and shaping norms and practices.

More broadly, what we found was that open Future Learning Spaces, like the Krause Studios for Innovation, are complex systems constructed by users, and users of open FLSs can meet some of the criteria for an LC, especially if we broaden the definitions to take into account implicit versions of an LC. One thing that has been recognized about the complexity of studying more open FLS spaces is that they are not goal-driven in the same way that more formal learning spaces are. In classrooms, there is someone who has set out learning goals that all students in the class are working toward, and thus it makes supporting that work much more straightforward. In an open FLS the learning goals are more ephemeral and at a more abstract level of norms and practices. As we saw in our results, it tends to be more about the vibe of a space and how users feel it should be used to achieve their small, group-specific goals. The idea that participants viewed the space as productive and that

this was culturally reinforced by participants' perceptions of each other, is a shared norm, a norm that was not explicitly designed into the space. This results in a more diffuse and diaphanous set of norms and practices, but nonetheless they are present and contribute to the essence of the experience for users. While we did not find evidence for all the criteria of an LC in our open FLS, it seems an interesting future direction to see if there are more implicit versions of all the criteria when a space is frequented by users in a way that allows for norm setting.

Finally, we feel that this approach to researching open FLSs - phenomenological interviews - has promise for understanding these less structured spaces. Getting beyond a cataloging of the physical space and the activities that happen there, and focusing on the essence of the experience of the users of the space can illuminate the subtle contributions of space to learning contexts. It may be that phenomenological approaches could be useful for more formal learning spaces as well. Regardless, we need to innovate methodologically if we are going to get analytical access to the kind of subtle, but potentially powerful, learning experiences that occur in the increasing number of open, collaborative, and individually organized learning spaces in our schools and on our campuses.

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