CREATIVITY FLOURISHES USING HYBRID SPACE PATTERNS

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ABSTRACT

Current architectural educational design solutions are challenged by recent, multiple paradigm shifts: changes in societal culture, research on how we learn, educational methods (passive to active learning), and an emphasis on collaboration and participatory creativity. Evidence indicates that collaborative creativity is essential for innovation, and creativity flourishes in contradictory patterns of cultures, settings, and behaviors. "Design and space do matter" in supporting innovation and a culture of a place, particularly in learning-driven domains. The research studied how an active, adaptive design approach might emerge as a support for these paradigm shifts relative to the learning and creative processes. This chapter investigates how hybrid spatial patterns may support a collaborative culture with participatory creativity. It further aims to present a relationship between learning, creativity, and space by introducing hybrid patterns of architectural affordances that may promote new learning behaviors impacting collaborative creativity. The research design used a mixed-method protocol: (1) content analysis of design awarded learning and working environments, (2) survey and interviews, and (3) a Post-Occupancy Evaluation ethnography using behavioral observations and photographic traces techniques. The convenience sample was the Innovation Center at Illinois Institute of Technology, Chicago, USA. Analysis of the findings provides a new pattern language of contradictory cultures, settings, and conditions supporting creativity and learning. Three factors emerged: (1) convergent and divergent cultures reflecting modes of thinking, (2) private and public conditions reflecting the needs of the individual vs. the collective, and (3) concrete and abstract settings relating to passive vs. active spaces and behaviors. In an effort to provide information and guidelines for the educational and design communities, this chapter introduces a hybrid, active system of spaces related to cultures of learning, and environmental behavior, promoting collaborative creativity; fostering a new relationship between education and architecture.

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"….. Creativity emerges on the edge of chaos
while related to navigation between people, knowledge, and ideas."
Montuori & Donnelly, (2013, p. 60)

1.   BUILDING A NEW RELATIONSHIP BETWEEN EDUCATION AND ARCHITECTURE

Current architectural solutions are being challenged (Boyes, 2011). Studies show that new, more active models for spatial solutions enhance engagement levels between all users and influence the culture of learning. After approximately 200 years of passive and controlling educational situations, active learning teaching methods have emerged, supported by similarly designed educational facilities. Looking back, ideas referring to space as a learning tool were developed through educational approaches, including classical examples led by Maria Montessori (1913) and Reggio Emilia (Malaguzzi, 1950). These two entities brought forth some unique architectural ideas, all of which remained mostly a local phenomenon.

One of the most influential architects, Herman Hertzberger (Dudek, 2000) from the Netherlands, was the first to connect the school's social values supporting learning with architectural qualities in the Montessori schools he designed in the1980s' in Amsterdam. The values, which his schools represented were considered an example of significant historical development in school design. Herzberger demonstrated new methods of inviting social connections between the users by suggesting a unique organization and details advocated by the built forms (Dudek, 2000). This relationship created a potential for a friendly environment for the user and impacted the connection between form, social behavior, and the bond between the user's identity and the place. Hertzberger's famous statement, "We interpret form, but it also interprets us" (Hille, 2011, p. 11) explained his notion of the human connection to space.

Understanding how we learn (Ambrose, Bridges, Lovett, DiPietro, and Norman, 2010), empowers the development of active and informal educational practices and the understanding of the learning processes. It challenges architecture to become more active and engaged holistically with the learning and the learner. These developments raised questions about how spaces influence the culture of learning and the learners' engagement and performances academically and socially. The COVID-19 pandemic has heightened our awareness of how we learn and teach and expanded the meaning of the "where." The definition of space becomes broader and more hybrid (Mor-Avi, Johns & Emmons, 2021). With this new understanding and the contemporary notion of collaborative creativity, this chapter adds to this text by (1) exploring the spatial design as a reflection of the culture of learning, (2) the multi-verse of creativity, and (3) the meaning of hybrid affordances. The chapter further offers a sampling of the findings from a Ph.D. dissertation on the connection between space and collaborative creativity explored by how hybrid spatial patterns may support the complexity of learning and creativity. This research study argued that space has the potential to empower learning by providing hybrid and contradictory architectural qualities, messages, and patterns to empower an innovative learning culture and creativity; "building cues."

2.   SPATIAL DESIGN AS A REFLECTION OF CULTURE

According to Seeling (2011), habitat is one of six important components supporting an innovative engine. Culture can be empowered by space when echoing the new culture conceptually but could hinder a new culture's success if not aligned with its conceptual ideas (Grove & Marlow 2016). According to Groves and Marlow (2016), spaces reflect a place's culture through its architectural qualities, including: atmosphere, layouts, finishes, colores, thermal conditions, etc. For hundreds of years, traditional learning spaces were formal, private, and controlling educational experiences using rigid, closed, inverted, and fixed design solutions. Today, education is a more public domain, supporting informal, social, and emotional approaches, emphasizing soft skills (i.e., character and interpersonal skills) and freedom of choice. Accordingly, the spaces' cues and messages have become more flexible, open, human-centered, transparent, soft, movable, and support multiple options

Space is an echo of culture and can support the desired learning behaviors needed for evolving new cultures of learning today. Architectural qualities and elements (called affordances) create cues and suggestions for behaviors and feelings. This term, architectural affordance, is related to an object's properties that show the possible actions users can take with it and was introduced in the study of cognition by the American psychologist James J. Gibson (1966). Therefore, affordances are a mechanism between users and objects (e.g., layouts, furniture, finishes, thermal conditions, etc.) (Mor-Avi, Mimica & Scott-Webber, 2019). Studies exploring the influence of spatial affordances, messages, and cues on learning, learners, and faculty will be introduced next.

Space Does Matter

According to recent studies, there is a strong empowering connection between learning activities, behaviors, and spatial affordances, as paradigms shifts affect spatial solutions and move from a more teacher-centered focus to a learner-centered one, from formal- to informal- and passive- to active-teaching models (Scott-Webber, 2014; Scott-Webber, Konyndyk, French, Lembke & Kinney, 2017).

A literature review conducted by Talbert and Mor-Avi (2019), found several themes between spaces promoting learner-centered and active learning with informal learning. It then connected these models with evidence showing improved student learning outcomes, student engagement in several forms, and a positive connection with the instructor's practices and beliefs. Moreover, the interaction between the active learning approach and the spaces which invite students and faculty to be active by mobility, visibility through analog and digital tools have a significant, system-wide impact on schools' social and collaborative cultural patterns. The research highlights a growing understanding that space is the third component of effective learning experiences, complementing pedagogy and technology (Talbert & Mor-Avi, 2019).

The study introduced in this chapter aimed to explore specifically the influence of space on creativity. The next section shares the issues related to the complexity of creativity.

3.   THE MULTI-VERSE OF CREATIVITY

Social values (Scott-Webber, 2014) and collaborative creativity (Sawyer, 2007; Clapp, 2016) play essential roles in learning and teaching approaches for the 21st Century. As a result, new teaching models and strategies enhance active learning with more "collective" (e.g., group settings and team project strategies). According to the World Economic Forum, in 2020 (Belsky, 2020), creativity becomes one of the three most desired skills along with critical thinking and complex problem-solving; all are keys to competing against Artificial Intelligence (AI) in the future workforce.

In 2006, Sir Ken Robinson, a British educator, drew attention to the need for creativity in the most-watched TEDTalk lecture ever – "Do Schools Kill Creativity?" He claimed that the world needs a creative and innovative society. Public and professional attention was irreversible, and the discussion about how to unleash the creative force of the students through introducing new educational approaches was and still is in developing stages" (Robinson & Aronica, 2015, p. xix-xxvii). The issue of developing a creative culture and connecting to the creative child is not new and has been addressed as a desired value throughout the years. From the 1950s, creativity was connected with art and science educational institutions that expanded their facilities to create new places for artistic activities. Creativity was considered an act of the individual, and only at the beginning of the 21st Century was contemporary creativity introduced as a collaborative process (Clapp, 2017). Today, creativity is considered a skill with the potential to empower economics (Robinson & Aronica, 2015).

The notion of creativity is dynamic, and as of the beginning of the 21st Century, creativity's concept was changing; reflected both as a concept and as a practice. Creativity, then, becomes part of everyday life performed by "everyday people" potentially everywhere, not related in particular to art or science courses. Creativity is connected to human relations and is recognized as a collaborative process. New research on innovation, group creativity, and the crowd's wisdom all argue against the individual as genius (Montuori & Donnelly, 2013). Another concept related to creativity is dualism and is shared next.

Dualism (i.e., the division of something conceptually into two opposed or contrasted aspects) is part of our modern thinking and knowledge. "Social creativity," which is a holistic way of examining today's definition of a successful creative process, needs to be evaluated according to Montuori (2000) beyond the cultural divergence of individualism and collectivism. Montuori suggests looking at the term "social creativity," which in the past was considered to be an Oxymoron, through several dual and hybrid lenses as self-society, creativity-conformity, and order-disorder. His suggestion aligns with the claim that this new era is marked by chaos, contradictions, and complexity (Bauman 2005; 2007). At one time, the world was defined by "solid" assumptions related to jobs, gender roles, genders, economic, and more, but it has become "liquid" and ever-changing (Bauman 2005; 2007; Montuori & Donnelly, 2013). According to social theorists and demographers, the Western world as a whole is undergoing a generational shift from "I" to "WE" (Greenberg & Weber 2008; Leadbeter, 2008; Howe & Strauss, 2009; Williams & Drew, 2012; Montuori & Donnelly, 2013). Therefore, the current notion of creativity represents a shift from the top-down culture to the participatory culture, which signifies the new relationship between "self and society." This concept is evolving and represents the collaborative, distributed creativity (Glăveanu, 2013), and the issues of "I" and "WE" (Glăveanu, 2010).

Reflecting upon the above paragraph, cultural paradigm shifts may offer the current understanding that creativity flourishes through contradictory situations. As Montuori & Donnelly (2013) argue,

> " *Creativity is fundamental…..and evolving from contradictory as* **order** *and* **disorder**, **rigor** *and* **imagination**, **hard work** *and* **play**, **solitude** *and* **interactions**, *and* **sharing**. *The critical tension between those contrasts suggests that* **creativity emerges on the edge of chaos** *while related to navigation between people, knowledge, and ideas (pp. 59-60)."*

In addition to the idea that creativity is fundamental, it is as well a networked, ecological, relational emergent process that evolves from contradictory performances, as mentioned in the above citation (Montuori & Donnelly, 2013). Thus, it is suggested that creativity flourishes in hybrid patterns and, accordingly, contradictory spatial cultures and affordances. Since space may empower cultures and behaviors, as mentioned earlier, this study's goal was to investigate the ways architecture may offer cues to promote creativity in learning-driven environments. An overview of the methodology and the findings related to will be next.

4.   SPACE, CREATIVITY, AND SOME FINDINGS

The dissertation explored the connection between creativity and space. It used a mixed-method research design to ensure bias was controlled. There were several techniques included: (a) content analysis of sixteen (16) architectural awarded designs of projects in the kindergarten to corporate learning areas, and (b) Post-Occupancy Evaluations (POE) incorporating (i) survey, (ii) interviews, and (iii) behavioral methods – onsite observation and photo traces. A convenience sample was used to gather the data.

The first technique was a content analysis of sixteen learning-driven, architecturally awarded environments. The range was from Kindergarten (K)-to-corporate settings. All of which had won major awards or significant recognition for innovative solutions. This technique's aim was to develop a collection of architectural attributes and patterns to create a coding system for analyzing photos consistently.

Analyzing these projects resulted in two major, clear, yet contrary patterns:
- Pattern One was defined as formal, closed, mostly with fixed solutions, hard barriers, teacher-led model, and suggested passive behaviors.
- Pattern Two was defined as informal, open, movable, with soft barriers, visual and audio connections, incorporating more student-led model, and suggested active behaviors (Figure 1).

Figure 1. Informal and Open (Aqua); Formal and Closed (Blue) Spatial Patterns (Mor-Avi, 2020)
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The second technique used Post Occupancy Evaluations (POE) incorporating ethnographic methods: (1) environment-behavior analysis through eighteen (N=18) interviews with closed and open questions, (2) twenty-five (N=25) observations during one week in randomly selected times, and (3) surveys of faculty (N=35), undergraduate (N=95), and graduate students (N=10). The American Institute for Architecture (AIA) awarded innovative building, Kaplan Institute, at the Illinois Institute of Technology in Chicago designed by architect John Ronan was the convenient sample. A sampling of the POE's findings relative to creativity is next.

One of Kaplan Institute's (the convenience sample as a designed building) design goals was to support a collaborative culture, and it has extensive visual and audio connections throughout the building. These attributes were to offer opportunities to discuss if and how space designed to promote an extensive collaborative culture could support creativity as well. Research questions focused on understanding the overall experience of the architectural qualities and elements that might

enhance the collaboration and creative processes. In the surveys, the interviews, and the observations, two main issues related to creativity were dominant; the first was privacy, and the second was the balance between spaces inviting passive behaviors to those offering active behaviors. The survey had several aims. The first was to discern if there were perceived connections between a particular set of affordances representing building performance patterns and those supporting the creative process.

It was evident in the interviews that privacy is complex and has many meanings related to behaviors, the culture of a place, and space when learning is performed. Seventy percent (70%) of the interview participants mentioned the lack of privacy at least one time. The option to see and be seen through visual connections was appreciated, but 60% of the respondents found it a challenging influencer when no control was offered. Some expressions addressed by interviewees as influencing the perception of privacy included a sense of ownership and physical ownership, authenticity, intellectual and physical safety, confidentiality, physical proximity, and control on visual and auditory connections. Some of the responses were: "Transparency; bridge the trust between people.... but when no place to hide....you feel vulnerable." ...."I'm using head-phones to create personal space – by students."

The second area for the questionnaire was regarding the influence on the learner when space performs in a passive cultural manner (e.g., activities being suggested by strong cues) or active culture (e.g., low cues with movable elements). Many interviewees were connecting a better collaboration experience with low cue affordances promoting a flexible and active culture. It was evident that the need for the learners' participation in creating and designing the space for their needs and the project needs is noteworthy. However, some users felt the need for those secured places that do not change at all. In the observation, it was evident that many of the movable writing partitions were used intensively, not only for writing but also for defining more personal space in the public areas.

In summary, findings from the surveys, interviews, and observations indicate that spatial affordances ranging from fixed-to-flexible and offering private and public settings are important affordances supporting the creative processes. To articulate these findings, a Taxonomy of Affordances was developed using three dichotomies: (1) privacy vs. public, (2) concrete for strong cue vs. abstract for low cues, and (3) a dichotomy reflecting the culture of convergence vs. the culture of divergence (see Figure 2)
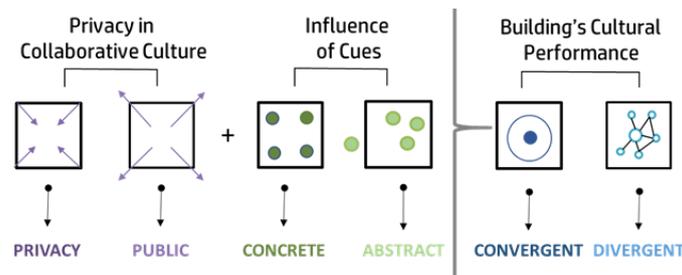

Figure 2. Hybrid Affordances (Mor-Avi, 2020) © Anat Mor-Avi 2020. All Rights Reserved.

It may be argued that these contradictory affordances offer a hybrid experience. Contradictory cues that allow for both private and public, abstract and concrete settings - give a hybrid experience.

5.   HYBRID ARCHITECTURAL AFFORDANCES - DETAILS

This section provides more details on these contradictory architectural conditions, settings, and cultures.

Private vs. Public Conditions

Affordances related to private spaces are considered those that separate, and public spaces are considered those which connect. Each has a range of visual and audio proximities for the main relevant qualities. Separating settings provide physical qualities, including partial or full-height walls, opaque boundaries, or transparent spaces with full curtains. These types of spaces offer individuals or teams a degree of quiet, full- or semi-isolation, confidentiality, and control over visual, auditory, and physical interventions (see Figure 3).

Figure 3. Private Individual Pod (Left), Semi-private Pod (Middle), and Public Setting (Right) (Mor-Avi, 2020)

Public space is often considered a social space and is generally open, accessible, and inclusive to all learners offering opportunities for academic content sharing. Public spaces provide audio and visual connections supporting both analog (i.e., non-digital means of communicating) and digital connectedness between users. These spatial types reflect the notion of education as a public domain. Examples from the interview quotes related to privacy and public are associated with closed, transparent, and exposed conditions were, "I need to use a closed classroom to make a phone call" (closed)…" I feel like a fish "…(transparent)" you feel more vulnerable" (exposed)..." no place to hide. – student" (transparent).
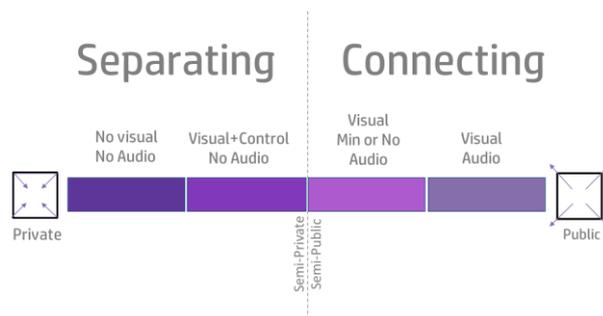
Figure 4. Patterns from Private and Separating to Public and Connecting (Mor-Avi, 2020)

The findings show the need to include both qualities of separating and connecting with a range of semi-public and semi-private affordances with control over the visual and the audio, all to support different creative learning stages (see Figure 4).

Concrete vs. Abstract Settings

As described above, the influence of spatial qualities on passive and active behaviors was also dominant in the interview responses. Concrete affordances represented spaces that provide strong cues suggesting specific behaviors and were generally affiliated with passive and formal learning. The need for some ownership and authenticity, which may lead to self-actualization, were mentioned forty percent (40%) as supporting student success. It was clear that in pre-defined and fixed settings, where the learner is "invited" by the space to be a passive learner, ownership, authenticity, and spontaneous collaboration were not evoked. Part of these behavioral responses may be related to behavioral conditioned experiences caused by repeated situations over an extended period of time.

Figure 5. Kaplan Institute, IIT – Concrete, and Fixed (Left Images) vs. Abstract and Movable Settings (Right Images) (Mor-Avi, 2020) © Anat Mor-Avi 2020. All Rights Reserved.

The images on the right, in Figure 5, represent abstract, low cue settings informal, movable, and more ad-hoc activities and supported messy, dynamic, and active learning activities. They have movable writing boards and soft seating, which the users may define to provide a more intimate space for an individual or team activities. These attributes of low cues are decidedly different from those using strong cues. The images of strong cues include fixed seating stairs, the computer stands, and the kitchen table

These solutions encouraged a "move to learn," and were defined by current users, mostly as "informal" spaces. Affordances for these spatial types are seen as being more user-centered solutions inviting the learner and the learning facilitator not to take the space layout as a given but to re-design the space according to the desired activities and needs (Mor-Avi et al., 2019).
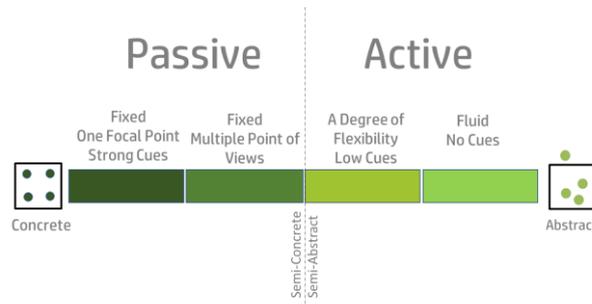
Figure 6. Patterns from Concrete and Passive to Abstract and Active (Mor-Avi, 2020)

The findings shown in this category suggest that all ranges between passive and active spaces with different degrees of flexibility and architectural qualities are important to support collaborative creativity among individuals and teams and provide more choices and control (see Figure 6).

Convergent vs. Divergent Cultures

The third category of affordances was collected from the POE and is complementary to the two previous categories. This category represents opposite cultures and is related to spaces performing as anchors vs. spaces that act as a network system associated with current social and educational discussions (Ito, 2013).

This category comprises two patterns based on two situational cultures representing two very different modes of thinking. These are: (1) divergent and (2) convergent; both essential for creativity. These two situational cultures' needs should be reflected with intentional designs for spatial types. Situational Culture #1: Creative thoughts evolve when the brain is occupied with other activities simultaneously, allowing for divergent thinking. A divergent culture supports a network of creative and expanded connections between ideas, people, and knowledge. The divergent concept then is characterized by a networked setting, associated with a multidisciplinary approach, freedom to wander, and an appreciation of the learner's interests and needs. The affordances related to divergent culture might offer informal, ad-hoc, fluid, and changeable settings, inviting more just-in-time connections to happen, as well as messy activities. Situational Culture #2: Divergent patterns are contrary to convergent thinking, which benefits from having a clear mind and quiet surroundings. A convergent culture needs more anchoring and consolidating places to process creative thoughts. The affordances correlated with the converge culture represent a collecting concept symbolizing a congregation assembly, a centralized anchor. The assembly set represents a familiar protective place (see Figure 7).
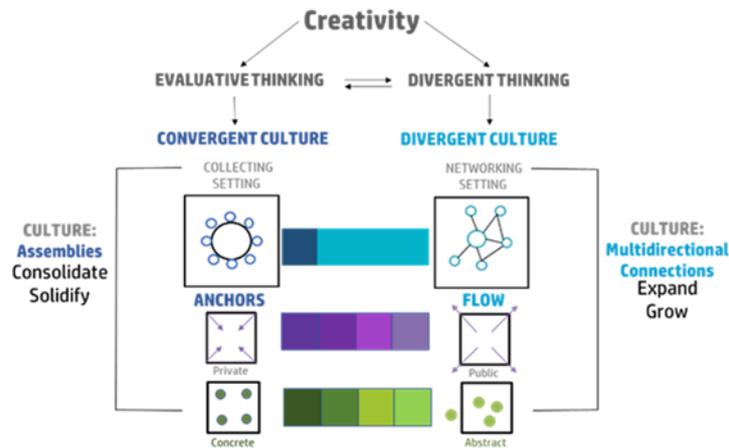
Figure 7. Hybrid Affordances Empowering Creativity (Mor-Avi, 2020)

A decentralized network of affordances is characterized by multidirectional designs, flow, and soft connections between different affordances by a system of movable hard and soft partitions and furnishings (Mor-Avi, et al., 2019). Creativity and hybrid patterns are described next. There are multiple methods used to develop design solutions for particular places. This next section explores three: planned, unplanned, and hybrid as they relate to the creative process.

6.   CREATIVITY AND HYBRID PATTERNS

As the fundamental concept of creativity, (which calls for creating new connections from the known to establish a novelty), space enhancing creativity should reflect the unknown emerging from the already known, defined in architectural terms - **planned and unplanned**. This section also introduces a new concept for the word 'hybrid' relative to the learning place. In this case, hybrid is operationally defined as an intentionally planned convergence of spatial types known to support creative endeavors.

The planned and unplanned concepts resonate with Wilson's (2009) structural model of the **teacher-led, didactic learning environment, passive setting,** and the self, or **learner-led, unstructured learning environment** as the **active setting** (Ellis & Goodyear, 2016). Planned and unplanned patterns echo with this research study's content analysis findings and were described as formal and informal learning spaces. These two spatial types invite a range of activities supporting both **didactic-learning in the formal spaces,** and **unstructured-learning in the informal spaces**.

The POE method reveals that students and faculty maybe empowered by contradictory affordance patterns when performing creative processes. Therefore, it is suggested that creativity flourishes in hybrid affordances of both private and public settings, concrete, and abstract conditions, complemented by convergent and divergent situational cultures. This suggestion connects with the contradictory performances of solitude and interactions, order vs. disorder, and rigor and imagination introduced by Montuori & Donnelly (2013) as the catalyst for creativity. It also resonates with the concept of Christopher Alexander's (1977), which describes common design problems as arising from "conflicting forces," and proposes through

the development of patterns a set of values connecting the built environment and the human essence with a purpose to guide the designer toward the best decision.

It is also suggested that the conflicting forces of the concrete, abstract, private, public, convergent, and divergent af-fordances, and the gradual range of the architectural qualities between these hybrid forces represents a pattern's values (refer back to Figures 4 & 6). Therefore, situational Culture #3. Offering a system of hybrid networks connecting af-fordances supporting learning needs and productive collaborations is the foundation for some order in the complexity in which creativity flourishes (Mor-Avi, 2020).

Working from the suggestion by Montuori & Donnell (2013), it is argued in this research study that space for collaborative creativity should also perform as a networked, dynamic, social emergent process to support the dynamic domain of edu-cation. Therefore, learning spaces should consider including:
- Planned CONVERGENT with CONCRETE attributes – familiar, fixed, passive anchors; with
- Unplanned, active, and organic, DIVERGENT cultures, with ABSTRACT settings ready to be changed according to the learning process and the learner's needs.

All of which are related to steering between a 'governed' process and a natural process among learners, knowledge, and ideas (see Figure 8).
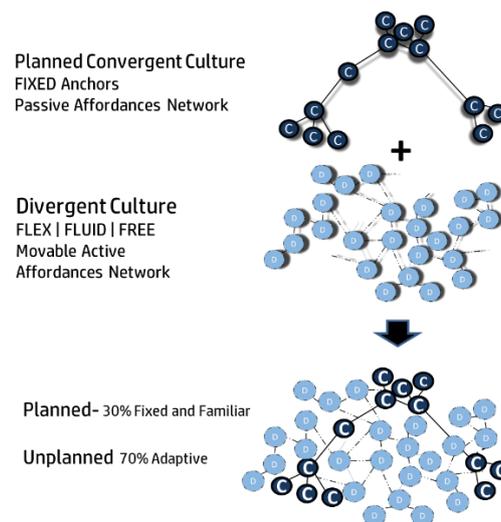

Figure 8. Networks of Hybrid Culture Patterns (Mor-Avi, 2020) © Anat Mor-Avi 2020. All Rights Reserved.

A divergent exploratory and insightful thinking for solving problems is the core of collaborative and creative culture. Therefore, it could be argued that spatial solutions supporting collaborative creativity should offer a *more* divergent culture and *less* convergent culture to allow for creativity to spark. Convergent cultural patterns supporting evaluative thinking should be complementary to the divergent culture patterns.

7.   HYBRID AND DYNAMIC– LEARNING-DRIVEN ENVIRONMENTS

Generating architectural solutions incorporating a hybrid, adaptive, and active system of patterns to empower innovative learning cultures and approaches is important. The constant cultural flux on innovative learning methods needs to be supported by a hybrid and dynamic system of spatial affordances; affordances supporting a wide range of learning activities that can be reconfigured every day in new ways and echo the needed agility in learning. A more "poetic way" to understand patterns is introduced by Leitner (2015). He argues that a simple word pattern is only the starting point of a new way in scientific thinking when dealing with complex systems and creative processes. Sets of patterns are used for collaborative forms of design and become a live system with its structural and functional complexity. Leitner (2015) refers to his idea when talking about 'alive,' but not the biological system with the German word *lebendig*, which is more abstract in its association. This point of view compares with using a pattern language when connecting architectural qualities to the dynamic domain of education.

The positive effects of space on learning may grow when spaces offer a range of affordances supporting different learning cultures and learning behaviors. The system of patterns then becomes a "tool" for teachers to address their curricula requirements. Space becomes part: of the curriculum, of the course, or the class when offering settings and conditions that enhance the needed behaviors. By offering the appropriate setting type for specific learning activities and behaviors, educators have the opportunity to express the expected behavior through space; it offers them the cues.

It is argued here that an adaptive system, like a "kit of parts," offers all users, faculty, and students to decide what attributes to promote, whether that be the: (1) culture, (2) behaviors, (3) emotions, and (4) architectural properties. Supporting users' emergent and creative needs, four types of design patterns important in empowering collaborative creativity are offered (see Figure 9):

- Fixed Patterns **-** sets of anchors, assembling different groups or individuals mostly but not only to allow for maximum control regarding visual and audio connections for private conditions;
- Flexible Patterns **-** a flexible system of affordance divisions allowing for semi-private and/or semi-public conditions with some control over visual and audio connections;
- Fluid Patterns **-** agile solutions by providing movable partitions for configuring and reconfiguring spaces at will, and as needed by the user providing semi-public conditions; and
- Free Patterns **-** open public spaces with full visual and audio, with only movable elements to empower connections for different engaging and spontaneous opportunities.
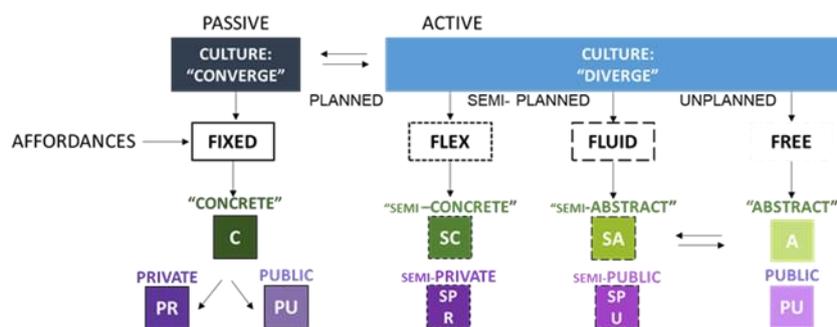
Figure 9. Overview of the Hybrid Patterns (Mor-Avi, 2020) © Anat Mor-Avi 2020. All Rights Reserved.

An example might help in understanding these ideas. Promoting active collaboration benefits from having a fluid- or free-open public space with low cues allowing for spontaneous interactions, expressing and sharing visible learning with movable elements. Collaboration becomes more intuitive for the learners when supported by sensitive affordances promoting collaboration, connectedness, and creativity. The "where" becomes part of the behavioral system for learning. This organic system is complex and, at times, creates messes in spaces. However, since creativity emerges on the edge of chaos, spaces that emerge into the learning process should, to some degree, reflect this concept. Architects and educators should accept it as a positive characteristic of spaces supporting creativity.

Spaces with changeable, hybrid patterns with a range of conditions and an adaptive system of affordances, rather than final, fixed forms and linear solutions, offer more natural learning processes. It eliminates the perpetuation of the "one design fits all" mindset. Therefore, architects and educators might refer to spaces promoting collaborative creativity as an organic and agile product.

8.   FINAL THOUGHTS

In summary, this chapter has taken the reader through innovative ideas including: (1) sharing the notion that spatial designs are a reflection of a situational culture, (2) that the collaborative process and the multi-verse of creativity are important concepts to consider, (3) space, behaviors, affect emotions, (4) some research findings from the Ph.D. dissertation were shared, (5) hybrid affordances were offered with details, (6) creativity was connected to new "hybrid" patterns, and (7) hybrid and adaptive spatial attributes were also shared.

This chapter offered design attributes that may permit the intentional support of a range of behaviors and cultural norms and may support the empowerment creativity, support motivated individuals, and fruitful collective and emergences into the intuitive learning process.

It is understood that in this era, designing for the learning process is a moving target, and designing for today's learning might be obsolete tomorrow. Space offering a dynamic, hybrid, active, and student-centered system of spaces could support the collaborative, creative learning needs for the 21st Century and beyond. This chapter has introduced the reader to the process and some of the findings relative to the research work done on a Ph.D. dissertation. More information will be forthcoming in future publications.

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