Transitional Spaces in Higher Education as Efficient Informal Academic Learning Spaces

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ABSTRACT

At present, the outgrowth changeover in teaching pedagogies highlights the critical needs of changing perspectives from Teacher-Centered to Learner-Centered pedagogy specifically in the higher education. The influence of learning space turned more prominent due to transformation in pedagogical practices in higher education. As learner's learning styles, aspirations and expectations evolve, it is clear that learning environment need to evolve with them. Consequently, there are needs in the establishment of ideal types of social or informal learning space which promote learner-centered pedagogy. Furthermore, learner-centered learning necessitated that a notable amount of learner's learning time is anticipated to be spent outside-classroom. This fact elucidates the demand for exploring the transitional spaces as informal academic learning space, such as (1) transition between two destinations: internal corridors and entrance lobbies; (2) transitions between exterior and interior: courtyard and external corridors; and (3) transitions between natural and buildings: gazebo and square are utilized in order administering their self-directed learning activities. Consequently, in the research, a qualitative study was adapted to investigate correlation between the space and learners' utilization and attributes at higher-education transitional spaces in Polytechnics. The independent and dependent utilization of higher-education transitional spaces were observed using walkthrough and focus group technique based upon four behaviour setting factors - space, time, people and objects. The study concentrated on the transitional spaces within the academic zone of Ungku Omar Polytechnic whereas the focus was on the full-time diploma students of Polytechnic including technical and non-technical courses. Students' social behaviours, social interactions and social gathering in Polytechnic transitional spaces are essential issues in analysing the learner's psychology and their social interaction needs. The results from this study provide designers and planners a key concept of human behaviour in the design process of Education Eco-System in Malaysia. Moreover, it provides the different paradigm for the making of place rather than focusing on aesthetics and appearance as priority criteria for design. Additionally, this study shows the optimum utilization of higher-education transitional spaces by learners'. As a result, the final outcome of the study contributes toward creating an ideal informal learning environment to enhance the education 4.0.

Keywords—Informal learning space, Transitional spaces, learners-centered learning, Environment-Behavior, Human behaviour

1. Introduction

In consideration of future education trend domains, current students shall be groomed to encounter the requirements of society 4.0 and industry 4.0. In which, the extensive application of Information and Communication Technology (ICT), coining the term Industry 4.0. Due to this, Industrial Revolution 4.0 has been enforced in many other fields, such as

Education, Medical and Manufacturing Engineering as well (Wallner & Wagner, 2016). Therefore, an ideal academic learning space becomes decisive matter and has been crucial debate topic among academician cross the globe (Norhani Ibrahim, Fadzil, & Saruwono, 2013; Nenonen, 2015). We can't refuse that, everyone proceeds through learning at every moment whether formally or informally, Furthermore, learning is a paramount component of life (Amit kumar, 2015). Higher education is now moving ahead from boundaries looking into the requirements and compatibility of Next Generation Learning Space whereby merged by formal, informal, and virtual learning Environment (Figure 1) (Jones & Dexter, 2014; Sommerauer & Müller, 2015). As mentioned by Brown and Lippincott, (2003) that more learning is taking place outside of class time than ever before. For this reason, it is predominant to discover new arise concept of informal or social learning space at more promoting student engagement and learning experiences (Amit kumar, 2015; Dole et al., 2016; Wilson & Cotgrave, 2016).

At present, behavioural factors play an important value by integrating with other values such as a function in affecting the learning built environment. Whereby, these research explore the interdependence between the environment and human-behaviour and also distinguish the important in the design process of academic learning spaces based on Behaviour Setting Modal by R. Baker (Nassar & El-samaty, 2014; Schuster, Grob, Vossen, Richert, & Jeschke, 2016). Today's teaching and learning strategies are as diverse as never before. For examples, different types of media services, software for teaching and learning as well as innovative hardware solutions emerge as a bigger part of higher education (Schuster et al., 2016). In fact, learning becomes additional collaborative due to digitalization of education (Johnson, L., Adams Becker, S., Estrada, V., Freeman, 2014) and transformation from teacher-centered to learner-centered pedagogy (Norhati Ibrahim & Fadzil, 2013)

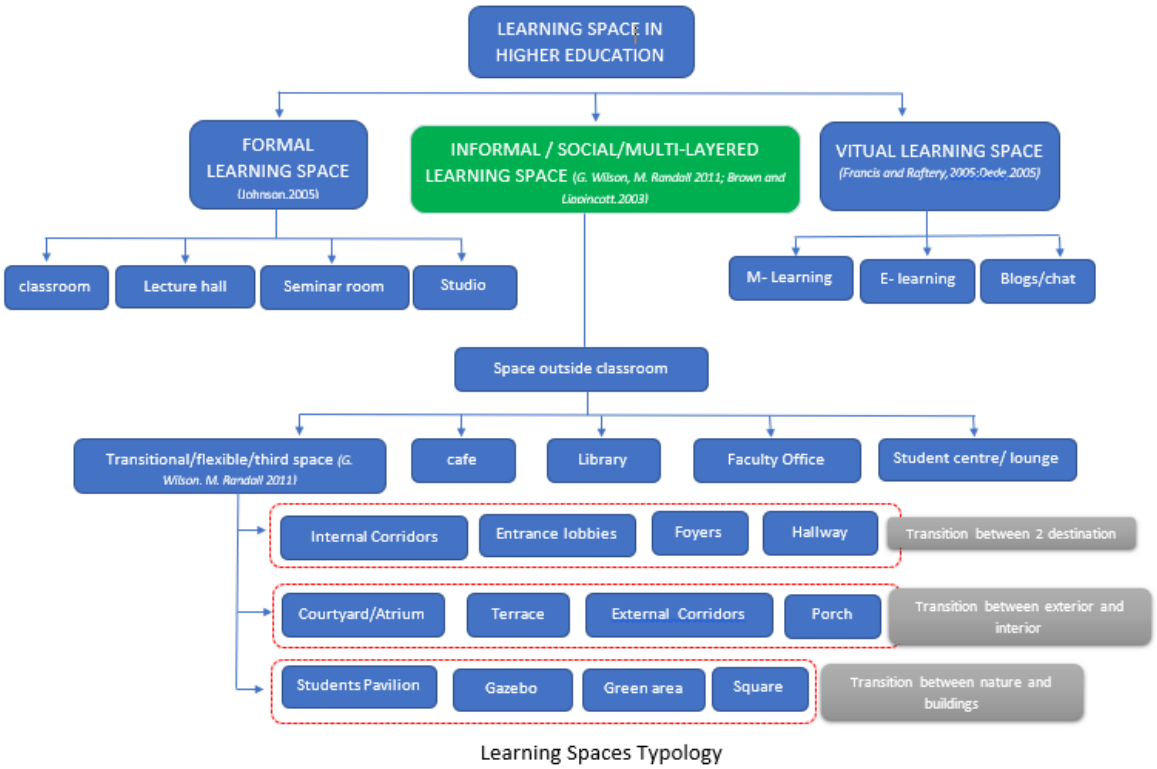


Fig. 1. Typology of Academic Learning Space

Source: Author

2. Literature Review

2.1Learning Environment

In recent years, the learning environment has become a focus of research and expanded the field of academics inquiry within elementary, secondary and post-secondary research (Barry J. Zimmerman, 2013). The relationship between the environment and learning consist of science education, environmental psychology, campus ecology and architecture (Zandvliet & Broekhuizen, 2017). As we know, learning institutions are more nexus, dynamic in systems that influence learners' academic, affective, social and behavioural learning (Bascia, 2014; Crick, Barr, & Green, 2013; Gu & Johansson, 2013). The achievement of students in higher education is based on several different domains such as skills, experiences, school climate and outcomes. Indeed, the school climate is one of the key factors of school's impact on students learning (Bascia, 2014). Basically, school climate can be widely organized into school safety, interpersonal relationship, teaching and learning practices, and organizational structures (Bully & Efforts, 2013). Beside school climate, school contact also shapes core proses of teaching and learning. Based on Deakin Crick et al, (2013) conceptual model of the school contact, the fundamental process in school is learning and the main actors in school are leaders (administrators and teachers who lead for learning) and teachers (especially teachers' professional learning) as well as students (engagement in learning and achievement).

2.2Informal learning

Informal learning is about something has been happening for many years at all educational levels, history over the past 50 years (Cunningham & Walton, 2016). Moreover, informal learning spaces are not governed by the school or externally but is under learner's superintend (Greenhow & Gleason, 2014; Greenhow & Lewin, 2016), exploratory, self-directed and spontaneous (Yang, Crook, & Malley, n.d., 2015). Most researchers use the terms of formal representing the encompass of the classroom and informal confines everything else from after-school clubs to the home (Ranieri & Bruni, 2014). The conception of informal learning often associated with non-formal, not-school learning. Whereby, it has certain objectives (self-directed learning) and seeks information from sources that may include peers, mentors, or media. As mentioned by Jamieson G. Matthews & Walton, (2013), informal learning is a form of a complex web of experiences and interactions, undertaken over a wide range of physical environments, from internal up to external which inclusive classrooms, cafes, plazas, transitional space, enclosed learning spaces and libraries (O'Neill, 2013) as shown in figure 1.

Brown and Lippincott, (2003) claimed that more learning are taking place in informal learning space than in the formal classroom. As mentioned by Matthews, (2011), students who utilize the informal learning spaces delineate the higher level of students engagement and positive correlation compared to non-users. In fact, there is a fair interdependence between the quality of Informal learning space and learner's behaviour and success (Doshi, Kumar, & Whitmer, 2014). Beside formal learning, the questions of how the learners use the spaces and how it can be improved have to take into account as well (Hunter & Cox, 2014). Similarly, the concept of informal learning is very much associated with the idea of Third Space which developed by Oldenburg, (1998). Indeed, third space is a space where social gatherings that take place in the first space (home) and the second space (work) occur. Miller Cunningham & Walton, (2016) researched the concept of third space and found that its seen as hybrid spaces, neither home or personal space nor a formal classroom or public setting. Conversely, it an area where learners can choose to study independently, mingle with friends and collaborate with stuff as preferred. As a result, it is embodied by accessibility, purposefulness and its ability for informal gatherings.

The recent trends in learning and teaching brought forward the importance of the informal learning spaces. The teacher-centered learning has replaced with the student-centered approach where the significance is on the construction of knowledge by shared situations. AMA (Alexi Marmot Associates) and HAA Design (Council, Alexi, & Associates, 2006) have

indicated seven distinctive spatial classifications of learning space which required to reinforce the changing pedagogical styles. In particular, group learning space, peer to peer and social learning spaces, learning cluster and individual study spaces are very much affiliated to informal or social learning space. Furthermore, Committee on Learning Science in Informal Environments (Bell, Lewenstein, Shouse, & Feder, 2009) reported there are six interconnected characteristics that well distinguish what learning looks like in informal settings: 1) the nature of informal learning motivated the learner's to learn because is driven primarily by learner's interests and excitement; 2) readily generate, understand and adopt concepts related to science; 3) make sense of the world by scientific inquiry practices; 4) look at science as a method of knowing and reflection on own learning processes; 5) actively participate in collaborative activities and learning process with peers by optimizing scientific language and gadgets; and finally, 6) portray themselves as science learners and establish identities. Nevertheless, the biggest challenge is how to design exhibits and programs that promote learning experiences. In truth, as claimed by Boys, (2010) that there was "almost" no records regarding this research on this area which help to assess the effectiveness of the new and adapted learning spaces across higher education institutions. As claimed by Quinnell, (2015) University spaces are designed lacking with an appropriate interpretation of what learners desire and in what manner they used the informal learning spaces (Harrop & Turpin, 2013). Therefore, this matter has kick-start some evaluation have competed in some various informal learning spaces in higher education such as at Huddersfield University (Harrop & Turpin, 2013), Sheffield University (Hunter & Cox, 2014) and the Georgia Institute of Technology (Doshi et al., 2014).

3.Research Method

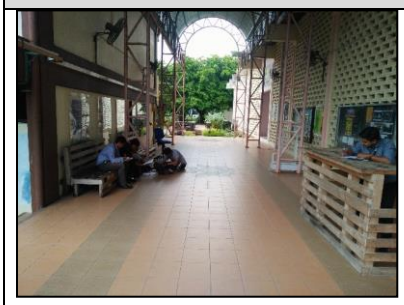
The research was carried out in the transitional spaces within the academic zone of Ungku Omar Polytechnic Malaysia involving full-time diploma students including technical and non-technical courses by applying observational and focus group method as figure 2. Ungku Omar Polytechnic was established by the Malaysian Ministry of Education with the help from UNESCO in 1969 and one of the first Polytechnic in Malaysia. Selected informal learning spaces are within the academic zone and vicinity of the main academic building, cafeteria and students centre. The chosen informal learning is approximately 50 to 100 meters square and within the range of 50 to 80 meters from library and café. Furthermore, the selected social setting has a higher level of social interaction among students, a variety of activities: conversing, studying, observing and wandering, and the nature of their assignments promotes informal and collaborative learning (Nassar & El-samaty, 2014). Table 1 shows the list of transition space.

A qualitative method, particularly observation and interview were occupied in order to obtain a richer and more in-depth understanding of learners social behaviour in informal learning setting (K. E. Matthews et al., 2011). Whereby, supported with observational and semi-structured interview sheet, a digital camera and campus layout plan (Norhani Ibrahim et al., 2013). The observation centralize on three type of transitional spaces (Liang, 2013). Namely, 1) transition space between two destinations: internal corridors; 2) transition space between exterior and interior: courtyard; and 3) transition space between natural and buildings: Gazebo. Meanwhile the observation and focus group discussion are focused on space independent and dependent utilization activities by students which based on environment behaviour setting model (P Schoggen, Price, & Fox, 1990). The data collection conducted for three weeks during a typical study session which covers weekdays. For this purpose, walkthrough method was applied during observation (Abd-Razak, Utaberta, & Handryant, 2012; Norhani Ibrahim et al., 2013). During each walkthrough session, it takes approximately 1 hour and its based on the learners' class timetable (Elizabeth, 2015). In fact, most of the transitional spaces will be occupied by learners during break time. The observation and semi-structured interview were carried out by researcher on observation forms developed based on environment-behavior interaction characteristics by Gary, (1979). Hence, the observations were executed within three session- between 8:00am to 12:00pm, 12:00pm to 5:00pm and 5:00pm to 7:00pm. They were done at random time on weekdays.

Following the advent of the researcher in the transition spaces, common observations were recorded and documented for relatively 15 minutes. Subsequently, the observation focus on a distinct group of students or an individual student present at the transition space for 10 minutes. In particular, some behavioural were distinguished, such as what he/she/they were doing, activities, location, types of staff-student synergy, mood, reactions to the environment, group structure and interesting events among them during that time. Finally, the student(s) were interviewed in an informal manner. The informal interview is conducted by guided core questions in order to be deductive and non-directive to extract more open possible answers from unstructured interviewees. By applying a non-directive mode, the interview session can be more natural and less bias (K. E. Matthews et al., 2011).

However, more insightful questions were applied to amplify clarify responses. The interview executed from 10 to 15 minutes only in order to obtained decisive responses. All responses from the respondent(s) were recorded via note-taking during and after the interview. Indeed, since the main objective of his research was to sustain a naturalistic feel and to prevent negligently inhibiting answers, therefore, audio-recording is not applied (Patton, 2002). Subsequently, reflective notes were obtained.

TABLE 1 LIST OF TRANSITION SPACE IN UNGKU OMAR POLYTECHNIC

Between two destinations	Between exterior and interior	Between natural and buildings
		
Internal corridors	courtyard	Gazebo

Source:Author

This research will investigate three types of transition spaces in higher education that were commonly used as informal learning space by learners. Particularized transition space from each designated classification, (1) transition between two destinations: internal corridors; (2) transitions between exterior and interior: courtyard; and (3) transition between natural and buildings: Gazebo (refer table 1), will be elucidated and analysed based on four behaviour setting components: space, object, behaviour, and time. Designated transitional spaces are chosen on a random selection because one of the behaviour setting's attribute is cohesion. Therefore, although the users and minor props may be divergent, the pattern of the behaviour and the correlation of the setting kept the same(Moore, 1979)

4. Results of analysis

As mentioned by Cleveland and Fisher, the space utilization is regarding measurement of the usefulness of space and how space is utilized (Cleveland & Fisher, 2014). Nevertheless, learning environment researchers are more focus on physical learning environments and the rest more to psychosocial environments (Aldridge, Fraser, Bell, & Dorman, 2012). Based on the analysis, space utilization can be detached into independent utilization (iU) and dependent utilization(dU) (Preiser, 2016). Independent or self-utilization is the activities that associated precisely with the distinct transition spaces itself and its elements, over few tasks organized in the space. Meanwhile, dependent utilization is related

indirectly to the transition space which related to the surrounding function outside the space (Nassar & El-samaty, 2014). Apparently, in most circumstances, these two types of utilization will occur in same transitional space. In other words, all activities that occurred there can be classified based on the type of utilization. Table 2 describes the main and dominant utilization types more explicitly so that authentic scheduling of the relationship between learner's activities and utilization types can be performed. Therefore, by focusing on this relationship, list of informal learning spaces attributes and variables can be developed in order to obtained learners perception and preferences (Greenhow & Lewin, 2016). Hence, that facts are paramount in order to design an ideal and compatible new generation learning space towards education 4.0 (Byers, 2015; Harrop & Turpin, 2013; Schuster et al., 2016).

Fig. 2. Ungku Omar Polytechnic campus plan and the chosen location
Source: Adapted from Google Earth.

Based on the Gehl's classification of outdoor activities (Gehl, 1987), space utilization can be simplified and divided into three categories: (1) Necessary activities; (2) Optional activities; (3) Social activities. Furthermore, these patterns will be modified to fit the interior environment and to matching what was observed in the transition space. Necessary activities refer to those activities that very much compulsory, such as attending a lecture and used as a transition space. When we look at the time frame, these activities occur throughout the day under all circumstances and the learners have no option. This category of activities refers to dependent utilization (Usama, 2016). Secondly, optional activities are associated with the optionality of the participants. If the participants feel free to execute those activities and if the time and place factors are available, such as watching, sitting or taking a short break. These activities only possible to executed when specific conditions are most favourable. This group of activities are mostly interconnected with independent

utilization (UK Higher Space Management Group, 2006). Lastly, the third pattern is named as social activities which depend on the existence of others in public space. These activities happen as a direct consequence of people for examples greeting, conversations and gathering, related to both dependant and independent utilization (Therakomen & A, 2001). Basically, analysis of transitional space utilization is constructed based on behaviour setting components. Whereby, the setting is embraced with one or more coherent standing patterns of behaviour (Heft, Hoch, Edmunds, & Weeks, 2014).

A standing pattern of behaviour is another behaviour unit. It is a bounded pattern in the behaviour(Francovich, 2008). Examples in higher education transitional spaces, several standing patterns of behaviour occur such as an education exhibition, students' presentation, gathering and an open interview. A standing pattern of behaviour is not a common behaviour element among disparate behaviour elements and it has distinctive characteristics that remain when the candidate change (Hall, Green, Street, & Hall, 2012; P Schoggen et al., 1990; Phil Schoggen, 1989). Therefore, based on the analysis of the transition space utilisation, some facts can be culminated: (1) character of the activities and events occurring in transition space are harmonizes with the conception of standing pattern of behaviour setting; (2) every transitional space carries more than one event and condition of standing pattern of behaviour; (3) this composite of standing pattern of behaviour initiate an integrated of behaviour that distinguishes the setting; (4) list of standing pattern observed serve a significant recommendation to developed an ideal blueprint for next generation informal learning space.

TABLE 2: LIST OF TRANSITION SPACES UTILIZATION, ATTRIBUTES, AND PATTERNS OF LEARNER'S ACTIVITIES

Dependent utilization(dU) / Independent Utilization(iU)	Necessary/Optional/ Social	Standing pattern of behaviour (SP)
transition (dU1)	(N)	Passing, wandering and moving (SP1)
Accessing and exiting (dU2)	(N)	Interning and moving out (SP2)
Waiting (dU3)	(O)	Seating, talking and gathering (SP3)
Non-formal activities (dU4)	(O) + (S)	Club meeting (SP4)
Resting (dU5)	(O)	Seating, nap, and eating (SP5)
Announcing (dU6)	(N)+(O)	Standing and gathering (SP6)
Browsing (dU7)	(O)	Seating, chatting, and discussion (SP7)
Short break (dU8)	(O)+(S)	Nap, chatting, waiting, and talking (SP8)
Coursework (dU9)	(N)+(O)	Editing, assignment, and corrections (SP9)
Gathering (iU1)	(O)	Sitting and conversation (SP10)
Studying (iU2)	(N)+(O)	Sitting and dealing with IT services (SP11)
Exhibition (iU4)	(O)+(S)	Gathering information and observation (SP12)
Presentation (iU5)	(O)	Observations, talking and gathering (SP13)
Refreshment (iU6)	(S)+(O)	Chatting, eating and relaxing (SP14)
Conversations (iU7)	(S)+(O)	Chatting, discussion and gathering (SP15)
Celebration (iU8)	(S)+(O)	Meeting and gathering (SP16)
Meeting (iU9)	(S)+(O)	Face to face discussion (SP17)
Laying (iU11)	(O)	Relaxing and taking power nap (SP18)
Discussing (iU12)	(S)+(O)	Meeting among leaners' and lecturer (SP19)
Playing games (iU13)	(S)+(O)	Grouping with friends, handling IT devices, and online activities SP20

Source: Author

5. Conclusions

In conclusion, this research recommended transition space between two destinations as a space that promoting learning in higher education. This suggestion is supported by the variety of standing pattern of behaviour occur at the transition space between two destinations and the total maximum space utilization on learner's activities (figure 3) compared to transition space between natural and building, and between exterior and interior. This circumstance happened due to the conducive situation which promotes learning. Furthermore, this transition space between two destinations space has covered roof, adequate natural and artificial ventilation, sufficient luminance, electrical power point and furniture likewise those two with the uncovered roof that makes it received direct solar radiation during the day. Therefore, a further study on learner's perceptions and

preferences towards transitional space as an informal learning in higher education is required. Such study will contribute knowledge in this learning environment area and formulating an ideal next generation learning space towards education 4.0.

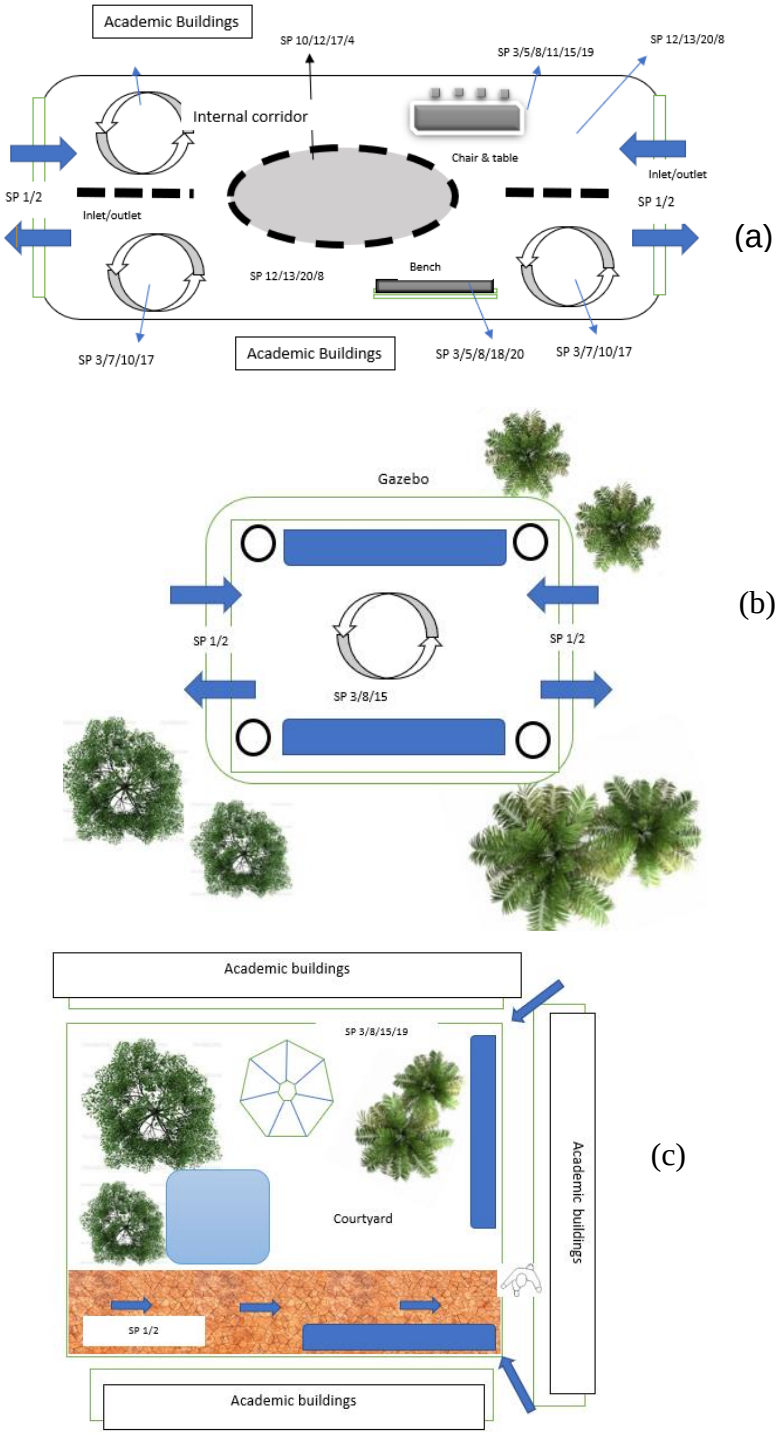


Fig. 3: Graphical plan of standing patterns of behavior in (a) transition space between two destinations, (b) between natural and buildings, and (c) between exterior and interior

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