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EVALUATING THE AFFORDANCES OF TRANSITIONAL SPACE AS SOCIAL LEARNING SPACE AT POLYTECHNIC

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Abstract

Presently, the vast evolution affiliated with academia in Malaysia encounter the expository needs of advance perspectives of new learning theory so-called as a connectivism learning theory for the digital age. Consequently, the entire conceptualisation of new learning space that designated as social academic learning space derived from this new learning theory. For this reason, there is a requisite to explore the actualisation of affordances of student social learning space (SLS) apart from conventional lesson time on campus. Accordingly, this research elicits an evaluation of the actualised affordance of the SLS associated with the behavioural of learners. This study analysed the physical attributes of the SLS and the architecture of the learning environments which immeasurably impacted the behavioural responses of the learners. Eighty full-time students form Ungku Omar Polytechnic were interviewed and observed to obtain the learners' behavioural responses, space utilisation and learners' perceptions towards SLS. The responses were analysed using content analysis and grouped into:(i) type of activities, (ii) actualized affordances, and (iii) reveals notes. Results from this research recommended that transitional space that labelled as transitions between two destinations is effectively perceived by learners as efficient and conducive SLS.

Keywords: Social learning space, affordances, new learning theory, connectivism, theory of affordances.

1. Introduction

In the past two decades, a worldwide outlook on the higher education storyline so-called as an academic revolution is substantially unprecedented. On top of that, the expeditious evolution of Information technology encounters the designation of Industrial Revolution 4.0 currently. In such a way, the emerging of new learning theory "Connectivism" has impacted the teaching and learning methodology in higher education conspicuously labelled as Education Revolution 4.0 (Polak, 2016; Wallner & Wagner, 2016). For this reason, the next generation learning group which revealed as the "first generation of digital natives'(Quinnell, 2015) desire to explore learning experiences in an active learning habitat which proclaimed as "Next Generation Immersive Learning Environments" (Fisher & Newton, 2014; Gautam, Williams, Terry, Robinson, & Newbill, 2018; Watkins, 2017).

Marmot (2012) clearly explained that there is a provocation on how learners perceived the new learning space which operates the pedagogical transformation. As a matter of fact, the entire university campus can be reconceptualised into new learning landscape. Thereby, an explicit learning space alignment model is required to elucidate spatial implication of a new way of educating. Pointed out in the literature, the current direction in designing a contemporary educational building, consideration is given more to social learning space, self-study, and collaborative learning settings compared to formal learning space (Beckers, 2016; Waldock, Rowlett, Cornock, Robinson, & Bartholomew, 2017; Wall, 2016) Furthermore, this expansion towards advances learning centre is clearly claimed in the guide of 21st century learning space design (JISC, 2006). In order to bridge the gap, a "purpose-process-place" framework for education was developed by Beckers and Voordt (2013) to evaluate the spatial implication of Dutch higher education learning institutions (Duffy, Craig, & Gillen, 2011).

The central reason for developing this idea is to distinguish the relationship between learning space and teaching process (Duffy et al., 2011; Thomas, 2015). Based on the purpose-process-place framework, purpose referring to the learning theories that have been used since the era without ICT facilities such as behaviourism, cognitivism, social constructivism, and connectivism until where the learning is not possible without ICT facilities (Figure 1). For this reason, the entire idea of learning turned from a place that delivers instruction way back in the 19th century into a setting that constitutes knowledge (Barr & Tagg, 1995). However, every learning theories mentioned above has its uniqueness and potential impacts on learners and educators. In relation to this, the conventional classroom design is significantly associated with the concept of "one-size-fits-all' regardless of learners' aspiration and preferences (Venkatesh, Brown, & Hoehle, 2012). In addressing this limitation, the new way of learning demands additional space so-called social learning setting (Ciolacu, Tehrani, Beer, & Popp, 2017). As a result, this paper focuses on analysing the actualisation of the affordance and learners' behavioural responses towards the SLS in Polytechnic Malaysia. Basically, this analysis is to determine the spatial implications of new ways of learning and the association between social learning setting and teaching and learning operations.
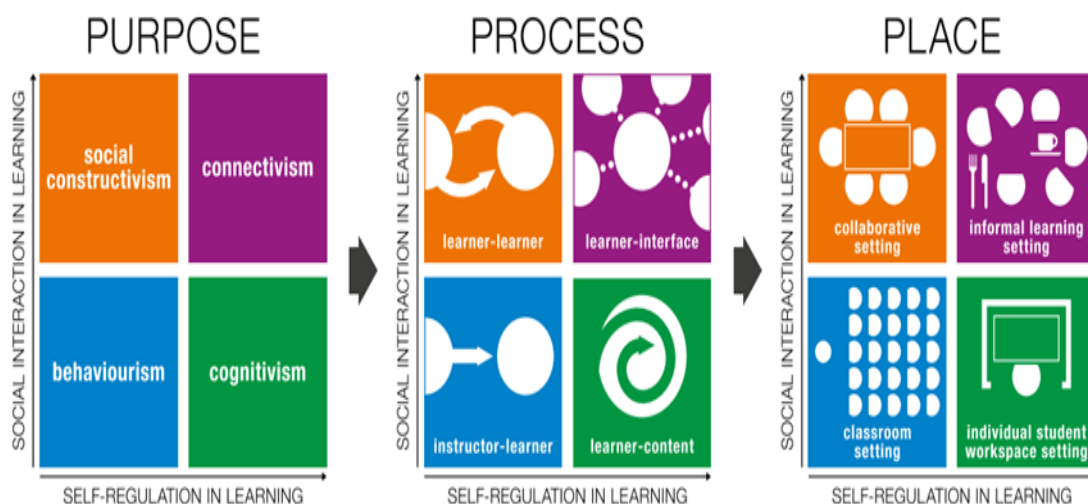
Figure 01. Purpose-process-place framework for education. Source: (Beckers, 2016)

1.1. Theory of affordance

This research employed Gibson (1979), the theory of affordances to understand the exploitation of the social learning setting and students' behavioural responses during their learning undertaking. In addition, this study permits the researcher to magnifying across social learning milieu via learner's perspective and to accomplished substantial evidence regarding actualised affordances (Aziz, 2014; Aziz & Said, 2015). Theory of affordance elucidate the relationship between functional attributes of the context and also clarify how the learning ecology have been utilised. Based on the Gibson theory of affordances, affordances refers to "what is offers the animal, what it provides or furnishes, either for good or ill" (Gibson, 1979). In short, affordances can be classified as positive and negative affordance (Quinnell, 2015), that are perceived through the actions and the perception of individual affordances (Gibson, 1979; Hamel, 2016; Heft, 2013). Positive affordance mentioning the potential benefits for learners while negative affordance is potentially harmful (Maier, Fadel, & Battisto, 2009). In simple, divergent learning ecology retains divergent affordances (Hamel, 2016).

Based on Figure 2, the environment is denoting to the comprehensive social learning milieu which scattered all over the campus (Beckers, 2016; Beckers, Van Der Voordt, & Dewulf, 2016) and consisted of four elements namely: observer, environment, object, and complementary relations. Meanwhile, the objects indicate anything from a physical future up to sounds, smells, lighting, and landscape in the settings. When the observer (students') distinguished the complementary relations with the object, an actualised affordance was acknowledged and the behaviour of studying could be accomplished (Aziz, 2014; Quinnell, 2015). In this study, affordances are the functionally significant attributes of the SLS that operationalised by learners' as most favourable, suitable, and conducive SLS. Commonly, affordances also labelled as "potentials for action" which divided into two different levels: potential affordances and actualised affordances.

In this study, there are three levels of actualised affordance occurred at the learning setting namely: (1) perceived affordance, (2) utilised affordance, and (3) shaped affordance (Aziz, 2014; Aziz & Said, 2015; Lehrig, Krancher, & Dibbern, 2017; Quinnell, 2015). Basically, perceived affordances denoting to what learners distinguish during observation of the learning environs and the learners define

those usabilities and functionality of the environment features and attributes. Meanwhile, the utilised affordance refers to all the possible opportunities that can be operationalised by learners and can be accomplished via direct interaction with the environment. Finally, the shaped affordance indicating the manipulating the environment setting features and attributes either in terms of functionality or forms. Those statement indicating how learners rearranging tables and chairs to fulfil their learning needs.
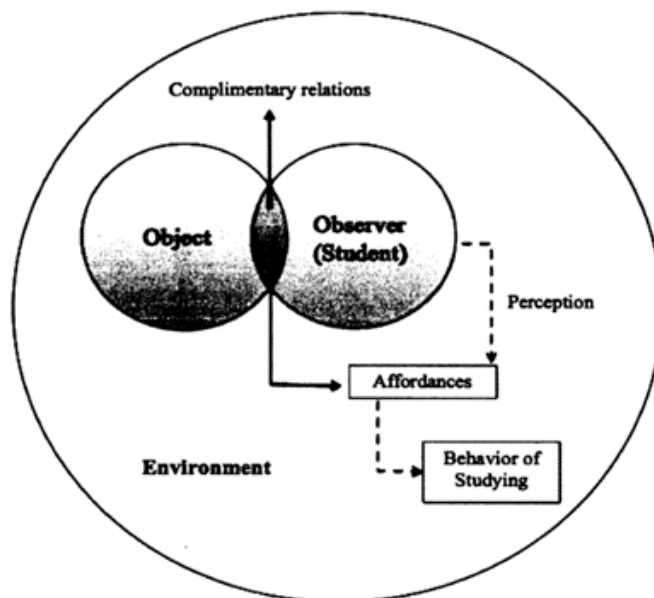

Figure 02. Theory of affordance. Adapted from A. Zaitchik's original image. Source: (Quinnell, 2015)

2. Problem Statement

Considering this, a compatible and fit learning atmosphere which considering all prominent aspects begin to be a prime issue that cogitates among members of academia around the world (Ibrahim, Fadzil, & Saruwono, 2013; Nenonen, 2015). Accordingly, some spatial alignment and assessment on existing learning setting are crucial to in-line with the 21st century education transformation and education 4.0 (Cox, 2017). To be very specific, existing learning theories that are exploited in higher education system designated as behaviourism, cognitivism, and social constructivism are assorted as conventional learning theories which occurred during the deficiency of technologies in teaching and learning. Undoubtedly, the advancement of technologies in education, accepting a new outlook on teaching and developing a present-day way of acquisition knowledge (Beckers, 2016; Ellis & Goodyear, 2016; Oliveira, 2016). In sum, learners' not only gaining knowledge from peers but learning from other ICT resources such as social media, digital or some virtual learning platforms. Thus, an adequate and compatible technology-enabled learning ambience is obligatory for learners which coined as "next generations learning space" (Byers, 2015; Hod, 2017; Leonard, Fitzgerald, Bacon, & Munnerley, 2017; Pates & Sumner, 2016).

3. Research Questions

This research evaluating the spatial implication of new learning setting based on the theory of affordances. Thus, the research question of this study related to:

- How did learners perceive the new learning space that named as social learning space?
- How are students educating themselves in a new way of learning undertaking?

4. Purpose of the Study

The purpose of the research is to understand the operationalisation of the social learning space and learners' behavioural responses during the learning activities in higher education. To be specific this research based on the student's perspective to gain some vital evidence on actualised affordances.

5. Research Methods

In this study, an in-depth exploration was carried out in the predetermined SLSs across the academic area of Ungku Omar Polytechnic (PUO) which excluding library and cafeteria. This study involved 80 full-time diploma students including technical: Geomatic, Civil Engineering, Architecture, and Quantity surveyor and non-technical course: Banking, Accountancy, and Islamic Banking. Meanwhile, qualitative methods, particularly non-participant observation, semi-structured interview and coordinate mapping were undertaken to explore the actualised affordances and the utilisation of the SLSs by PUO students (Creswell, 2014; Harrop & Turpin, 2013; Ibrahim et al., 2013). The study executed with the coordinate mapping method as a preliminary study (first phase). For this purpose, data collection was performed for four weeks that comprise days of the week. Participants were randomly chosen and required to accomplish the coordinate mapping data collection. To be specific, participants required to identify where do they carried out their informal learning works or planned to visit and mandatory to depict why they have elected that exact SLS (Harrop & Turpin, 2013). Coordinate mapping aims to identify the most positive affordance SLS and some evidence about informal learning spectrums. Furthermore, this preliminary data collection is to determine the precise social learning locations and obtained a rough idea where the interview and observation session (second phase) should be carried out.

However, the prerequisite to explore the learner's perceptions and preferences towards the physical elements of SLS led to the second phase. Therefore, non-participant observation and semi-structured interview methods were engaged to attain the research objective that to explore the learners environmental-behaviour responses, space operationalisation, and space usage; precisely, type of transitional spaces utilised, furniture, individual learning activities, collaborative learning activities, laptops usage, learning resources, refreshment, learning time, and electronic devices (Harrop & Turpin, 2013; Walton & Matthews, 2017). Concerning this, the data collection is assisted with few aids such as an observation sheet, semi-structured interview sheet, and a digital camera (Ibrahim et al., 2013). Walkthrough technique was employed throughout the observation sessions and each session consumed roughly 30 minutes (Ibrahim et al., 2013). The observation was executed within three sessions a day and it was conducted at random time on weekdays. Following the advent of the researcher at the SLSs, information from observation sessions is registered for moderately 15 minutes. This sampling strategy

amplifies to obtain vital evidence concerning students' learning behaviours, attitudes, types of affordances, and preferences in relation to where, what, when and how learners utilised the SLSs as new way of learning.

Finally, the learner(s) were interviewed informally. An ordinary interview session is directed via lead principal questions. To make sure the interview session more inherent, a student centered approach was applied. In this research, audio-recording is not applied due to sustaining a naturalistic feel of the students (Patton, 2015). In reality, during the pilot study, once interviewee(s) gets to know that their voice is getting recorded, he/she/they will be remaining silent and the entire interview session turned into disorder. For this reason, to avoid those circumstances, audio-recording is not conducted during interview sessions.

In this study, content analysis was employed to analyse qualitative data. The content analysis used to provide replicable and well-grounded inferences by coding the raw message systematically which is the textual materials and visual materials (Aziz, 2014; Mustapa, 2018; Patton, 2015). Based on the content analysis, all the student's behavioural responses attained from each type of social learning spot were coded into the type of activities. Later, those activities have been segmented into three themes: necessary, optimal, and social utilisation. Subsequently, those type of activities mentioned above segmented into two sub-themes: independent utilised affordances and dependently utilised affordances (refer Figure 3).
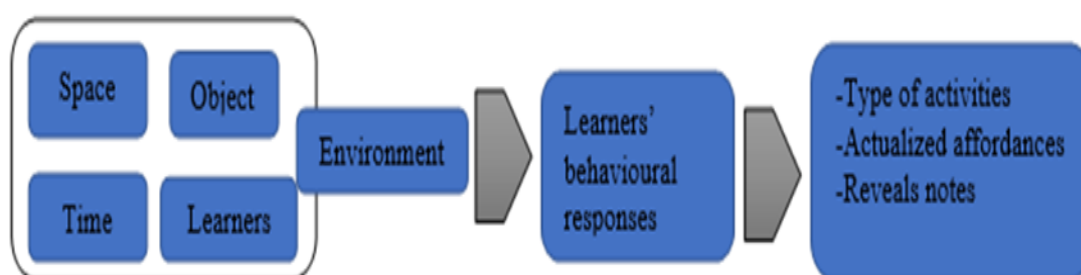

Figure 03. Learning space analysis process framework. Adapted from Affordance theory. Source: (Gibson, 1979)

6. Findings

Information from coordinate mapping pointed out students SLS on campus and provided some concise explanation of why they have chosen those locations. Actually, the crucial motive for performing this coordinate mapping is to identify the taxonomy of the SLS. As a result, learners identified several spots on campus namely: internal corridors, entrance lobbies, foyers, hallway, courtyard, external corridors, porch, gazebo, green space and square. Based on all the social learning locations mentioned above, it can be taxonomized as transitional spaces. Therefore, to make more significant and architecture, those SLSs can be sub-divided into three type taxonomy of transitional space (Liang, 2013), namely: (1) transition space between two destinations: internal corridors, foyer, and hallway; (2) transition space between exterior and interior: courtyard, external corridors, and terrace; and (3) transition space between natural and buildings: gazebo, square, and green space. Based on the results obtained above, the three

transitional spaces can be classified under the category of informal/social learning/multi-layered learning spaces in the typology of academic learning space as shown in Figure 4.
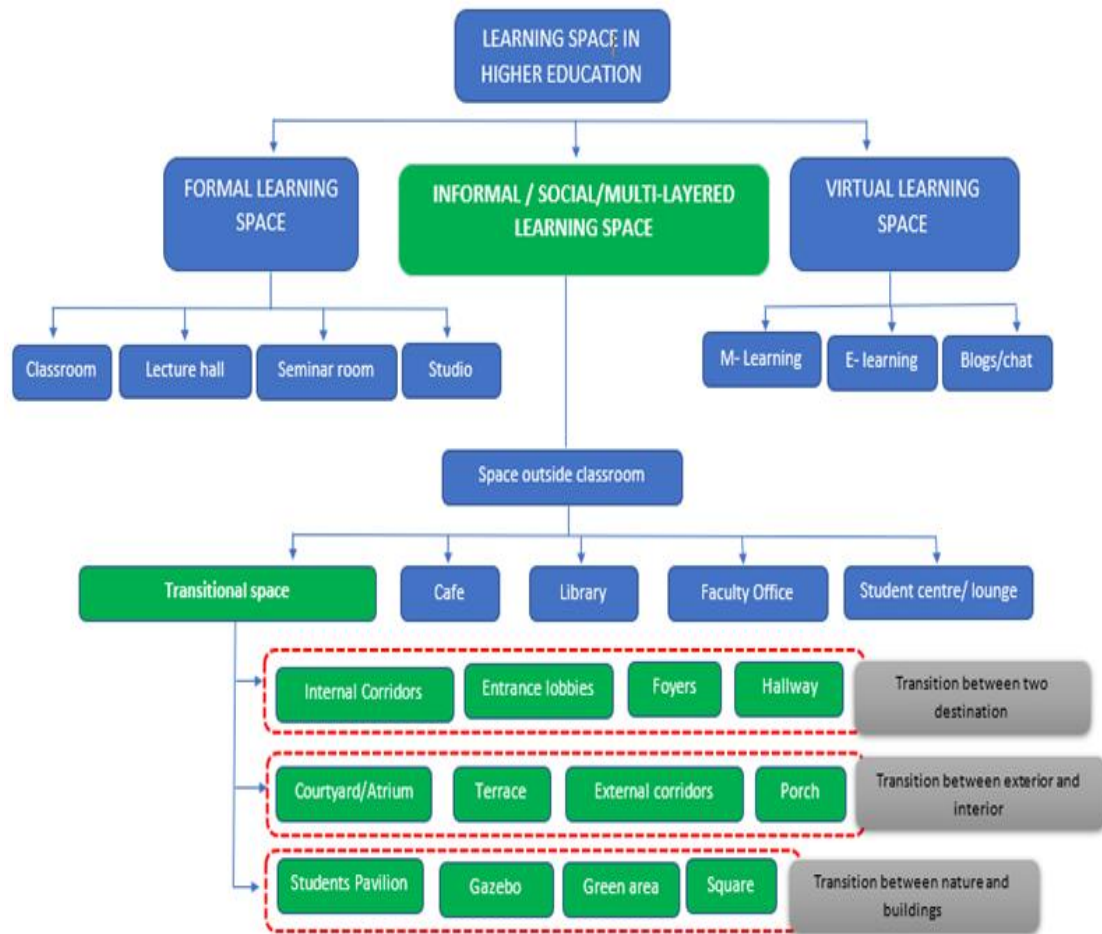

Figure 04. Typology of academic learning space. Source: (Author)

Table 1 shows the descriptions of SLS operationalisation and actualisation by learners. The facts that derived from qualitative data segmented into three groups namely: (i) type of activities, (ii) actualised affordances, and (iii) learners revealed notes (Yatiman, Aziz, & Said, 2012; Aziz, 2014; Aziz & Said, 2015; Quinnell, 2015). Grounded by Gehl's classification of outdoor activities (Gehl, 1987), learners' activities can be facilitated within three types of utilisation: (1) Necessary utilisation; (2) Optional utilisation; and (3) Social utilisation. In short, necessary utilisation referred to those students' activities that are compulsory and indispensable for learners' such as attending lectures and meeting lecturers. Secondly, optional utilisation is associated with the optionality of the learners in performing the activities. If the learners' feel free to execute those activities and if the time and ambience factors are available, such as watching video clips, sitting, chatting, studying, and taking a short break. Lastly, social utilisation depends on the existence of others in the setting. For example, greeting, conversations, gathering, and exhibition (Therakomen, 2001). In reality, some space utilisation has a combination of those three types of affordances.

As shown in Table 1, learners actively utilised the SLS that categorised as "transition between two destinations" compared to other transitional spaces. More concisely, "transitional space between two destinations" afforded 16 actualised affordances compared to "transitional space between exterior and

interior" which only afforded 9 actualised affordances, and "transitional space between nature and buildings" afforded 7 actualised affordances. Consequently, it is discovered that learners engaged actively in "transition between two destinations" space and those listed actualised affordances are such as: conversation, passing, napping, loungers, group discussing, presentation, eating, small meeting, replying emails, gathering spot, gaming, assignment, meal, resting charging laptops and handphones. Based on the observation and interview students revealed, "transition between two destinations" is encountered as multi-layered or multipurpose space by learners. In actual fact, students used this significant space for several purposes such as transit route, favourite meeting up spot, group discussion, group presentation and teaching and learning activities by lecturers. Moreover, learners demanded to have a very good wireless internet connection since ICT is one of the main domains in 21st century education which known as education 4.0. The actualised affordance can be sub-divided into two categories: (1) dependent actualised affordance, and (2) independent actualised affordance (Preiser, 2016). To be specific, self-actualised affordance is the activities that afforded with the distinct SLS and its surroundings. Similarly, dependent actualised affordance is greatly related indirectly to the SLS (Nassar & El-samaty, 2014).

Table 01. Descriptions of three types of transitional spaces, type of activities, actualised affordance, and revealed notes

Taxonomy of social learning space	Type of activities (Necessary/ Optional/ Social)	Actualised affordances	Revealed notes based on observations and interview
Internal corridor 1) Transition between two destinations	▪ walking across (N) ▪ communicate with peers when stopping by (N)+(S) ▪ take a short break and rest (O) ▪ seating while converse with the peer (N) + (S) ▪ playing the game on phones (O) ▪ check email while waiting for class (O) ▪ loungers with peers (S) ▪ taking a simple breakfast (N) ▪ charging laptop/handphone (N) +(O) ▪ small gather with lectures (S) + (O) ▪ the student will be doing the presentation on their work (N) ▪ collaborative studies (N) +(S) ▪ individual study (O) ▪ study along with peer (O) ▪ birthday or year-end gathering (S) **Total: 15 activities**	**Dependent actualized affordances:** Covering, passing, loungers, group discussing, taking the meal, wandering, small and ad-hoc meeting **Independent actualized affordance:** Student's presentation, laying on the beach (power nap), checking email and social media, waiting, watching clips and playing games with an electronic device, doing assignments, taking the meal, resting, charging laptops and handphones **Total: 16 utilized affordances**	▪ The space identified as the multipurpose setting. ▪ Learners utilized this space before shifting to the second spot. ▪ Gathering area during recess. ▪ Small group discussion and meeting. ▪ Lecturers will be performing teaching and learning activities. ▪ Covered space received less solar radiation, very small terrestrial heat, perfect natural ventilation and lighting. ▪ Students demanding for extra power plug points to charge electronic devices. ▪ Strong wireless internet connection spot is the core spot. ▪ During interview sessions learners revealed, 90% of them utilized their internet data. ▪ Students requested more water dispenser on campus and adequately maintained.

Courtyard 2) Transition between exterior and interior	▪ passing by (N) ▪ interaction with peers (N)+(S) ▪ short recess (O) ▪ transit (N) ▪ gaming (O) ▪ replying emails (O) ▪ spent time before back home (O) ▪ taking a meal (N) ▪ small group discussion (O) +(S) ▪ a meeting spot for peer (S) +(N) **Total: 11 activities**	**Dependent actualized affordances:** waiting, chatting spot, short break, **Independent actualized affordance:** meeting point, checking email, editing assignments, waiting and meeting spot, stop by before next class, lunch and breakfast venue **Total: 16 utilized affordances**	▪ less utilized space due to improper (ergonomically) furniture setting. ▪ the spot is very hot during the early afternoon due to uncovered and only utilized in the morning. ▪ less maintained of soft landscapes.
Square and Gazebo 3) Transition between nature and buildings	▪ take a short break and rest (O) ▪ gaming (O) ▪ replying emails (O) ▪ daily meeting spot (N) +(O) ▪ a spot to take the meal (N) ▪ small group discussion (O) +(S) ▪ a meeting spot for peer (S) +(N) ▪ birthday or year-end gathering (S) **Total: 9 activities**	**Dependent actualized affordances:** waiting area, chatting, playing games **Independent actualized affordance:** resting, checking email, small group discussions, taking the meal **Total: 7 utilized affordances**	▪ This space only utilized for social gathering activities compared to the academic meeting due to improper infrastructures such as electrical power point and furniture. ▪ The student mentioned that they preferred mind relaxing space. ▪ In PUO the gazebo is constructed near to the river, mosquitoes became the main issue for learners. ▪ Nature is the most significant attention restoration factors stated by students.

7. Conclusion

In summary, transitional space between two destinations is more suitable for learners to develop their cognitive and social performances in tertiary education. This recommendation is braced by the diversity of total maximum actualised affordances that afforded at the transition space. These affordances occurred because of the sufficient and favourable learning atmosphere which encourages informal learning undertakings. The development of ICT and mobile technologies has changed the method of learners' learning into a new way of learning. Moreover, electronic gadgets accomplish a dominant role in students' daily life activities. Concerning this, learners always connected to a place which afforded access to IT resources, technology-enabled space, appropriate furniture and power plug socket.

Furthermore, when the three transitional spaces were compared, only the transition between two destinations afforded a variety of affordances due to the properties of the context at the transitional space such as enclosed area, sufficient natural lighting, good ventilation, sufficient luminance, 3-point power plug, suitable furniture and good Wi-Fi coverage connection. Based on Figure 5, transition space between exterior and interior, and transition space between nature and buildings received direct solar radiation in the afternoon and evening. Only those space which surrounded with matures trees providing sufficient cooling effect which known as evapotranspiration process are utilised by learners. Moreover, during the

interview, learners revealed that they faced a very bad mosquitoes' problem at the gazebo which built-up near the river. This statement reflects the negative affordances of SLS which not suitable for any informal learning activities. Those transitional spaces which scattered around the campus, afforded in providing a positive affordance are recommended as a conducive and compatible SLS. In short, the learning built-environment blueprint has to be perceived in a holistic spectrum, considering the entire perspective of learning undertaking by learners and variability of learning milieu is paramount for learners to boost and enhance their learning experience. Moreover, every square foot on campus is a learning space. The new way of learning in the 21st century requires more freedom and accessibility of information not necessarily in the classroom. Ideally, learning can happen everywhere on campus, not just the classroom. The uniqueness of SLS is providing learners with availabilities to participate in individual learning and collaborative learning spontaneously at the same space. An ideal-designed learning built-environment permit learner with a better and abundant learning experience. Therefore, this research reveals that the semi-enclosed built-environment setting is most preferable by learners.

Acknowledgments

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