A STUDY ON LEARNERS' PERCEPTIVENESS OF TRANSITIONAL SPACES AS INFORMAL ACADEMIC LEARNING SPACE IN UNGKU OMAR POLYTECHNIC

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Abstract: Currently, the expansion of ICT changeover in teaching pedagogies highlights the critical need to change learning perspectives more towards collaborative and self-regulated learning. The impact of learning ambient turn more notable due to education revolution 4.0. Consequently, there are prerequisites establishing an ideal informal academic learning space that fosters 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 spaces, namely, semi-outdoor transitional spaces: courtyard, terrace, porch and external corridors. This study infuses case study research and quantitative data collection. Consequently, the research is based on a survey questionnaire that was participated by 300 diploma learners from diploma academic programmes in Ungku Omar Polytechnic. The paper provides insight for future evaluation of higher education informal learning spaces by analysing the relationships between the semi-outdoor informal academic learning space and the transitional space attributes. The finding reveals that interaction attributes contribute the highest prediction on learners' perception of semi-enclosed informal academic learning space followed by aesthetics, comfort, ICT facilities, semi-privacy, and privacy. Unfortunately, autonomy attributes do not predict learners' perceptions towards informal academic learning space. This study grants a profound insight centred upon learners' perspective on the spatial alignment of education 4.0 learning ecosystem can be configured to enhance collaborative and self-regulated learning activities by distinguishing the critical preference of informal academic learning space.

***Keywords**: Informal academic learning space, transitional spaces, learners-centered learning, semi-outdoor, informal learning*

1. Introduction

Learning occurs when a person communicates each other in an informal-milieu ambience. Higher education has lately turned into a profound prerequisite in societies via proficient scholars searching to expand net generation learning approaches, comprising informal learning approaches (Salih et al., 2021). Sourav & Afroz (2021) deliberated that tertiary education settings must address learners' various cultures. Social and academic desires. Multiple learning spaces must be incorporated on campus to attain learners' desired academic goals, including physical and virtual, formal and informal, outdoor, personal, and practice-based spaces (Salih et al., 2021; Sourav & Afroz, 2021). Ramu et al. (2020) stated that academic revolution is the interconnection of transformation and revolution, which has swayed most of the significant aspects in tertiary education worldwide. Consequently, an ultimate academic learning space has becomes a substantial topic and has been

crucially debated among scholars across the globe (Ibrahim et al., 2013). Tertiary education currently shifting from limitations seeing into the most compatible net-generation learning space amalgamated by formal, informal, and virtual learning environments (refer Figure 1)(Martin-gutierrez et al., 2017). Wilson & Cotgrave (2016) stated that diverse learning activities occur outside of class time than ever before. Hence, it is essential to explore the new emerging notion of informal learning space (ILS) to promote student engagement and informal learning experiences. Furthermore, ILS is one of the important component in online learning which need more research.

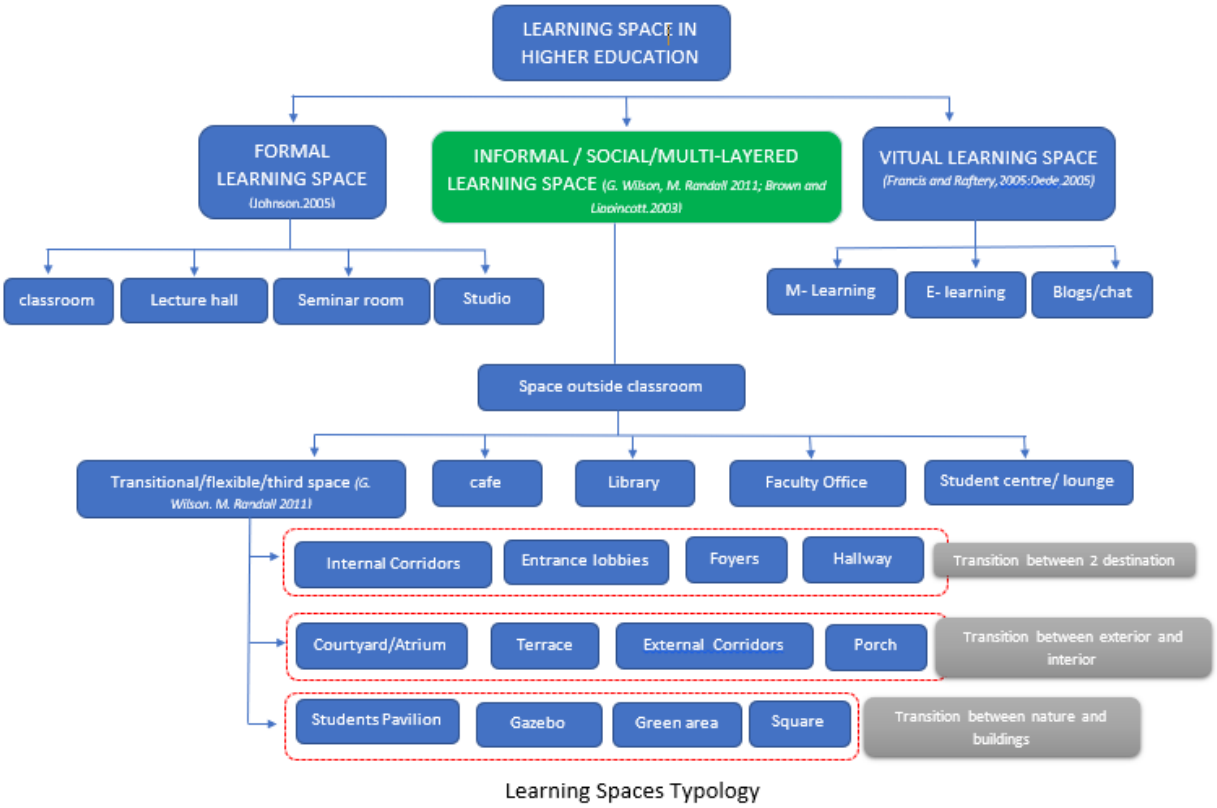

Figure 1: Typology of Academic Learning Space Source: Author

2. Literature Review

Informal learning is classified as a residual learning type that does not need a formally organised learning syllabus (Kumar & Bhatt, 2015). Meanwhile, Walton & Matthews (2018) defined informal learning as the results of incidental learning and taking place during leisure time. Harrop & Turpin (2013) state that new or redeveloped learning spaces with particular growth take place in what is termed “informal learning spaces”. Informal learning spaces are defined as non-discipline specific spaces utilised by both staff and learners for self-regulated learning undertakings. Niemi (2021) had acknowledged the prerequisite for research on learning spaces and the connectivity to learning. The essential to recognise why and how informal learning spaces can remain relevant is pressing, and achieving this can donate a response to the question: what makes successful higher education informal learning spaces? The informal learning spaces vary from the garden, square, cafeteria, internal and external corridor, gazebo, library, courtyard, and lobby. This study explores the learners' perceptions of the spaces mentioned above that are mainly used for informal learning activities. In this study, the

transitional spaces are segmented into three IALS, namely: i) semi-enclosed IALS: internal corridors, external lobbies, foyers and hallway; ii) semi-outdoor IALS: courtyard, atrium, terrace, external corridors and porch; and iii) outdoor IALS: gazebo, green space and square (Liang, 2013). As stated by Maheran et al. (2017) an outdoor learning space is considered an outdoor education facility that inspires educators, learners and teachers to gain better knowledge and offer substitutions to learn and understand the interconnectedness of the natural resources. In higher education institutions, this method is designated as an instrument that permits learners and lecturers to move their educational curriculum outdoors and experience the natural and physical-created elements in natural surroundings (Maheran et al., 2017). As revealed by Norhani Ibrahim et al. (2013) outdoor learning spaces provide opportunities to experience a "natural studies environment", as the physical environment positively impacts learners' learning possibilities and learning outcomes. Likewise, a good landscape campus situation is profound to enhance learners' physical and cognitive expansion and improve learning abilities (Matloob et al., 2014). Therefore, learners tend to spend their break time indoors rather than outdoors, as the outdoor spaces are not functionally designed to support their learning activities.

The previous planning of Malaysian University campuses is designed to accommodate formal teaching activities, such as lecture halls, air-conditioned classrooms, and laboratories, with the least consideration on integration with campus ground (Norhani Ibrahim et al., 2013). Research by Neda & Andrew (2021) also agreed that there is a lack of natural element settings from primary schools to the university level. Inconsiderate outdoor areas and pocket spaces for learners' learning led to distinct interaction between the quality of the outdoor environment and the quality of life on the campus. Currently, Malaysian campus planning is still based on conventional education practices, which disservice to the academic aspirations of 21st-century teaching institutions enriches learners' lives with exposure to the natural environment and emphasises the actual experience gained outside of the classroom. The arrangement of informal learning spaces in higher education institutions is vital to inspire learners to utilise the spaces vigorously and encounter learners changing study needs (Norhani Ibrahim et al., 2013). Hence, adequate informal learning spaces provide varying learning undertakings and promote technological accessibility to aid students' learning processes. According to Harun & Salamuddin (2013)connecting learners with outdoor informal learning space aid in developing a sense of belonging, developing social connections among peers, and enhancing personal skills performances, including positive self-concept. A study by Norhani Ibrahim et al., 2013 underline the advantages of the outdoor informal learning space in the learning ecosystem, which is (i) broadening educational performances, (ii) developing individual potential, (iii) motivating towards self-directed learning and also (iv) sharpening learners' intellectual ability and psychological development. Furthermore, studies by Maheran et al. (2018) acknowledges the component of outdoor spaces for active learning is according to the experiences and understanding of the connectivity between the architecture and landscape environment. Table 1 illustrates the three key features of an outdoor informal learning space for learners.

Table 1. Key features of design spaces. Source: (Maheran et al., 2017)

Key features of design spaces for active learning
1. Sense of belonging - The space that accommodates diverse students and the public - Maximize the use of daylighting to reduce energy use - Multipurpose spaces for varying learning activities - Comfortable spaces build a feeling of connection towards the environment
2. Flexibility and multi-use spaces - Movable furniture to incorporate multifunction activities - Highly flexible, self-contained and free distraction spaces - Increasing flexibility spaces for specific functions/multifunction activities - Design features that maximise user control
3. The uses of non-classroom spaces for learning - Design spaces to overcome function and services - Space availability merges social interaction - Usable transaction space between indoor and outdoor

The functional aspects of learner-centered learning are associated with active learning, deep learning, blended learning, learner's responsibility, and accountability and a sense of autonomy. As mentioned by Ibrahim et al. (2013) learner-centered learning indicates that students are required to spend a significant amount of their learning time outside-classroom to plan their learning activities. Based on the statement above, it is clearly stated that there is a need to evaluate the existing conditions of IALS. The emergence of ICT and new modern technology has influenced the learning space from traditional classrooms into various learning settings. In fact, there is an alteration in the principles of obtaining knowledge as well (Amit Kumar, 2015). Thus, learners enquire for a new and motivating learning space that is more flexible, efficient, smart, and integrated.

Mostly, IALS is widely spread around the campus and conveys several attributes, namely: (i) interaction, (ii) academic and non-academic discussion, and (iii) entertainment (Yun et al., 2016). Furthermore, IALS is also known as a social learning space or third space as well. Poutanen (2013) concluded that creating a third space on campuses results in a successful campus environment that encourages learners' satisfaction compared to home, informal off-campus, on-campus, and classroom study locations. IALS can be in the form of physical and virtual environments (Norhani Ibrahim et al., 2013). In short, IALS can be categorised as enclosed spaces, semi-enclosed spaces, semi-outdoor spaces and outdoor spaces. Kumar and Bhatt (2015) stated that IALS and libraries are among the predominant informal built environments. Chen et al. (2016) define IALS conferring to breakout space, outdoor learning space, group learning space and individual pod. Imperatively, the informal learning environment turned equally students-centred as the formal learning environment. Interestingly, vast academic activities have occurred in the informal learning space ever before (Nenonen, 2015). Concerning this, the query is the extent to which the existing higher learning institutions in Malaysia can accommodate and be compatible with this present-day educational trend. Presently, learners substitute transitional spaces as informal learning venues in higher learning institutions. Basically, learners will designate a space that fits learners affirmatively for informal learning activities.

3. Research Method

The focus population in this research is Ungku Omar Polytechnic students, which was established in 1969. In addressing this limitation, research needs to be executed in order to explore the learners informal academic learning space preferences attributes. This survey research involves (N=300) full-time diploma students who comprise technical and non-technical academic programmes. In detail, technical academic programme consist of diploma in Architecture, diploma in Electrical, diploma in Marine Engineering, and diploma in Mechanical Engineering. Meanwhile, non-technical academic programmes consists of diploma in commerce, diploma in Islamic Banking, diploma in accounting, and diploma in Marketing. The questionnaire that developed to acquire research data encompasses two parts- Part A and B. Part A involves questions associated with learners' demographics. Part B of the survey related to learner's preferences on social learning space entailing of seven constructs adapted from Beckers, van der Voordt, & Dewulf, (2016) The students were clustered based on semester and a consensus number of 100 students (4 semesters) were randomly selected from each polytechnic. In sum, a total of 300 students were selected. During the experts' review procedure, it has been suggested by the educational experts that the survey items have to be bilingual, which is in Bahasa Malaysia and English language.

The entire quantitative data collection is governed by the researcher personally. Indeed, this had the advantage that the researcher could collect the completed survey set in a short time and ensure an almost 100% response rate. In fact, by doing this, the researcher delivered the research topic and objective directly to the respondents and assisted them immediately if they had any queries regarding the topic (Sekaran & Bougie, 2016). In this case, the researcher read and explained the questionnaire clearly to confirm that the students clearly understood the survey set. The respondents took approximately 15 to 20 minutes to complete the survey. The pilot study was conducted on 30 students to ensure the instruments' appropriateness, wording, sequence, format and (Thien et al., 2014). A few problems arose during the second pilot test. Few items needed to be rephrased and deleted due to the ambiguities of the items. Respondents get confused with the 6- point Likert scale questionnaire and the estimated time to complete the survey exceeded 30 minutes. Finally, a set of dual-language version questionnaires with a 5-point Likert-type scale ranging from 1 (strongly disagree), 2 (disagree), 3 (not sure), 4 (agree), and 5 (strongly agree) was administered. The estimated time to complete the survey is between 20 to 25 minutes. Before the pilot test, the survey items were revised and submitted to three experts to evaluate the content validity. Construct validity was achieved after the pilot study by using factor analysis (Kaisen-Meyer-Olkin (KMO) value is 0.9, and Bartlett's test of sphericity is $p<0.01$). Meanwhile, the overall Cronbach's alpha for the instrument was 0.933. This study adopted the standard type of multiple regression to examine the relationship between the types of IALS and IALS preferences attributes.

4. Results of analysis

The results for tolerance and VIF are shown in Table 2 for the second model. Based on Table 2, for all independent variables, the tolerance value is more than 0.10, and the VIF value for all independent variables is less than 10. The results suggest that there is no multicollinearity problem in this regression model, and the model is appropriate. This also indicates that the independent variables are not measuring the same thing.

Table 2: Regression Coefficients (Model 1)

Model		Standardized Coefficients			Collinearity Statistics	
		Beta	t	Sig.	Tolerance	VIF
1	Constant	2.102	20.789	**.000**		
	Comfort (X_1)	.105	3.040	**.002**	.280	3.570
	ICT (X_2)	-.093	-5.070	**.000**	.412	2.429
	Layout (X_3)	.049	2.015	**.044**	.615	1.626
	Interaction (X_4)	.237	8.928	**.000**	.637	1.570
	Aesthetics (X_5)	.023	.897	.370	.485	2.060
	Autonomy (X_6)	-.004	-.243	.808	.622	1.607
	Privacy (X_7)	.036	2.245	**.025**	.654	1.529
	Semi-Privacy (X_8)	-.022	-1.226	.221	.447	2.237

Since all the preliminary analyses for multicollinearity, outliers, normality, linearity and homoscedasticity have met the assumptions. Therefore, the regression model is appropriate. As showed in Table 3, the model summary presents how much variance in the dependent variables (perceptions) is explained by the independent variables (IALS preferences attributes).

Table 3: Model 1 Summary

Model	R	R Square	Adjust R Square	Std. Error of the Estimate
1	.400[a]	.160	.153	.40032

a. Predictors: (Constant), Layout, Privacy, Autonomy, ICT, Interaction, Aesthetics, Semi Privacy, Comfort

Based on the Model 1 summary, as illustrated in Table 4, the coefficient determination for the developed model is .160 (R^2 =0.160). The coefficient determination (R^2) indicates the percentage of dependent variables that predicted the independent variables (Hair et al., 2014). Thus, the independent variables can explain 16.0% of learners' perceptions.

Table 4: Modal 1 ANOVA

Model		Sum of Square	df	Mean Square	F	Sig
1	Regression	32.574	8	4.072	25.408	.000[a]
	Residual	171.477	1070	.160		
	Total	204.051	1078			

a. Predictors: (Constant), Layout, Privacy, Autonomy, ICT, Interaction, Aesthetics, Semi-Privacy, Comfort

Next, the ANOVA table as shown in Table 4.0 was used to assess the statistical results. The model has a significant level of 0.00 ($p<0.001$). Therefore, this model is appropriate to predict learners' perception towards IALS. Table 2.0 can be referred in order to determine which independent variables predicted learners' perceptions towards IALS. Based on the Figure 2, five attributes predicted the learners' perception towards semi-outdoor IALS: comfort $p<0.05$ (ß=-0.105, t=3.04, Sig. 0.00); ICT facilities $p<0.05$ (ß=-0.093, t=-5.07, Sig. 0.00); Interaction $p<0.05$ (ß=0.237, t=8.92, Sig. 0.00); Layout $p<0.05$ (ß=0.049, t=2.01, Sig, 0.04); and Privacy $p<0.05$ (ß=0.36, t=2.24, Sig. 0.02). Meanwhile, semi-privacy, aesthetic and autonomy attributes are not statistically significant in making contribution to learners' perception towards semi-outdoor IALS: Semi-Privacy $p>0.05$ (ß=-0.022, t=-1.22, Sig. 0.22); aesthetic $p>0.05$ (ß=-0.023, t=-0.89, Sig. 0.37); and autonomy $p> 0.05$ (ß=-0.004, t=-0.24, Sig. 0.80).

$$Y = 2.102 + 0.105(X_1) – 0.093(X_2) + 0.049(X_3) + 0.237(X_4) + 0.036(X_7)$$

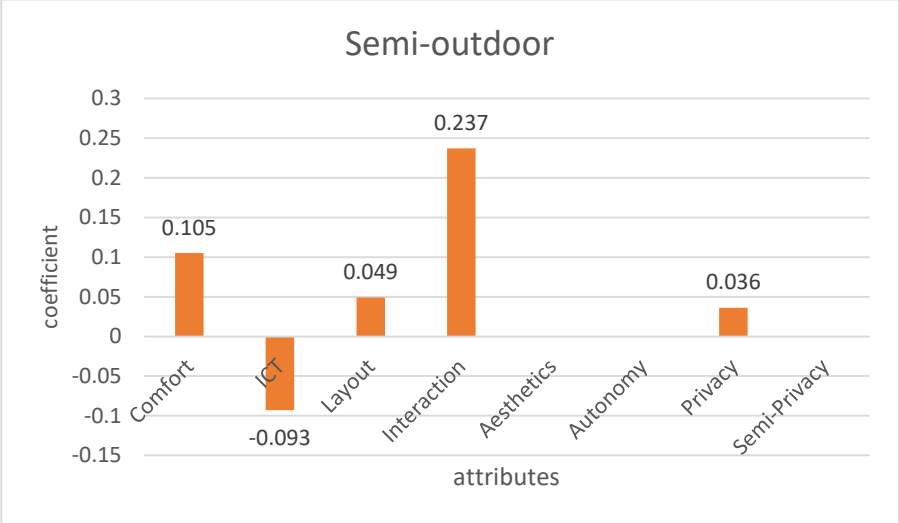

Figure 2: Coefficients of conditions for interpreting semi-outdoor IALS *(Adjusted R square = 0.160)*

5. Conclusions

The findings designated that interaction attributes make the most substantial contribution to learners' perception of semi-outdoor IALS (β=.237). Undoubtedly, learners use IALSs for collaborative learning, group work, meeting up-points, and gathering venues that enhance interaction and collaboration accomplishments. Consequently, the net-generation learning space has to be interactive, flexible and a technology-rich teaching setting. This study also indicated that privacy attribute contributes to predicting learners' perception on semi-outdoor IALS (β=.036). Privacy attribute refers to a space that can provide concentration and retreat. This study revealed that learners prefer semi-outdoor IALS as a space for privacy purposes. A space that provides more privacy and personal space and is not shared by both genders. This study's findings indicated that comfort attributes have a significant positive influence on learners' perception of semi-outdoor IALS (β= .105). Comfort attributes refer to a thermally comfortable space, shaded space, moveable tables and chairs, good ventilation with fresh air, and space utilised 24 hours for collaborative and individual learning.

Walton and Matthews (2018) mentioned that the rapid development of ICT is one of the many that influence how higher education is delivered. However, the finding indicated that ICT facilities negatively correlate with semi-outdoor IALS (β=-.93). ICT facilities are attributed to printing service availability, 3-pin electrical power point, quick online access and strong wireless network. The previous study by Nenonen et al. (2015) revealed that learners have their own culture, so-called Bring Your Own Device (BYOD). BYOD refers to the use of personal smartphones and devices on a university network (Walton and Matthews, 2018). The BYOD culture is possible with the latest mobile socio-digital technology, and advanced insight on blended learning make the BYOD culture possible. As stated by Nenonen et al. (2015) the use of own device (BYOD) encourages the use of personal digital tools. Moreover, this method makes a less ICT-heavy environment possible, whereas the concentration in promoting collaboration and learning is mediated by the best and most appropriate digital technology potential. Studies by Beckers (2016) indicated that layout significantly correlates with learning space preferences. For the same reason, the current study found a significant correlation between semi-outdoor IALS with the layout. Layout refers to a spatial arrangement that permits collaborative and individual learning with proper furniture setting, space that allows food and beverage, and as a small pit stop venue. Moreover, the semi-outdoor IALS's permit small gatherings among learners, collaborative learning activities, self-regulated learning, and more freedom. Sommerville and Collins (2008) discovered that learners favour open, unconfined learning spaces. According to Jamieson (2016) layout, comfort, and aesthetics are profound elements of the learning environment that should meet learners' individual requirements.

In this study semi-outdoor IALS does not show any correlation with aesthetic attributes. Aesthetics in the context of informal learning refers to an attractive space with a natural environment such as soft and hard landscapes and proper floor finishing and wall decoration that allows for learning to take place, yet in an informal way. In the future, more research needs to be done on outdoor IALS associated with natural futures. Many studies have emphasised the impact of physical aspects of IALS that influences learning and teaching, in particular, aesthetics (Yang et al., 2013). In fact, in a diary logbook study, he further elaborated that learners prescribed aesthetics attribute as one reason for choosing specific learning spaces (Beckers 2016). Nevertheless, autonomy is the only attribute that does not contribute to learners' perception. In this study context, autonomy refers to a homely environment, a small corner for a power nap, and a private space for learners-lecturer discussion. In contrast with Beckers (2016), the finding mentioned that autonomy significantly influences IALS preferences, nevertheless, to a certain extent. Autonomy is more associated with self-regulated learning, which occurs at home.

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