A Study On Learner's Satisfaction Towards Informal Learning Space in Higher Education Institutions

V.Ramu[1], Naeemah Yusof [1*] and Mazarina Md Zain [1]

[1] *Politeknik Sultan Idris Shah (PSIS), Sungai Lang, 45100, Sabak Bernam, Selangor, Malaysia*

ABSTRACT

The purpose of this paper is to impart exploratory research of the learners' satisfaction operationalisation of informal learning spaces (ILS) for their non-face to face based on the students learning time at higher education institutions. Most of the studies have predominantly emphasised the face-to-face learning space: libraries, classrooms, and lecture theatres. Nevertheless, there is a captivating identification of the significant importance of informal academic learning space, namely the transitional space: internal corridors, external lobbies, foyers, hallway, courtyard, atrium, terrace, external corridors, porch, gazebo, student pavilion, green space, and square. Questionnaires survey were the origin of empirical data for the research. The study methodology explicitly discovered in what way learners perceived the informal academic learning space. This study grants a profound insight centred on the learner's perspective on the spatial alignment of the education 4.0 learning ecosystem that can be configured to enhance collaborative and self-regulated learning activities by distinguishing the critical preference of informal academic learning space.

INTRODUCTION

In exploring the forthcoming education transformation, the Industrial Revolution (IR) 4.0 became the foremost attribute in the education shifts globally. Doubtless, IR 4.0 influenced various disciplines, particularly in teaching and learning method [1]. Moreover, the vast development of Information, Communication, and Technology (ICT) formulate education 4.0 [1–3]. In truth, "traditional education" manage learners' as a factory assembly line. Hence, it has failed to embrace IR 4.0 in terms of employee capabilities, abilities and propensity [4]. Therefore, a study on spatial alignment is required to fulfil the pedagogical shift. In fact, the effectiveness of existing physical learning setting today in higher education need to explored [6].

Informal learning is classified as a residual type of learning which does not need a formally organized learning syllabus. Jamieson 2013, stated that informal learning is "a student-driven course or programmed based study which occurs outside the classroom with no direct teacher involvement". As noticed, the informal learning activities that happen all over the university campus take place in multiple locations. Thus, the purpose of this paper is to explore the multiple informal academic learning space typology in the context of Polytechnic Malaysia, and learner's satisfaction and the relationship with the academic program. The venue may be a garden, square, cafeteria, internal and external corridor, gazebo, library, courtyard, and lobby. Norhati Ibrahim &Fadzil [8] mentioned that student-centric learning shows learners must manage their own learning activities known as self-regulated learning. Hence, it is clearly stated that there is a need to evaluate the existing conditions of ILS utilized by learners to manage their informal learning activities.

Currently, higher education moving into the essential prerequisite and compatibility of next-generation learning space whereby nexus by formal, informal and virtual learning environment. Studiesrevealed that "there is a growing awareness that learning happens all over the campus, not just in classrooms and labs". This point of view directs that learners' learning operation can occur anytime, anyhow and anywhere. For this reason, it is uppermost to address a new emerging concept of ILS. As stated by Dole et al. [30] and Kumar & Bhatt [31], ILS is more promoting students' engagement, learning experiences, and collaborative activities. Thus, learners' favourable learning space turn into a crucial issue globally [6-7]. This study provides excellent insight into the usefulness of ILS, which is very significant for the digital native learners explicitly. Several past research shows that proper and adequate ILS positively impacts learners' learning objective and outcomes [8-9]. Hence, the current study explores the learner's satisfaction towards the exiting ILS setting on campus ground in higher education, specifically Polytechnics Malaysia.

LITERATURE REVIEW

As reviewed in the literature, learners' informal learning happens at all stages in the learning process on campus and off-campus. Moreover, the ILS nature is more towards non administered by the learning institutions. However, the entire ILS is operationalized by the learners. Learners take charged of the layout setting and configuration of the space, which is more exploratory and self-directed [10]. Matthews et al., 2011 mentioned, there is a significant correlation between the level of learners engagement and ILS utilization compared to the non-users. Hence, those who are exploring the ILS can perform much better in academic [7]. Apart from formal learning, the interrogation of how learners perceive and operationalize the ILS becomes a topic of current interest, particularly in the age of modern learning technologies [12-13]. Imperatively, the conception of the third space is very significant in improving learners' engagement on campus, whereby, can enhance learners concentration independently and collaborative learning as well. Campus space planning missing an inadequate interpretation of ILS, which operationalization by learners. Helpful insight and documentation are required in order to redesign and co-create an ideal learning ecosystem for the digital native learners [7], [14-16]. Consequently, this concern has initiated some studies on ILS assessment [11].

In this era of education 4.0, massive learning activities accorded an out-of-classroom learning timetable than ever before [12-13]. Thus, it emphasizes the significance of the ILS among learners during their daily learning routine on campus. Currently, higher education learners are utilizing transitional spaces such as foyers, internal corridors, hallway, external corridors, gazebo, pavilion, terrace and square as their ILS in handling their informal learning accomplishments [17]. Therefore, this scenario urges researchers and academicians worldwide to explore the importance of ILS in 21st-century education [12].Due to the advancement of ICT in 21st-century education, teaching and learning undergo an immense transformation. In the present-day, learners' learning prerequisite, behaviour, and attitude have altered and learning institution captivating efforts to accomplishing all those needs. Instead of relaxing and gathering, informal spaces have changed into a collaborative and self-regulated learning space known as ILS [23]. Currently, learners began exploiting the formal and informal spaces for educating activities. ILS has remained unexploited in Malaysia. However, multiple studies were executed on ILS abroad [6].

The Physical Affordance

Kuntz et al. [32] stated that poorly planned university campuses could hinder learners from utilizing the campus spaces. Nevertheless, an appropriately designed learning environment can promote learning [24]. Several studies indicated that the significance of the physical affordances in the learning environment is: comfort, layout, aesthetics, furniture, colour, ventilation, and

lighting. Layout refers to how learners move around in order to perform their collaborative learning and individual learning. As Yang et al. 2013, stated, learning space design is influenced mainly by air quality and temperature. Harrop & Turpin [19], emphasized that learners described natural features and artificial lightings as essential attributes for outdoor learning spaces. Studies show that reconfigurable furniture plays an essential role in learning activities. Unfortunately, only a few studies mentioned the importance of ambient temperature [26]. Other studies indicated a significant correlation between learning environment across the natural mural, connection to nature, and landscape. Beckers [4], studied the conceptual framework to identify spatial implications of new ways of learning in tertiary education. As noticed by Somerville & Collins 2008, learners prefer open, semi-enclosed and unconfined ILSs. Studies designated that learners seriously perceived the spatial arrangement, visibility, and ICT provisions. Based on the above statement, the physical affordances are attributed as: comfort, aesthetic, ICT facilities, and layout.

The Social Affordance

There are two fundamental principles of social dimension: privacy and concentration and communication and interaction. These affordances aid collaborative learning and personalized learning among learners and originated from environmental psychology studies [20-22]. Research by Beckers [4] shows that behavioural aspects such as interaction, collaboration, and individual have less significant correlation with ILS preferences. Privacy is a dynamic process that governs the anticipated level of interaction and differs based on an individual characteristic. Harrop & Turpin [19], mentioned that learners prefer to have their own little private space for learning activities. Several studies indicated that noise and busyness are the negative affordances that showed a negative impact on learners' learning behaviour[19]. Gurung [5], stated that learners who are distracted by their surroundings during studying activities performed poorly during the final exam. Hence, many learners show self-awareness by expressing a preference for space that less disturbance. However, some learners preferred to have a more vibrant and active ambient [15]. Meanwhile, those performing collaborative learning utilized enclosed space such as a meeting room due to privacy. Personal control denotes the level of autonomy in arranging and deciding what to do, where, and when on their own study area [32]. Learners could control the background noise, temperature and listen to their own music if they liked. Thus, home was a more preferred learning space than university [32]. Based on the above statement, social affordances are operationalized in three attributes: interaction, privacy, and autonomy.

METHOD

This case study intends to explore the learners-environment relationship and to obtain a precise idea of how learners operationalize the ILS on campus. The exploratory study can provide insight into the typology of ILS desired by learners. This study helps list down the learners' ILS satisfaction attribute that influences learners' selection via learners' behavioural and perceptual responses [21, 23-24]. This transactional research's main idea is to conceptualize the learners', the informal learning environment, and the interaction between both constituents [25-26]. As mentioned by Aziz [26], learners' experiences are greatly configured by the learning environment, and in return, learners' configuring the environment. Two main components influence learner's space operationalization in the learning space: the physical dimension and the social dimension. Those dimensions are significantly related to the transactional approach, which contemplating the person-environment relationship [4, 18, 26]. This research's decisive aim is to explore: (i) to determine the preferred ILS typology at Polytechnics, and (ii) to evaluate the learners' satisfaction of ILS at Polytechnics. This study explores the effectiveness of ILS whereby it is segmented into three ILS typology: i) semi-enclosed ILS (SPACE 1): internal corridors, external lobbies, foyers and hallway; ii) semi-outdoor ILS (SPACE 2): courtyard, atrium, terrace,

external corridors and porch; and iii) outdoor ILS (SPACE 3): gazebo, student pavilion, green space and square [21] (refer table 1.0).

The empirical part of this study which is the case study was conducted at three polytechnics: i) Ungku Omar Polytechnic (PUO), ii) Sultan Abdul Halim Muadzam Syah Polytechnic (POLIMAS), and iii) Seberang Prai Polytechnic (PSP). The total sample size in this research accumulated to 1,079 students. The sample was selected from full-time diploma students by using multistage probability sampling. The diploma students were stratified into a semester, consisting of semester one to five, using simple random sampling. Later, two classes from each semester consist of both technical and non-technical programme were selected randomly. A total of 10 classes were selected from each polytechnic. Since students' participation in this research was voluntary, the participants' assents were obtained verbally from the learners before commencing the data collection.

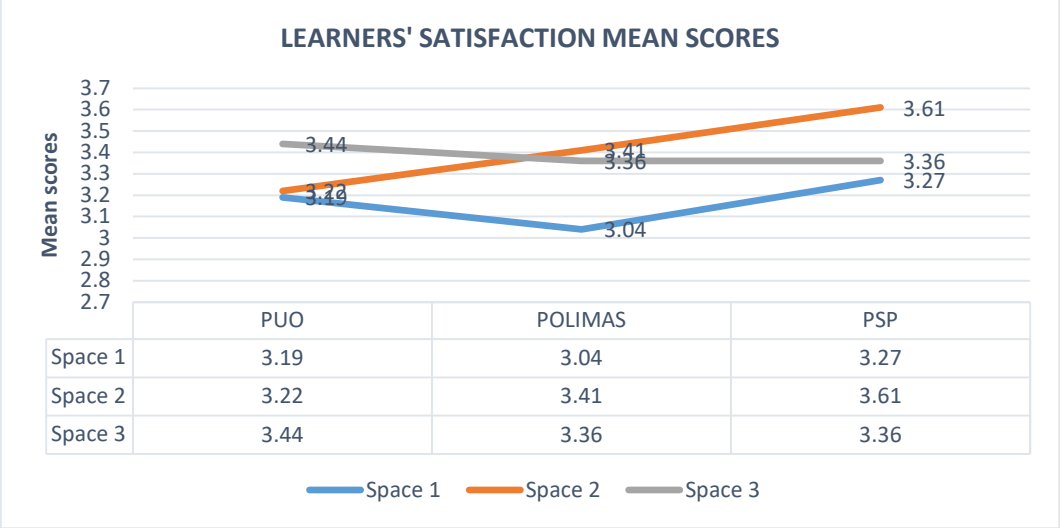
Table 1 A Summary of Typologies of the Three Informal Learning Space

Informal Learning Space Typologies		**Criteria**
Internal lobbies 	Internal corridors 	SPACE 1 - located in between two destination - indoor space - semi-enclosed with 2 walls - good artificial lighting - good active ventilation - less landscape - Precast table and benches
External corridors 	Courtyard 	SPACE 2 - located in between exterior and interior - semi-outdoor - no walls - good cross ventilation - good natural lighting - full with soft and hard landscape - bigger table and chair
Green space 	Gazebo 	SPACE 3 - located between nature to buildings - totally nature and outdoor - fully outdoor space - good natural ventilation - good natural lighting - full with soft and hard landscape - precast table and benches

FINDINGS

Learners' Most Preferred ILS Typology

In sum, the highest mean score in each space indicates that the learners' have a highly positive satisfaction towards the respective space. Therefore, the mean scores of each type of ILS spaces typology presented in Figure 1.



	PUO	POLIMAS	PSP
Space 1	3.19	3.04	3.27
Space 2	3.22	3.41	3.61
Space 3	3.44	3.36	3.36

Figure 1. Mean scores of learners' satisfaction of three types of ILS typology across polytechnics.

Based on Figure 1, it seems that each polytechnic reveals a different result in mean scores on different sites. Apparently, in PUO space 3 obtained the highest mean score (M=3.44; SD=0.33), followed by space 2, (M=3.22; SD=0.35) and the lowest in space 1 (M=3.19; SD=0.35). However, in POLIMAS space 2 is the most preferred location for informal learning (M=3.41; SD=0.43), followed by space 3 (M=3.36 SD=0.41), and space 1 (M=3.04, SD=0.40). Meanwhile, in PSP, the students provided highest mean scores for the space 2 (M=3.61; SD=0.46), followed by space 3 (M=3.36; SD=0.49), and lastly space 1 (M=3.27; SD=0.43). MANOVA has been employed for further analysis to identify if there any statistically significant differences in mean value across polytechnics. Therefore, MANOVA was employed to confirm the significant differences among the mean value score across three polytechnics. In this research, Bonferroni adjustment has been applied in order to reduce Type 1 error. There was a statistically significant difference in mean value score on the combined dependent variables: F (6,2148)=52.856, p<0.001; Wilks' Lambda=.759. When the results of dependent variables were considered separately based on tests of between-subject effect, all three ILS typology reach statistically significant by using a Bonferroni adjusted alpha value of 0.017, space 1: F (2,1076)=9.847, p<0.001, partial eta squared=0.055; space 2: F (2,1076)=27.355, p<0.001, partial eta squared= 0.134; and space 3: F (2,1076)=8.579, p<0.001, partial eta squared =0.046,

The finding shows that learners prefer ILS that is related to outdoor and unconfined space, which is space 2 and 3. Overall, learners preferred ILS that is more connected to nature. The following section results are used to answer the research objective two, which is to evaluate the learners' satisfaction of ILS. In sum, the highest mean score from each dimension indicates that the learners' have a highly positive satisfaction towards the ILS. Hence, hypothesised that both social and physical dimension influence the learners ILS typology preferences.

PUO: Satisfaction Scores On Both Physical and Social Dimension

Mainly, the attributes of learning environments are fragmented into two: 1) Physical dimension and 2) Social dimension. The physical dimension is associated with lighting, air quality, temperature, furniture, ICT, aesthetic and design layout, whereas the social dimension is associated with the individual, collaborative, and interaction. In this study, learners' satisfaction of both dimensions is analysed based on the three ILS typology. The mean scores for the physical dimension and social dimension of ILS in PUO are illustrated in Figure 2. As shown in Figure 2, results show a similar tendency of learners' satisfaction towards physical and social dimensions on three types of ILS typology in PUO. These tendencies confirmed with the mean scores obtained

from the descriptive analysis. The mean scores for the physical dimension are lower compared to the social dimension in space 1, which is M=3.12 (SD=0.37) and M=3.47 (SD=0.59). The trend goes similar in space 2 and 3. The mean values for physical dimension in space 2 are M=3.23 (SD=0.36), and social dimension is M=3.52 (SD=0.61), whereas the mean scores for social dimension in space 3 are M=3.97 (SD=0.49) and the physical dimension is M=3.33 (SD=0.35).

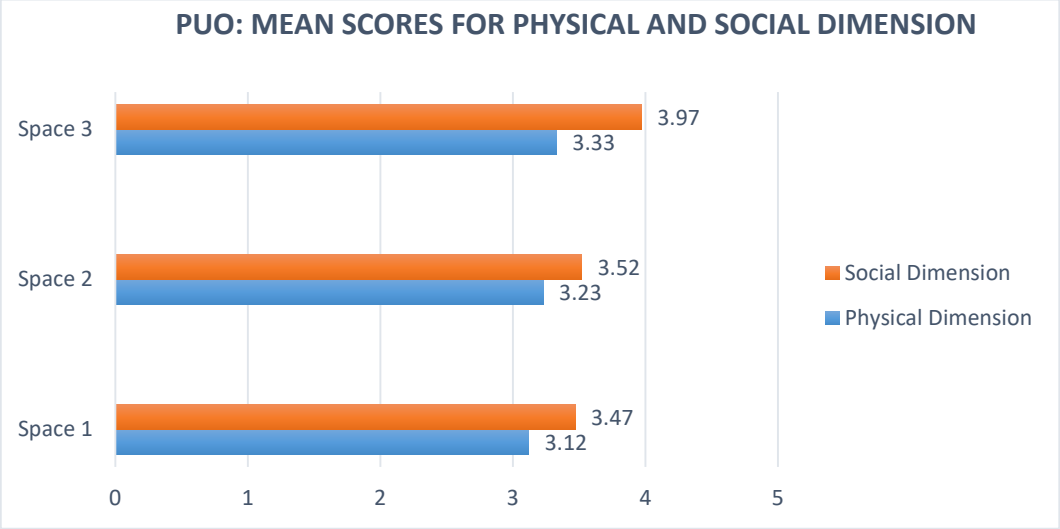


Figure 2. PUO: Mean Scores for Each Dimension.

The independent-sample t-test results indicate that there are statistically significant differences between the mean value for both physical and social dimension at space 1: social dimension (M=3.47, SD=0.59) and physical dimension (M=3.12, SD=0.37); t (714) -9.19, p<0.001, two-tailed). Likewise, there are statistically significant differences between the mean value for both physical and social dimension at space 2: social dimension (M=3.52, SD=0.61) and physical dimension (M=3.23, SD=0.36); t(714)=-7.61, p<0.001, two-tailed). Finally, there are statistically significant differences between the mean value for both physical and social dimension at space 3: social dimension (M=3.97, SD=0.49) and physical dimension M=3.33 (SD=0.35); t(714)=-20.1, p<0.001, two-tailed). These results indicate that some upgrading needed to be done in terms of ambient air temperature, furniture setting, ICT facilities, aesthetic and design layout.

POLIMAS: Satisfaction Scores On Both Physical and Social Dimension

The mean scores for the physical and social dimension in three types of ILS typology in POLIMAS are illustrated in Figure 3. As shown in Figure 3, results show a similar tendency as in PUO. The mean scores for the physical dimension are lower compared to the social dimension in space 1, which is M=2.97 (SD=0.43) and M=3.42 (SD=0.55). Likewise, the trend goes similar to space 2 with mean values for the physical dimension is M=3.30 (SD=0.39), and the social dimension is M=3.52 (SD=0.61). Finally, the trend is the same for space 3. The mean value for the social dimension is higher compared to the physical dimension, which is 3.74 (SD=0.50) and M=3.14 (SD=0.44).

The independent-sample t-test results indicate that there are statistically significant differences between the mean value for both physical and social dimension at space 1: Social dimension (M=3.42, SD=0.55) and physical dimension (M=2.97, SD=0.43); t (714)=-12.049, p<0.001, two-tailed). Likewise, there are statistically significant differences between the mean value for both physical and social dimension at space 2: social dimension (M=3.52, SD=0.61) and physical dimension (M=3.30, SD=0.39); t (714)=-9.45, p<0.001two-tailed). In addition, the trend goes similar to space 3. There are statistically significant differences between the mean value for both

physical dimension and social dimension at space 3: Social dimension (M=3.74, SD=0.50) and physical dimension (M=3.91, SD=0.44); t(714)=-12.8, p<0.001two-tailed). These results indicate that the level of social dimension and physical dimension significantly affects the learners' satisfaction towards selecting informal learning space for their learning activities on campus.

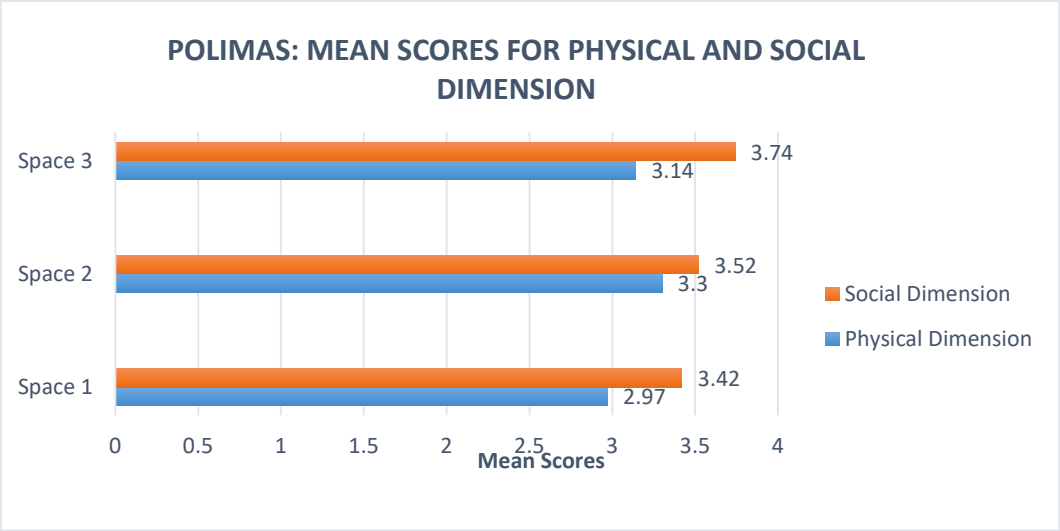


Figure 3. POLIMAS: Mean Scores for Each Dimension.

PSP: Satisfaction Scores On Both Physical and Social Dimension

The mean scores for the physical and social dimension of three types of ILS in PSP are illustrated in Figure 4. As shown in Figure 4, results show that learners from PSP are more satisfied with social dimension compared to the physical dimension. These trends confirmed from the mean scores obtained. Based on Figure 4, the mean scores for the physical dimension are lower compared to the social dimension in space 1, which is M= 3.29 (SD=0.45) and M=3.37 (SD=0.65). In fact, the similar tend goes to space 2, and 3. The mean values for physical dimension in space 2 is M=3.54 (SD=0.46) and in space 3 is 3.30 (SD=0.53), whereas, the mean scores for social dimension in space 2 are M=3.89 (SD=0.71) and space 3 is M=3.78 (SD=0.62).

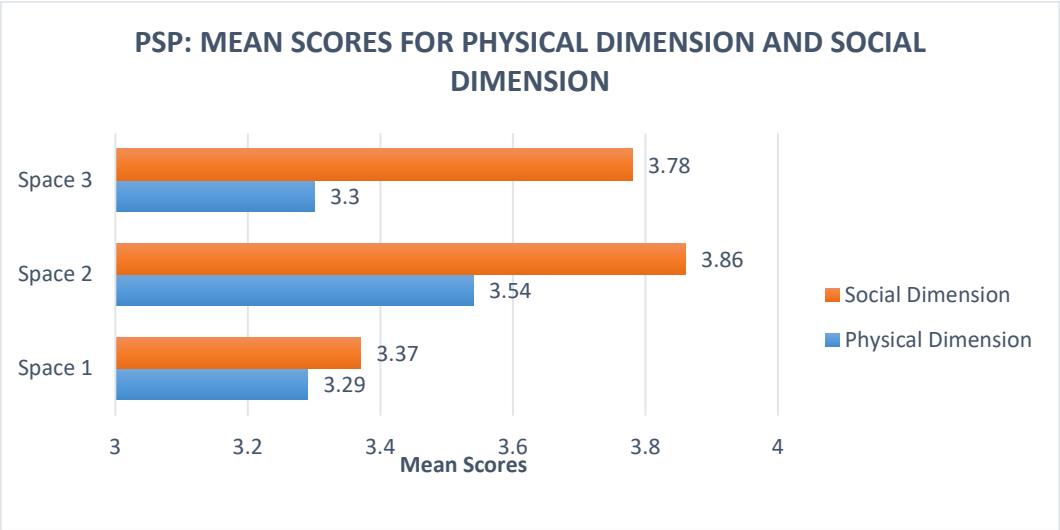


Figure 4. PSP: Mean Scores for Each Dimension.

The independent-sample t-test results indicate that there are no statistically significant differences between the mean value for both physical dimension and social dimension at space 1: Social dimension (M=3.37, SD=0.65) and physical dimension (M=3.29, SD=0.45); t(714)=-1.65,p=0.99, two-tailed). Learners feel that the level of satisfaction in both dimensions in space 1 is the same. All the facilities provided in space 1 is sufficient and adequate. However, there are statistically significant differences between the mean value for both physical dimension and social dimension at space 2: Social dimension (M=3.89, SD=0.71) and physical dimension (M=3.54, SD=0.46); t (714)=-7.11, $p<0.001$. In addition, the trend goes similar to space 3. There are statistically significant differences between the mean value for both physical dimension and social dimension at space 3: Social dimension (M=3.78, SD=0.62) and physical dimension (M=3.30, SD=0.53); t (714)=-11.0, $p<0.001$. These results indicate that space 2 and 3, has a significant impact on the learners' satisfaction towards the selection of the ILS on campus.

DISCUSSION AND CONCLUSION

This research shows that the physical dimension needs to be upgraded compared to the social dimension. Aggregately, the mean values of the physical dimension at three polytechnics are lower than the mean values of the social dimension. Learners show negative perceptions of the physical dimension provision attributes. Imperatively, this research revealed that the ICT facilities attribute is the most influencing attribute. Based on a literature review, ILS is a spatial implication of new learning theories and ICT application in teaching and learning. ILS is a spatial implication of new learning theories and the application of ICT in teaching and learning. The Next Generation Learning Spaces project was conducted in relation to the Pedagogy-Space-Technology (PST) Design and Evaluation framework [22]. The PST framework is beneficial in higher education in evaluating learning space's impact within these three constituents: pedagogy, space, and technology [22]. In fact, these three mechanisms are interrelated and cannot be evaluated independently. The implication of ICT transformed the entire architecture of learning into a new dimension, so-called education 4.0.

No doubt, in the early '90s, the application of technologies in teaching and learning undertakings in the classroom was inadequately caused by the absence of teacher knowledge on ICT. The 21st-century learning environments are nexus with wireless broadband and mobile communications gadgets (M-learning). More concisely, these devices inexorably alter the learners' communication mode, collaborate, cooperate, develop and hand over information [27-28]. As declared by Beckers [4], conventional classroom settings are gradually being substituted by a diversity of learning space to sustenance present-day learning undertakings.

The study found that ILS satisfaction highly relied on social dimensions such as interaction, collaborative, and individual attributes. This show that learners are pleased and complacent with the social dimension's attributes provision at polytechnics. Norhati Ibrahim & Fadzil [14] supported this finding, saying that learners preferred to study at locations that attributed with plug points, seats and steps along walkways and coved open space. This does not mean that attributes such as layout, aesthetic, comfort, air temperature, wind velocity, humidity, and lightings can be neglected or less impacted. Many scholars have concluded that learners learning activities can be affected by the physical environment in which learning occurs [29]. These findings demonstrate the possible value of improving higher education learning environment design and management and maintenance. As Beckers & Voordt [29] mentioned, a well-designed learning environment increases learners' expectations of learning institutions. This research provides insight into the informal learning space spatial configuration for the next generation learning space.

Findings show that learners most preferable informal learning space is Space 2, followed by Space 3, and finally Space 1. The findings indicated that learners preferred to study at semi-outdoor

space, outdoor space, unconfined and associated with nature such as the atrium, terrace, external corridors, porch, pavilion, gazebo, green space, and square. Based on the Environmental-Psychology research, learners explored the transitional space as their venue for social behaviours, social interactions, and social gathering [23]. As reviewed in the literature, semi-enclosed space has more natural lighting and natural ventilation as well. Furthermore, the semi-outdoor space's soft landscape helps learners relax their mind after a long academic session. This study might also drive insight into how learners utilized space for informal learning due to 21st-century learning skills requirement, new teaching and learning approaches supported by advancements in ICT facilities, and how these changes might influence future informal learning space preferences.

REFERENCES

[1] T. Wallner and G. Wagner. (2016). *Academic Education 4.0*, Int. Conf. Educ. New Dev. June. 155–159.

[2] M. Ciolacu, P. M. Svasta, W. Berg, and H. Popp. (2018). *Education 4.0 For Tall Thin Engineer in A Data Driven Society*, 2017 IEEE 23rd Int. Symp. Des. Technol. Electron. Package. SIITME. 432–437.

[3] K. Schuster, K. Grob, R. Vossen, A. Richert, and S. Jeschke. (2016). *Preparing for Industry 4.0 – Collaborative Virtual Learning Environments in Engineering Education*, Autom. Commun. Cybern. Sci. Eng. July, 417–427.

[4] R. Beckers, T. Van Der Voordt, and G. Dewulf. (2016). *Learning Space Preferences of Higher Education Students*, Build. Environ. vol. 104, 243–252.

[5] Gurung, R. A. R. (2005). *How do students really study (and does it matter)?* Teaching of Psychology, vol. 32 (4), 239–241.

[6] N. Ibrahim, N. H. Fadzil, and M. Saruwono. (2013). *Learning Outside Classrooms on Campus Ground: Malaysia*, Asian J. Environ. Stud. vol. **4**. no. 13, 97–110.

[7] S. Nenonen et al., *How to CO-CREATE campus?* (2015). University Properties of Finland Ltd.

[8] N. Ibrahim and N. H. Fadzil. (2013). *Informal Setting for Learning on Campus: Usage and Preference*, Procedia - Soc. Behav. Sci. vol. **105**, 344–351.

[9] Z. Yang, B. Becerik-Gerber, and L. Mino. (2013). *A study on student perceptions of higher education classrooms: Impact of classroom attributes on student satisfaction and performance*, Build. Environ. vol. **70**, 171–188.

[10] M. Ranieri and I. Bruni. (2015). *Qualitative study on the potential of digital narratives for young second- Mobile storytelling and informal education in a suburban area: a qualitative study on the potential of digital narratives for young second- generation immigrants*, Learn. Media Technol.

[11] A. Doshi, S. Kumar, and S. Whitmer. (2015). *Does Space Matter? Assessing the Undergraduate 'Lived Experience' to Enhance Learning*, Plan. High. Educ. J. vol. **V43N1**, December.

[12] K. S. Scott, K. H. Sorokti, and J. D. Merrell. (2016). *Learning 'beyond the classroom' within an enterprise social network system*, Internet High. Educ. vol. **29.**

[13] G. Walton and G. Matthews. (2017). *Exploring informal learning space in the university: A collaborative approach*. Routledge Taylor Francis Group.

[14] D. Casanova, R. Di Napoli, and M. Leijon. (2018). *Which space? Whose space? An experience in involving students and teachers in space design*, Teach. High. Educ. vol. **23**, no. 4.

[15] P. A. Kirschner and P. De Bruyckere. (2017). *The myths of the digital native and the multitasker*, Teach. Teach. Educ. vol. **67**, 135–142.

[16] K. O. Quinnell. (2015). *Student Perception of Informal Learning Spaces Using Gibson's Theory.*

[17] U. A. Nassar and H. S. El-samaty. (2015). *Transition space in higher education buildings as an efficient 'behaviour setting' model*, Int. J. Innov. Res. Sci. Eng. Technol. vol. **3**, no. 1, 8304–8319.
[18] R. Beckers, T. van der Voordt, and G. Dewulf. (2016). *Learning space preferences of higher education students*, Build. Environ., Aug. vol. **104**, 243–252.
[19] D. Harrop and B. Turpin. (2013). *A Study Exploring Learners' Informal Learning Space Behaviors, Attitudes, and Preferences*. vol. **19**, 58–77.
[20] R. Beckers. (2016). *A learning space odyssey*. Brighton: University of Brighton Press.
[21] G. C. Marchand, N. M. Nardi, D. Reynolds, and S. Pamoukov. (2015). *The impact of the classroom built environment on student perceptions and learning*, J. Environ. Psychol. vol. **40**, 187–197.
[22] L. Scannell and R. Gifford. (2017). *The experienced psychological benefits of place attachment,* J. Environ. Psychol. vol. **51**, 256–269.
[23] W. L. Yap, M. Neo, and T. K. Neo. (2016). *The impact of the role of teacher and balance of power in transforming conventional teaching to learner-centered teaching in Malaysian institution of higher education*, Pertanika J. Soc. Sci. Humanit. vol. **24**, no. 4, 1849–1868.
[24] T. Brahimi and A. Sarirete. (2015). *Learning outside the classroom through MOOCs*, Comput. Human Behav. vol. **51**, 604–609.
[25] N. F. Aziz and I. Said. (2015). *Play, Recreation, Health and Well Being*, Play. Retreat. Heal. Well Being.
[26] N. F. Aziz. (2014). *Affordances of School Grounds for Children's Outdoor Play and Environmental Learning.*
[27] B. Cleveland and K. Fisher. (2014). *The evaluation of physical learning environments: A critical review of the literature*, Learn. Environ. Res. vol. 17, no. 1, 1–28.
[28] K. Fisher and C. (2014). Newton, *Transforming the twenty-first-century campus to enhance the net-generation student learning experience: using evidence-based design to determine what works and why in virtual/physical teaching spaces*, High. Educ. Res. Dev. vol. **33**, no. 5, 903–920.
[29] R. Beckers and T. Van Der Voordt. (2013). *Facilitating new ways of learning in Dutch higher education*, 12th EuroFM Res. Symp. 1–11.
[30] Kumar, A., & Bhatt, R. K. (2015*). A Study of Using Informal Learning Spaces at Indian Institute of Technology, Delhi*. Library Philosophy and Practice (e-Journal).
[31] Dole, S., Bloom, L., Kowalske, K., Dole, S., Bloom, L., Kowalske, K., & Carolina, W. (2016). *Transforming Pedagogy: Changing Perspectives from Teacher-Centered to Learner-Centered*. Interdisciplinary Journal of Problem-Based Learning, Volume 10(1).
[32] Kuntz, A. M., Petrovic, J. E., & Ginocchio, L. (2012). *A Changing Sense of Place: A Case Study of Academic Culture and the Built Environment*. Higher Education Policy, 25(4), 433–451.