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## Engaging and retaining students using cutting-edge technologies

**Design of the Outdoor, Classroom, and Electronic Learning Spaces,**

**Theoretical Study.**

By

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**Abstract**

Learning spaces indicate all formed places and situations that equipped to enable both teacher and learners to practice learning and teaching activities. Which could be established inside or outside the buildings. However, learning spaces for long time are divided into formal and informal branches (Diana G. Oblinger, 2006, 1.1-1.3; Aimee Whiteside & Steve Fitzgerald, 2005, 2-6) there is another classification should be treated educationally after technology has been created, considering high capabilities of computer and electronic practices when comparing with traditional ones (Janet Smith, Judy Butler, 2005, 129-140 ; Joellen Maples, Susan Groenke and Dan Dunlap, 2005, 108-128).

Agreeing to the importance of learning spaces designing, moving forward to discovering more characteristics to learning environments, educators are calling for creating an effective spaces for learning and teaching in higher education. In this respect, David Radcliffe, Hamilton Wilson, Derek Powell, Belinda Tibbetts (2009) analyzed pedagogy, examples, and international projects and initiatives for learning spaces in higher education and positive outcomes by design, and recommended to adapt new spaces for modern sciences and life. Diana G. Oblinger (2006,1-3) called to create spaces whether physical or virtual that can face changes in students, information technology, and understanding of learning, she confirmed on spaces that have an impact on learning and bring learners encouraging them for exploration, collaboration, and discussion.

Designing of the learning spaces is the first step in intended learning processes. Including educational criteria and both of humanity and material resources that interact cooperatively towards the educational objectives, therefore, the criteria and resources of spaces directly effect on learning quality and quantity. This means, neglecting designing of learning spaces, could does negatively on learners and teachers roles, and constrains achieving of the learning objectives at the end.

This paper analyses the modern approaches of learning in higher education, specifically related to design of learning environments, it reviews the literature about current trends in designing of learning, and create new concepts in designing of outdoor, classroom and electronic learning spaces.

**Key wards**: Learning Spaces, Learning Environments, Learning Spaces Designing, Outdoor, Classroom and Electronic learning Spaces.

**Introduction**

Most of the educational psychology theories like constructivism and behaviorism confirm the learner and environment interactions, and consider the important of cognitive, affective, and psychomotor learning domains, which would be useful in establishing an enriched spaces for learners’ avtivities.

On the other side, for long time, literature reviewing have been treating learning spaces from formal and informal approaches (Diana G. Oblinger, 2006, 14.1-14.7; Aimee Whiteside & Steve Fitzgerald, 2005, 2-6), embedding all learning places inside and outside of building, but there is a new approach can be suggested in this respect, dividing learning spaces into outdoor, classroom and electronic learning spaces, which totally cover advanced technologies, current learning environments, lessons and topics, and allows for more discussion aiming for the development.

But learning designing into practice should be aimed for graduating qualified learners who are confidential, adaptable, independent and inspired to learn without limited. So, the main challenge in front of the educational researchers is creating learning spaces that enrich and invest unlimited learners’ skills and abilities.

Getting high quality of learning spaces are depending on providing learners with open opportunities challenge their cognition, affective and psychomotor activities. Aimee Whiteside & Steve Fitzgerald (2005, 1-6) studied the suitable relationships between types of learning spaces and the teaching\learning activities aiming for knowing best learning environments and equipment that enrich learners’ skills for effective learning practice.

Providing learning spaces with learners’ needs are suitable for practicing both learning activities and social interactions. As they should need to biological requirements e.g.( food, refreshments and toilets), learning resources e.g. ( library, fields, equipped desks and online computers), and teaching directions e.g. (guidance, feedback, evaluation) that make spaces a relaxing and friendly places for conversation and discussion, in addition to reinforcing interactive learning.

Sir G. Bain (2006) reported that Northern Ireland's education currently performs well to prepare learners to the world of work when establishing wide range of learning spaces that have the ability to provide learners with a modern and high quality educational experience. So learning spaces should be designed based on educational needs along with the intended objectives.

In a close relation with this, contemporary educators hope to provide their learning environments with the best places, furniture, and equipment which agree with biological and educational learners’ needs, exciting their creative skills towards learning. So some researchers like Joseph De Chiara and John Callender (1983) founded humanity standards for educational building, and created spaces enable learners to practice both humanity and studying behaviors creativity. Believing that this is the first step for activity and learning.

**The problem of the paper**

Education in the 21st century have been transferred into quality- based learning and learner-centered, preparing learners for upcoming knowledge era, therefore, discovering suitable learning spaces for higher education is core need, given learners open opportunities to interact with environment’s variables, and make completely understanding about the world, from constructivism approach (McGaw Baker& P. Peterson, 2007; Sharon R. Collins, 2008))

Although there are a widely learning styles already using in higher education, there is demand to explore spaces to keep pace challenges in traditional environments and look for modern and cutting-edge technologies, So some studies examined the relationships between types of learning spaces and the learning activities, and recommended to research on learning environment, in addition the human - centered design (Aimee Whiteside & Steve Fitzgerald; Malcolm Brown& Philip Long (2006, 9.1-9.11).

According to the above, main question of this paper is: What are the characteristics of the learning environments when designing outdoor, classroom, and electronic learning spaces?. This raises several sub-question:

what are the characteristics of learning environment when designing outdoor learning spaces?

what are the characteristics of the learning environment when designing classroom learning spaces?

what are the characteristics of learning environment when designing electronic learning space?.

This procedurally means what are the defining, learning activities and the design aspects for each type of the learning spaces above.

**The importance of the paper**

Although the learning spaces is modern concept, there is need to study the relationships and interactions practiced in learning spaces which include both: materials variables like furniture, equipment, tools, etc... and learning variables embedded learning processes, teaching activities, and humanity behaviors. furthermore, there are just few studies treated these concepts from limited perspectives, and recommended for more research covering another variables in this area, for instance, Aimee Whiteside & Steve Fitzgerald (2005, 1-6); Diana G. Oblinger (2006, 1.1-1.4) and Lesley S. J. Farmer (2009, 1-10). So this paper, has the following important points in particular

* Studying both changes and challenges currently faced higher education, and the continuing development in life aspects.
* Designing learning spaces included outdoor, classroom, and electronic spaces.
* Forming new learning environments associated to cognitive, effective and psychomotor learning domains, that encourage learners to integrated practice for effective learning activities.
* Investing modern technologies to face an increasing number of learners, and cover the excluded in higher education.
* Reinforcing educators and designers to know more about learning characteristics to adapt their environments covering a wide range from outdoor, classroom and electronic learning spaces, and enabling them to teach majority from learning units and lessons.

**Designing of the Learning spaces**

InAgreeing with the educators, who believed that learning occurs and is shaped by the environment and its variables (Lesley S. J. Farmer, 2009, 1-10; David Radcliffe, 2009). This paper discuss suggested new classification for learning spaces divided learning environments into three main spaces, which have been knowing as formal and informal a long time, in short, this paper discuss the designing of three significant learning spaces that are shaped originally from its original environments

* outdoor learning spaces have been planning from nature and non-educational institutes
* classroom learning spaces have been designing from building
* and electronic learning spaces have been developing from advanced technology.

The following discussion treats each space above along with responding to the questions of the paper.

**Outdoor Learning spaces**

In response to the question of the learning environment characteristics when designing outdoor learning spaces, the following an analysis and discussion.

Outdoor learning spaces oneof the oldest methods of teaching that depends on fields outside formal educational buildings, non-educational institutes, and another cultural and historical settings that learning occurs with nature background. Outdoor spaces usually taking place in various places. For example, environment, aquarium, mountains, museums, sees, zoos, gardens, oceans, and forests, etc.. ,which attract learners’ senses and push them to make showing and direct observing looking for information intended. (Andrew J. Milne, 2006, 11.1-11.15; Nancy Van Note Chism , 2006, 2.1-2.12; Lesley S. J. Farmer, 2009, 1-10).

Outdoor learning sittings have plenty of learning materials and resources that are doing as an open book in front of learners and giving them real senses related to the first-hand experience they faced. Cyprien Lomas & Diana G. Oblinger (2006, 501-511) identified outdoor learning spaces as informal places that take place outside schools occurs in libraries, information commons, coffee shops, and any other locations where students can gather information. All the above confirm that there are unique natural factors excite learners’ senses to learn in actual situations and from authentic outdoor spaces.

Outdoor spaces might be divided into branches according to the nature of the space and both content and objectives of lessons. Internally, instructors may prefer to divide their spaces into departments or divisions before studying, each one can be arranged to exhibit its content for learners clearly. They may consider type and nature of places. For example, history, evolution, similarity, age, species, etc.. especially when designing their teaching plan in order to make agreeing with the lesson’s theme.

Designers also could prepare outdoor spaces for exciting the learners’ potentials to study towards practicing learning activities, covering physical, biological and geographical lessons, and environmental topics. Learners could also attain significant information, attitudes and motor skills domains related to field studies. Cyprien Lomas & Diana G. Oblinger and the University of British Columbia (<http://www.ubc.ca/>, 2012) described informal learning spaces as a space where students spend time learning outside of formal learning spaces, and confirmed that they doing in informal seating and walking for practicing essential learning processes like: guided observation, parts checking, data collecting and recording in addition group work with interspersing interactivity.

Designing of outdoor spaces should provide learners with open opportunities for observation, inquiring, and discovering which could be done through group and individual field expeditions, design may also include especial sitting for discussion and evaluation in the end of the expeditions, in addition taking food and refreshments that encourage learners to enjoy learning and more effective interaction with others and exhibitions. The following photos group (1) exhibit some environments and activities included in the outdoor learning spaces.

 

Photos group (1) Environments and activities included in the outdoor learning spaces.

The future of the outdoor spaces is going to add new spaces covering more environments and institutions for studying range of subjects and lessons, and to create virtual spaces make learners to navigate through modern environments.

**Classroom Learning spaces**

In response to the question of the learning environment characteristics when designing classroom learning spaces, the following an analysis and discussion.

Classroom learning space is an organized learning place inside building, which basically consists of interacted variables, teacher, learners and learning materials in addition furniture. However, this spaces are mostly planned for face- to- face teaching and embedded original practices in learning and teaching, it is still focusing on verbal interaction and old style rooms.

Olga Kovbasyuk (2011,9-13) believed classroom is a traditional place for knowledge-orientation that learning happened directly, and information can be learned and tested through face-to-face dialogue, the teacher-of-the-students, and the students-of-the-teacher cease to exist and a new term emerges: teacher-student with students-teachers. Therefore, this gives classrooms the hope in active and direct communication.

Although there is speech that classroom’s achievement takes low levels according to Bloom’s taxonomy. Cyprien Lomas & Diana G. Oblinger (2006, 501-511) discussed that classrooms enable lectures delivering content to students through a combination of diagrams, text, and narration, classroom’s environment encourages to attain the highest levels from both communication and face to face learning. John Carfora (2011, 3-8) studied that classroom represents a formative marketplace of ideas where students come to engage classroom-based learning, along with the science of research and the art of communication, in addition, many students come from previous classroom-based educational settings where inquiry-based research may not have been taught in a meaningful manner. This tow opinions above confirm that classrooms still an old place helps teacher to teach directly, give feedback, conduct discussion and make authentic evaluation, which may enables learners to practice original learning processes moving forward to high level of academic achievement.

An effective designing of classroom spaces should be aiming for organizing rooms, furniture, roles and activities, in addition integrating technological in learners-teacher interactive. This would need to re-layout of lectern, tables, and chairs as well as all furniture form. While teachers ask for making furniture movable to support different kinds of learning activities a variety of rooms layouts have been formed reaching to good classroom space enable to implement learning in group work and presentations, etc.. So some teachers assign students to groups, producing seating maps of their lectures to help facilitate group forming and save time. In other cases, the room is designed for student collaboration. Other spaces are outfitted with movable tables, chairs, and whiteboards so that seating can be reconfigured to suit the activity. In this respect, the study of Aimee Whiteside & Steve Fitzgerald in 2005 discussed three classrooms layouts, traditional classroom (photo 2-1), smart technology – rich classroom ( photo 2-2) and round tables classroom (photo 2-3), and the data analysis indicated that there are relationships between classroom layouts and learning activities and methods in addition the interactions between learners (photo 2-4). Therefore designing of the classroom spaces could planned considered furniture, topic and students.

In general, classroom design needs to incorporate the humanity standards in educational buildings in order to pass a total limited space for each student, at the same time to give students more freedom to be moved, walked and activated. So, it is important to review humanity standards for educational building, and the multi construction perspectives for educational spaces ( Joseph De Chiara and John Callender, 1983, 161-323). In particular, classrooms designing have relatively straightforward requirements: line of sight, good acoustics, and a focal point at the front of the room. Even in formal learning spaces, however, instructors can take advantage of emerging student practices in a variety of ways. (Cyprien Lomas & Diana G. Oblinger ( 2006, 501-511).

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Photo 2-1 photo 2 -2 photo 2-3 photo 2-4

Photos group (2) Types of traditional and future classrooms learning spaces.

The expected development of the classroom spaces need to be considered by new progressing initiatives to transfer from traditional seating table/chair classrooms into technology-rich classroom, smart- classroom, and audio-video interactive technology too, including exposure to food and drink .

**Electronic Learning spaces**

In response to the question of the characteristics of learning environment when designing electronic learning space, the following an analysis and discussion.

Electronic learning spaces indicate the environments provided with information communication and technology tools, that have been enabling students to make new information and share knowledge in different contexts through practice wide range of learning processes, students can use this spaces for connecting, discovering, discussion, downloading, researching, inquiring, etc... So designers have been inviting to choose between the range of technologies’ abilities that suit for studying, and the intended learning objectives.

Malcolm Brown & Philip Long (2006, 9.1-9.11) defined that diverse devises and digital technology are new trends in learning space design. So educators believed that the current technologies and audiovisual media will play an increasing role in 21st century learning and teaching, and the embedding technology into learning and teaching spaces is likely to be an evolutionary process rather than a revolutionary one (Andrew J. Milne, 2006, 11.1-11.15; Diana G. Oblinger, 2006, 14.7). Therefore e-learning spaces not only created modern environments but also developed methods for learning activities by technologies. In this respect, David Radcliffe (2009, 10-16) discussed an increasing number of exemplars of next generation learning spaces likes the Technology Enabled Active Learning (TEAL) project at Massachusetts Institute of Technology (MIT) and the Learning in a Technology-Rich Environment (LITRE) at North Carolina State University.

David Radcliffe and others (2009) studied the guide for the 21st century learning design, explores the relationship between learning technologies and innovative examples of physical space design, and suggested that there is no generally agreed approach to the creation of new learning spaces, therefore, electronic spaces can be formed according to the nature of studying various courses and themes and to encourage creating modern learning methods and activities for students.

Referring to high capacity of technologies. For instance, pervasive wireless networking, iPods, smart phones, digital technologies, internet café with resources and open access IT areas, in addition Open labs with web, that could do effectively in enriching students’ skills for treating various technological equipment and develop their attitudes towards electronic research and communication. Cyprien Lomas. Diana G. Oblinger (2006, 501-511) discussed that designing e-learning spaces encourages students to spend more time on campus and impact on learning space. For example, the café website encourages users to explore their learning preferences and time-management skills, and spaces with laptops tables encourage informal discussion alongside access to IT. In addition, technologies spaces that are providing with mobile and wireless technologies will support a wider variety of pedagogic approaches of learning, for example, e- conference, mobile learning and blended learning styles, at the same time, would cover an educational need comes from different excluded learners who have different circumstances. Therefore, High-tech laboratories in higher education spaces should be designed considering learners’ characteristics, subject matter and the equipment capacity. The following photos group (3) present wide selections from advanced e-learning space for 21st century learning and teaching.

   

Photos group (3) Advanced e-learning spaces for 21st century learning and teaching.

The waited progress to the electronic learning spaces directions towards embedding modern equipped spaces like Spaces for Mobile learning: Tablet PCs, Laptops, Mobile phones, Wireless keyboards/mice, PDAs and Digital cameras, Space for Connected learning: Wired computing, Wireless networks, Wireless-enabled laptops/tablet PCs, Internet-enabled PDAs and mobile phones, and Space for Visual and interactive learning: Video conferencing, Video streaming, Image projection, Interactive whiteboards and Voting devices, in addition to the Space for Supported learning: Assistive technologies, Accessible USB ports, Audio-visual prompts, Video recording facilities, and Plasma screen information points. (David Radcliffe and others, 2009; Diana G. Oblinger and others, 2006)

**Conclusion comparison**

In the end, table (1) is conclusion comparison which collects learning materials, activities and interactions that effect on quality and quantity of the learning processes, and should be considered when designing outdoor, classroom and electronic learning spaces in higher education.

Table (1) comparison between types of learning spaces collects learning materials, activities and interactions.

|  |  |  |  |
| --- | --- | --- | --- |
| Electronic learning spaces | Classroom learning spaces | Outdoor learning spaces | Comparison |
| Learning happen by using virtual materials, e.g. e-texts, simulations and information technology and communication, as spaces to intensive knowledge resources. | Learning materials include actual materials, e.g. books, labs equipment and tools, as spaces to limited information resources. | Learning materials based on environmental and physical resources, e.g. gardens, zoo, mountains, museums, including a wide range of knowledge | Learning materials |
| Using learning by showing and perception, based on information technology and communications, including visual thinking and imagine with manipulating and manual proficiency. | Concentration on reading, understanding and evaluation inside classrooms and learning buildings, depending on logical thinking and manual treatments. | Expanding through ecological components, and based on observation and checking, and then data collecting from natural resources. For example, the sun, air, land, seas, rivers. mountains, trees, and other organisms, practicing diverge thinking and open inquiring. | Learning activities |
| Hypothetical, during both direct and indirect communication, with exchange of the homework, tasks and teacher's feedback. Dominating  independent and individual feelings between both e-teacher and individuals. | Directly, through face –to- face teaching, with teacher, colleagues, and resources, expanding of dependent emotions between teacher and students. | Opening, during true situations, with first hand and direct experience, bringing social behaviors between teacher and learners. | Learner Interactions |

**Resources**

A Guide to 21st Century Learning Space Design; Designing Spaces for Effective Learning:[www.jisc.ac.uk/elearning\_innovation.html](http://www.jisc.ac.uk/elearning_innovation.html),www.jisc.ac.uk/eli\_learningspaces.html. 2007.

Bain, Sir George, School for the Future: Funding, Strategy, Sharing, Report of the Independent Strategic Review of education, December, 2006.

Baker, E.; McGaw, B. & Peterson P (Eds), International Encyclopedia of Education 3rd Edition, Oxford: Elsevier (in print), 2007.

Brown, Malcolm & Long, Philip, Trends in Learning Space Design, in Oblinger, Diana G., Learning Spaces, [www.educause.edu/learningspaces](http://www.educause.edu/learningspaces), 2006, 9.1-9.11.

Carfora, John: Navigating Between Teaching, Learning and Inquiry, The International HETL Review, The International HETL Association, New York, Vol.1, January-February, 2011, 3-8.

Chiara, Joseph De and Callender, John, Time - Saver Standards for Building Types, McGraw-Hull International Editions, Architecture Series, 1983.

Chism, Nancy Van Note, Challenging Traditional Assumptions and Rethinking Learning Spaces, in Oblinger, Diana G., Learning Spaces, [www.educause.edu/learningspaces](http://www.educause.edu/learningspaces), 2006, 2.1-2.12.

Collins, Sharon R, B.Voc.Ed., Enhanced Student Learning Through Applied Constructivist Theory, Transformative Dialogues: Teaching & Learning Journal, 2008, Vol. 2, (2) PP. 1-9.

Farmer, Lesley S. J., Library e-learning spaces, World Library and Information Congress: 75 th IFLA General Conference and Council, http://www.ifla.org/annual-conference/ifla75/index.htm, 2009, 1-10.

Kovbasyuk, Olga: Dialogue as a Means of Change, the International HETL Review, The International HETL Association, New York, Vol.1, January-February, 2011, 9-13.

Learning Spaces Design Guidelines, Appendices A,B,C., Facilities Planning, Infrastructure Development, University of British Columbia, UBC Documents, <http://www.ubc.ca/>, 2012.

learning Space in Higher Education, Positive Outcomes by Design Space, The University of Queensland, Australian Learning& Teaching Council, 2009, 10-16.

Maples, Joellen, Groenke, Susan and Dunlap. The Web Pen Pals Project: Students' Perceptions of a Learning Community in an Online Synchronous Environment, Journal of Interactive Online learning , V.4, N.2, 2005, ISSN:1541-4914, [www.ncolr.org/jiol](http://www.ncolr.org/jiol).

Milne , Andrew J., Designing Blended Learning Space to the Student Experience, in Oblinger, Diana G., Learning Spaces, [www.educause.edu/learningspaces](http://www.educause.edu/learningspaces), 2006, 11.1-11.15.

Oblinger, Diana G., Learning Spaces, E education, Transforming Education Through Information Technology, [www.educause.edu/learningspaces](http://www.educause.edu/learningspaces), 2006, An EDUCAUSE e Book.

Radcliffe, David; A Pedagogy-Space-Technology (PST) Framework for Designing and Evaluating Learning Places, in Radcliffe, David and others; learning Space in Higher Education, Positive Outcomes by Design Space, The University of Queensland, Australian Learning& Teaching Council, 2009.

Radcliffe, David; Wilson, Hamilton; Powell , Derek and Tibbetts , Belinda; learning Space in Higher Education, Positive Outcomes by Design Space, The University of Queensland, Australian Learning& Teaching Council, 2009.

Strickland, Janet Smith, Butler, Judy: Establishing Guidelines for Determining Appropriate Courses for Online Delivery, Journal of Interactive Online learning, V.4, N.2, 2005, ISSN:1541-4914, [www.ncolr.org/jiol](http://www.ncolr.org/jiol).

University of British Columbia, Learning Spaces Design Guidelines, Appendices A,B,C., Facilities Planning, Infrastructure Development, , UBC Documents, <http://www.ubc.ca/>, 2012.

Whiteside, Aimee & Fitzgerald, Steve, Designing Spaces for Active Learning, Implications, InformeDesign, Vol. 07, Issue 1, [www.informedesign.umn.edu](http://www.informedesign.umn.edu), University of Minnesota, 2005, 1-6.