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Influence of Physical Learning Environment in Student's Behavior and Social Relations

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ABSTRACT One of the current challenges of education is to promote active learning, interaction and participation in the classroom. This challenge might find physical barriers along the way, which hinder or fully prevent it from success. Environmental psychology has been commissioned to study these relationships and behavior of individuals and how they can be influenced by the design of the physical learning environment. The analysis of the more traditional educational environments shows strong patterns of the power of teachers over students. Therefore, the aim of this work is to investigate the physical design factors that influence the learning environment in social relations and the behavior of students in order to help professionals regarding the design and management of educational spaces. Among these factors are those related to the spatial organization and the determining factors of environmental psychology.

INTRODUCTION

Educational scenarios where learning occurs have social structure connotations of power that can promote or limit interactions or influence student's behavior. This complex human environment is needed to be investigated from an anthropological point of view from the fields of Architecture, Education and Psychology. Social processes in educational environments have become more important since students are supposed to be co-producers in the learning process where they contribute actively to producing knowledge. Although more attention has been paid to effective teaching methods, the environment is one of the factors that most influences the behavior of students. Physical learning environments are composed of a set of dimensions (IPTS 2006): access to social spaces, presence of digital connection, friendly design, flexible spaces that foster creativity, among others. However, a space without a proper use of it does not have to involve an improvement. The design must be settled into a methodology or philosophy of education (Woolner et al. 2012), which increases the complexity of the case of universities due to the great diversity of teachers (Steel and Levy 2009) and thus conflict between teaching methods and spaces for courses. This situation presents a multicultural educational institutional and local cultures that can pursue interests, disciplines or conflicting values (Keppel et al. 2011). Moreover, environmental psychologists have considered that the effect of physical learning space must be analyzed considering four dimensions, among which they include social behavior (Dos Santos and Matai 2007) linked to that learning process.

In order to understand the space as an environment, it is necessary to understand the relationships between human and the environment in which they participate as well as the ability to project themselves into it. The learning environment becomes swap space, stimulating and thoughtful, both for learners and for teachers (Duarte 2003). A learning space is always generated and organized by an educational agent for one or more students. This educational agent intentionally plans a set of activities, actions and forms of intervention aimed at achieving the objective of learning by students. Definitely, education is the generic agent to designate "who heads the educational activity" and trainees are "those who learn and develop". The educational agent is not always a teacher and learners are not always children from a school (Otálora 2010).

Therefore, space becomes a constitutive basic element of educational activity where students interact under certain conditions and phys-

ical, human, social and cultural circumstances in order to generate meaningful learning experiences. Thus, well-designed spaces offer their occupants the opportunity to act in a certain way and cause a positive impact on behavior and social relationships of students (Bennett 2006).

Definitely, the design of a learning space based on the recognition of its social dimension allows students to handle the socialization positively. However, the current traditional classroom organization stubbornly persists, and within that organization the professor as the main focus and main authority.

OBSERVATIONS AND DISCUSSION

Barriers and Power Relations

The most common model of learning environment organization is still focused on teacher canons and on the individual work of students. Power relations are inscribed in certain spaces within the classroom, for example, the situation of the teacher's desk which is a symbol of power and surveillance point (McGregor 2004). However, when attempts are made to make changes in educational spaces in order to make them more comfortable and to facilitate interaction between learners, students may have to learn to accept an environment different from what they are already familiar with. Currently, a traditional organizational image is stuck in the minds of students so any change in their educational space may be considered a threat.

Design of classroom organization in rows is a type of design that does not allow each student to take their own learning pace because the space imposes its laws in any disciplinary organization and tries to maintain control. Classroom arrangement in small groups means that the teacher's table will no longer hold that power situation while students are grouped in pairs or small groups. The room arrangement must meet certain curricular content in order to suit interactive learning (cooperation and information exchange). Space is directly involved in the creation and maintenance of the learning environment and can be understood as a constellation of ongoing relationships and not as a predetermined place (Nespor 1997). Management of classrooms, laboratories, staff rooms and playgrounds in secondary schools determine the maintenance of certain power relations. So the exploration of spatiality of schools is a way of highlighting these relationships because the physical spaces materialize past practices and social relations (Jacklin 2004). Good classroom design allows more positive interactions between teachers and students, so the likelihood of problem behaviors occurring is reduced.

Although design changes are used preventively, Guardino and Fullerton (2010) show that through modifications the classroom environment can increase academic engagement and reduce disruptive behavior. It is crucial that the design of classrooms ensures flexibility to anticipate changes of educational goals and educational programs that are reflected in organizational strategies (Barrett and Zhang 2009). Therefore, it is essential that spatial organization allows different learning experiences to increase learning. That is why Bautista and Borges (2013) propose flexibility as one of the principles that should govern the learning spaces. This should be matched with other principles such as adaptability, which means that the space can be adapted to the needs of students, and multiplicity, which means that these types of classrooms are equipped with features that allow the use of various types of resources and stimuli.

Factors that Influence Behavior and Social Relations

Environmental Factors

Joseph Gottler (1955) was one of the first researchers to discuss factors that influence learning and he established that natural, physical and environmental factors not only have an aesthetic influence but are also real educational factors that influence behavior. These factors directly affect the comfort of students and influence behavior and learning outcomes so that environment and its interaction with the individual's personal characteristics are presented as a powerful determinant of human behavior (Che Ahmad et al. 2010).

In any case, space must respond to the basic needs of students. In this sense, light, temperature, color and sound, whose characteristic properties influence the behavior of individuals, are the most talked about environmental factors in investigations.

Lighting

A part of the learning environment is based on sensory stimulation. Therefore, it has played with lighting and color variations of the surface materials of the classroom to stimulate the senses. In addition, one of the fundamental objectives of lighting is giving visual support. Therefore, it is necessary to strike a balance between natural and artificial lighting. Prolonged exposure to artificial light increases the excitation of the nervous system, causing stress in students and leading to irritability (Küller and Wetterberg 1993). Juslén and Tenner (2005) maintained that through light changes, one could improve a number of things in relation to the students within the learning space. Among these are interpersonal relationships, that is, that adequate lighting helps improve social relations because it provides a clear vision, both of oneself and of others so the students can communicate and cooperate properly.

Colour

Colour is linked to the previous factor. It is a design element that presents a series of psychological effects, such as stimulation or relaxation, also affecting mood and behavior extension. Warm colors like red promote more active behavior and action-oriented activities, while the range of cool colors like blue facilitate passive behavior patterns (Engelbrecht 2003; Ocvirk et al. 2009).

Acoustics

Relationship between sound and learning is complex because it depends on a number of factors such as the property of sound, the characteristics of the listener and the types of noise. The main objective of sound will therefore maintain the right conditions for reproduction and reception of the desired sounds. Klatte et al. (2010) noted that it is necessary to evaluate the sound characteristics of the classroom because it is related to the achievement, spatial cognition and density. They also conducted a study in which they found that acoustic conditions in the classroom did not meet the needs of listeners, implying a negative impact on the perception of students and on the space and its occupants as well as in their social relationships, which increased the level of stress and arousal that flowed into aggressive behavior among students. On the effects of sound as a factor in designing the environment, we look at music. The proper use of background music on behavior and the work done in class has promoted cooperative behavior and encouraged good humor (Griffin 2006; Hallam et al. 2002).

Temperature and Ventilation

Another environmental factor to which reference was made earlier was the temperature which is placed in connection with ventilation. Thermal comfort is achieved by maintaining the temperature in response to movement of air and moisture. Anderson et al. (1995) showed in their studies that high temperatures alter wellbeing, social relationships and performance. In turn, physiological changes that may cause irritability, fatigue and confusion also occurred. However, when temperatures are low,the physiological effects represent a major distraction in students and also a heightened state of alert, that is, increasing the levels of nerve activity and therefore preparing the mind for action (Moraes and Ismail 2007). Moreover, exposure to poor air quality is related to the decrease in attendance by the student and the existence of passive social behavior (Cheryan et al. 2014).

Spatial Factors

After reviewing environmental factors that can affect the behavior of students in learning spaces, it is worth noting the scope of spatial factors as the physical conditions of an environment, such as furniture or the organization of space, also affect students (Moslemi and Mohd 2012).

Spatial Organization

Traditional layout in educational spaces is totally focused on the teacher. This arrangement hinders the natural communication between students arranged in the classroom; and also the shyest students will not be able to express themselves and train their channel of expression on the teacher. That organization of learning space produces the opposite of its original purpose. Instead of encouraging the smooth expression of knowledge, that layout is inhibiting the social

learning process. An example would be the U-shaped arrangement of the seats that support social interaction between students (Gump 1987). In relation to spatial organization are the constraints of environmental psycholo-gy: personal space, privacy, territoriality and overcrowding. Personal space is understood as a regulation of interpersonal boundaries and as maintaining the level of reaction to the invasion of one's space by anyone, so its main function will be protection of the individual with privacy as regulator. It is a factor that helps create the condition for a proper operation of the learning space. Among older students, there may be a need to "keep distance", showing negative behavior if your space is invaded by an unkn-own person. Therefore, it is essential to take it into account in order to find out why certain circumstances and interactions are successful and others are not (Häkkinen and Hämäläinen 2012). Moreover, privacy attached to territoriality involves a need for students to maintain access control (Altman 1975) to a certain place that could be considered "proper" within this public learning space and territoriality involvesthe customizing (Hall 1966) of space. In this sense, space design should try to reduce aggression, increase control and promote a sense of order and security in order to alleviate the negative behaviors that would lead to the invasion or interference in space. Furthermore, overcrow-ding, on a personal level, has a great immediate impact on people and involves two factors: crowd and concentration. This factor in the field of education generates a series of experiences for students as timeouts or rejection towards each other, creating an emotional detachment from the classroom and the teaching process.

Furniture

The arrangement of furniture is also conditioning when it comes to behavior. However, despite the number of hours used to present the different components of classroom furniture such as chairs, in addition to the postural habits (Molenbroek et al. 2003) acquired with their use, there has not been enough time dedicated to them in the field of research. They can promote various social gatherings. Since the arrangement of the teacher-centered classroom that seeks control of students and promotes individualistic behavior was put in place, there have not been layouts designed to promote cooperation among students. The main function of furniture will be to support students during classroom activities. Therefore, many of the designs of active learning conceive of the teacher's desk as mobile and placed in the center, while the tables of students are designed precisely to achieve positive social behaviors of interaction and cooperation with round, rect-angular or octagonal shapes (Painter et al. 2012).

CONCLUSION

After analyzing all these studies, we can conclude that there are certain factors of the physical learning environment that influence behavior and social relations; these include environmental and spatial factors. It is important to study the factors that influence social relationships in the classroom in order to contribute to a broader understanding of their impact on the learning process since the new learning methodologies are aimed at a more active role for the students. Understanding barriers related to space design factors will improve the teaching-learning process. The development of an integrated model that connects all the factors relating to the physical learning environment is necessary in order to improve the overall understanding of their relationships and improve learning environments with the respective improvement of learning outcomes.

Through this review, we intend to inform about this research topic that requires continuous development in order to better understand the relationship between the factors conditioning the physical learning environment and students.

REFERENCES

Altman I 1975. *The Environment and Social Behaviour: Privacy, Personal Space, Territoriality and Crowding*. Monterrey, CA: Brooks/Coles.

Anderson CA, Deuser WE, DeNeve K 1995. Hot temperatures, hostile affect, hostile cognition, and arousal: Tests of a general model of affective aggression. *Personality and Social Psychology Bulletin*, 21: 434-448.

Barret P, Zhang Y 2009. *Optimal Learning Spaces. Design Implications for Primary Schools*. Salford: Salford Centre for Research and Innovation in the Built and Human Environment.

Bautista G, Borges F 2013. Smart Classrooms: Innovation in Formal Learning Spaces to Transform Learning Experiences. *Bulletin of the IEEE Tech-*

nical Comitee on Learning Technology, 15: 18-21.

Bennett S 2006. First questions for designing higher education learning spaces. *The Journal of Academic Librarianship*, 33: 14-26.

Che' Ahmad CN, Osman K, Halim L 2010. Physical an psychosocial aspects of science laboratory learning environment. *Procedia- Social and Behavioral Sciences*, 9: 87-91.

Cheryan S, Ziegler S, Plaut V, Meltzoff AN 2014. Designing classrooms to maximize student achievement. *Behavioral and Brain Sciences*, 1: 4-12.

Dos Santos PHL, Matai S 2007. Cooperative Education: The Physical Environment. *International Conference on Engineering Education (ICEE)*.

Duarte D 2003. Ambientes de aprendizaje: Una aproximación conceptual. *Estudios Pedagógicos*, 29: 92-113.

Engelbrecht K 2003. *The Impact of Color on Learning*. NeoCon.

Griffin M 2006. *Background Music and the Learning Environment: Borrowing from Other Disciplines*. Master of Education Proyect. Australia: University of Adelaide.

Guardino C, Fullerton E 2010. Changing behaviors by changing the classroom enviroment. *Teaching Exceptional Children*, 42: 8-13.

Gump PV 1987. School and classroom environments. In: D Stokols, I Altman (Eds.): *Handbook of Environmental Psychology*. New York: Wiley, pp. 691–732

Häkkinen P, Hämäläinen R 2012. Shared and personal learning spaces: Challenges for pedagogical design. *The Internet and Higher Education*, 15: 231-236.

Hallam S, Price J, Katsarou G 2002. The effects of background music on primary school pupil's task performance. *Educational Studies*, 21: 111-122.

Hall E 1966. *The Hidden Dimension*. New York: Doubleday.

IPTS 2006. The Future of ICT and Learning in the Knowledge Society. *Joint DG JRC-DG EAC Workshop*, 20-21, Sevilla.

Jacklin H 2004. Discourse, interaction and spatial rhythms: Locating pedagogic practice in a material world. *Pedagogy, Culture and Society*, 12: 373-398.

Juslén H, Tenner A 2005. Mechanisms involved in enhancing human performance by changing the lighting in the industrial workplace. *International Journal of Industrial Ergonomics*, 35: 843-855.

Keppel M, Souter K, Riddle M 2011. *Physical and Virtual Learning Spaces in Higher Education: Concepts for the Modern Learning Environment*. Hershey, Pensilvania, EEUU: IGI Publishing (IGI Global).

Klatte M, Hellbruck J, Seidel J, Leistner P 2010. Effects of classroom acoustics on performance and well-being in elementary school children: A field study. *Environmental Behavior*, 42: 659-692.

Küller R, Wetterberg L 1993. Melatonin, cortisol, EEG, ECG and subjective comfort in healthy humans: Impact of two fluorescent lamp types at two light intensities. *Lighting Research and Technology*, 25: 71-80.

McGregor J 2004. Space, power and the classroom. *Forum*, 46: 13-18.

Molenbroek J, Kroon-Ramaekers N, Snidjers C 2003. Revision of the design of a standard for the dimensions of school furniture. *Ergonomics*, 46: 681-694.

Moraes C, Ismail K 2007. The influence of "ventilate sill" design as a device to improve natural ventilation inside school buildings in hot and humid climate. *9th REHVA World Congress Climate 2007, "Wellbeing Indoors"*. Helsinki.

Moslemi M, Mohd M 2012. Exploring students behavior on seating arrangements in learning environment: A review. *Procedia-Social and Behavioral Sciences*, 36: 287-294.

Nespor 1997. *Tangled Up in School: Politics, Space, Bodies, and Signs in the Educational Process*. New Jersey: Lawrence Erlbaum.

Ocvirk G, Stinson E, Wigg R, Bone O, Cayton L 2009. *Art Fundamental: Theory and Practice*. New York: McGraw-Hill.

Otálora Y 2010. Diseño de espacios educativos significativos para el desarrollo de competencias en la infancia. *Revista en Ciencias Sociales*, 5: 71-96.

Painter S, Fournier J, Grape C, Grummon P, Morelli J, Whitmer S, Cevetello J 2012. *Research on Learning Space Design: Present State, Future Directions*. Ann Arbor, MI: SCUP Publications.

Steel C, Levy M 2009. Creativity and constraint: Understanding teacher beliefs and the use of LMS technologies. In: R Afkinson, C Mcbeath (Eds.): *Same Places, Different Spaces*. Proceedings of ASCILITE Conference Auckland 2009. New Zealand: Auckland University, pp. 1013-1022.

Woolner P, McCarter S, Higgins S 2012. Changed learning through changed space: When can a participatory approach to the learning environment challenge preconceptions and alter practice? *Improving Schools*, 15: 45-60.