The Impact of the Physical Learning Spaces on Learning Process

Mohsen Ghasemi Ariani

Abstract The present study explores the impacts of physical learning spaces on students' outcomes and learning process based on the Iranian junior high school students' ideas. It also draws on the ways in which specific environmental conditions impact upon student learning. The environmental conditions scrutinized are factors such as physical spaces in the classrooms, school built spaces, and school learning environmnets. Based on interviews with students and the analysis of their scores, the findings reveal that typical school spaces and classroom layouts vary between the students in ways that their outcomes are related to their understandings and philosophies of education and learning. Besides, the present study can encourage school planners and language teachers to pay serious attention to the psychological dimension of physical learning environments, which is often taken for granted despite its vital impact on learning process.

Keywords Physical learning spaces • Student achievement • Learning process

1 Introduction

The quality of learning space is significant in shaping students' beliefs about the subjects that they study and the whole education system (Zedan 2010). Learning space is a place where students congregate for some periods of time to take part in learning process. As well, the space created during the learning activities is considered as an important element in the learning process. And the essence of a learning space is the interaction between persons and the setting within which they are engaged (Ahmad et al. 2014). To examine the interrelationship between learning spaces and student outcomes, it is important to pay more attention to environmental conditions, environmental psychology, and building designs.

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Traditionally, learning spaces have been designed by traditional architects, and they generally mirror traditional rather than contemporary architectural and educational principles, often leading to the reproduction of the traditional model of schools in Iran. To this end, Iranian school designers and professionals should consider aesthetic and environmental sustainability issues and cooperate with experienced teachers emphasizing learning and architectural issues (Mortazavi 2011).

1.1 Literature Review

Temple (2007) and Keep (2002) refer to a number of sources that describe the ways in which specific environmental conditions impact upon student learning. The environmental conditions described are factors such as noise, temperature, air quality, ventilation, and lighting (Higgins et al. 2005; Lackney and Jacobs 2002; Earthman 2004). Earthman (2004) rates temperature, heating, and air quality as the most important individual elements for student achievement. Another line of research interest relates subjective perceptions of noise and noise annoyance to objective measures of noise. Dockrell and Shield (2004) conclude that the judgments of both adults and children correlate well with background noise, while noise annoyance is more related to peaks of noise and some noises are perceived as more annoying than others. In relation to student achievement, it is argued that day lighting offers the most positive effect (Earthman 2004). Engelbrecht (2003) argues that we have a basic, biological reaction to color and that "the psychological reaction to color does not preclude the basic biological reaction that stems from human evolution." Depending on the age of children, different colors are considered stimulating; younger children prefer bright colors and patterns, while adolescents prefer more subdued colors. Barrett and Zhang (2009) state that every effort should therefore be made in the design stage to create the ideal physical conditions for learning to take place. It can be argued that "appearance of the school is important in terms of the negative or positive messages students receive about themselves. Students internalize any reflections on the buildings or school on themselves as they and their teachers identify with their school, its image and reputation" (Blackmore et al. 2011). Rudd et al. (2008) and Waterhouse and Coopers (2010) also found that student engagement increased in newer, well-designed buildings. As well, a Canadian study by Roberts (2009) found that engineering assessments of facilities are unrelated to the quality of teaching and learning environments (QTLE) in schools but that the educators' assessments of school facilities are systematically related to the QTLE in schools. This highlights the fact that the educational purposes of schools need to be taken into account in order to understand the place and importance of facilities with relation to learning outcomes. A focus on educational relevance is more important than a purely engineering-based assessment. Besides, much of the most recent research is driven by the need to incorporate technologies of various forms within learning spaces and how this both demands new teaching practices and creates new possibilities. Contemporary computing or other technology education is more

ubiquitous since it is integrated across and into the curriculum. Computer use due to mobility of laptops, netbooks, and wireless is pervasive, and connectivity means blurring the lines between school, leisure, work, home, and spaces. The issue now is how to facilitate the use of mobile technologies throughout schools, in transition spaces, and in Internet cafes where educational and social interactions can be encouraged while privacy and safety are addressed (Cilesiz 2009).

2 Method

The present study is an attempt to explore how physical learning spaces have effect on students' outcomes and learning process. To this end, 100 Iranian students (third grade) of five junior high schools as a case participated in this study. All of them were male and their average age was 15. Choosing a case is not necessarily concerned with representativeness and typicality of the case but with its accessibility and the opportunity it provides to the researcher to learn (Stake 2000). Their classes were held 5 days a week, which was compulsory for all the students. The junior high schools in which the interviews were carried out were public schools. The students were asked to think about and raise their ideas about some aspects of the physical learning environment that contribute to or impede effective teaching and learning. Some questions such as "what makes a good school (physical) learning space; what influence do school (physical) learning spaces have on student learning outcomes; which elements of school learning spaces make the most difference to student behavior, learning, and why; and is changing the learning spaces 'worth doing' if it is done as a design process" were asked. In fact, they were encouraged to express their opinions about the impacts of (physical) school learning environments on student learning outcomes. Besides, components and elements of school learning spaces such as school built space and physical space in the classroom were explained. School built space includes school built environment, noise, lighting, color, and other design issues such as outdoor spaces. In addition, physical spaces in the classroom consist of tables and equipment, arrangement and layout, and information and communications technology (ICT). As well, the half-term exams administered to the students were standard teacher made. The data have been collected through interviews and the half-term exams. The interviews were recorded and analyzed.

3 Results

Studies about students' ideas conclude that the quality of the physical environments was the key element factor to them. But they do not affect their performance. In fact, they have other reasons for studying and progressing. They try their best for the purpose of obtaining some concrete goals such as a job, graduation, or to pass the course. Teachers and their methodologies and school management are important to

their parents in general. Students believe that school built environment and physical environment in the classroom are ideal factors that can have a motivational and psychological effect. Due to their sociological and political situations, they cannot expect the ideal elements all together. On the other hand, the following are the participants' ideas of learning environmental conditions: The majority of the students rate temperature, heating, and air quality as the most important individual elements. Concerns about exposure to chronic external noise lead to an effective reduction in learning progress.

Although the visual environment such as lighting and color affects students' ability to perceive visual stimuli and affects their mental attitude and performance, they had to not pay attention to these elements. The participants used to study hard in order to pass the course. Other issues in the design and layout of the whole school were mentioned as elements which might be important. Talton and Simpson (1987) comment that the classroom is the basic structural unit of our educational system and the nature of the classroom is clearly affected by the school design and objectives adopted at the school level. To the participants, they have never thought about ergonomic seating, positioning, and the arrangement of the students' desks and chairs. They had no ideas about them. One of the four key predictors of student performance in the building assessment scale of Tanner (2000) was availability of technology for teachers and students. Based on an interview with the students, computers in the classroom are a powerful educational tool, and their use is becoming gradually available in private schools. The students were not allowed to bring laptop, phone pad, and cell phone. Some of them were asked not to attend their classes because of cell phones and laptops that they brought inadvertently. Students asked for educational tools such as computer and communication technology since their public schools did not have modern ones. The participants had different reasons for studying hard and passing, some of them studied because of their family. They tried to get good marks to satisfy their parents. The other students studied hard because of better opportunities. When top students were asked to talk about the reasons of getting good marks and their connections to learning spaces, they said that they were expected and used to study hard. On the other hand, weak students believed that their family situation played an important factor. They did not know exactly whether components of school learning environments make the most difference to their outcome and performance in a better situation or not. However, they did like to study in comfortable learning spaces.

4 Discussion

Well-designed learning spaces have a motivational effect. Learning areas infused with natural light, for example, provide an environment that is easy and pleasurable to work in. A successful school is the result of an ambitious collaboration between school planners and teachers to construct a learning environment that addresses the needs of the twenty-first-century learners in a twenty-first-century world. It is

helpful to incorporate best practices of technology and new learning methodologies as well as a range of environmentally responsible design and construction features—indoors and outdoors. Schools should offer an opportunity to connect learning to the outside world and to bring environmental issues to life in the classroom. They should be in and of themselves inspiring and innovative teaching tools. Students should have unique opportunities to see how the world and its life forms and resources are interconnected and how one action can have an effect on other people and the environment (Microsoft Corporation 2008). The physical characteristics of learning spaces can affect students emotionally, with important cognitive and behavioral consequences. Spaces that elicit positive emotional responses may lead not only to enhanced learning but also to a powerful, emotional attachment to that space. It may become a place where students love to learn, a place they seek out when they wish to learn, and a place they remember fondly when they reflect on their learning experiences. In any learning environment, physical characteristics that cause discomfort can be expected to interfere with learning; those that produce positive emotional states can be expected to facilitate learning (Graetz 2006).

Research on the impact of information learning spaces on student learning outcome is not as voluminous in Iran. So, those responsible for designing learning spaces should be aware that today's incarnation of learning spaces requires additional study, since today's students spend an increasing amount of their time attending schools. On the other hand, researches on the effects of such environmental variables as light, temperature, and noise on learning have yielded some predictable results that are addressed through classroom design. Learning appears to be affected adversely by inadequate light, extreme temperatures, and loud noises—variables maintained within acceptable ranges in most school classrooms. In addition to environmental conditions and physical environment, information and communications technology and educational tools have great potential to enhance and transform instruction and should be used effectively in many Iranian public schools. Today's students should be allowed to use their devices in class to take notes, access materials and applications, and find relevant information. When all students in a classroom can access networked tools simultaneously, many collaborative learning and just-in-time teaching opportunities emerge (Graetz 2006).

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