

Research Paper

## The Spatial Attributes of Higher Education Environments According to the Coordination of Behavior and Activity Space

Case study: University of Guilan<sup>†</sup>

Sara Alijani<sup>1</sup>, Amirreza Karimiazari<sup>\*2</sup>

<sup>1</sup> Master of Architecture, Architecture and art Faculty, University of Guilan, Rasht, Iran

<sup>2</sup> Associate Professor, Architecture and art Faculty, University of Guilan, Rasht, Iran

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### Abstract

**Purpose:** Learning environments can affect education quality and lead to optimal behaviors. This research attempted to modify higher educational environments by increasing creativity, accountability, motivation, self-actualization, and interaction.

**Design/Methodology/Approach:** Quantitative and qualitative research through a descriptive-survey method are used in this study. First, the theoretical framework, including a set of environmental and human factors are extracted from published books and articles. Using Delphi method, environmental and human variables are prioritized by interviewing several architecture and psychology experts. Afterwards, a closed-ended questionnaire is distributed among students of University of Guilan who are randomly selected. Finally, with a semi-structured and an open-response interview with several architecture professors, design suggestions are proposed.

**Findings:** the impact of environmental and human factors on each other are identified and ten priorities are concluded to be the most effective on the relationship. Factors such as Private & public territories separation, Cultural Elements, Curved & combined Forms, Connections between Interior & Exterior spaces and possibility of user involvement in design process are important.

**Research Limitations/Implications:** Depending on the location, students living conditions and social culture, the findings can be different.

**ORIGINALITY/VALUE:** This topic has not been investigated in non-western countries like Iran by professionals. Thus, the context of this study and the presented findings can be deemed unique.

**Keywords:** Higher education environment, Environmental psychology, Education quality, Behavior, Physical environment.

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## 1. INTRODUCTION

Higher education buildings are designed to create and support academic-related functions. They accommodate diverse faculties with different specializations (Abisuga, Wang, & Sunindijo, 2019). These educational systems are social institutions that meet the needs of community and play an important role in the economic development of any

society and are essential for the growth and survival of each society (Asteriou & Agiomirgianakis, 2001). Universities as final stage of the educational system are challenged with fostering students who are ready to enter their work field. Higher education represents a critical factor in innovation and human capital development and plays a central role in the success and sustainability of the knowledge generation (Dill & Van Vught, 2010). Therefore, it is essential to achieve ideal educational environments that meet the quantitative and qualitative standards needed for improved educational quality in order to raise the scientific level of a country. Institutions not only must be comprehensive and sustainable, but also should be constantly evolving to meet the rapid and often unpredictable challenges of globalization.

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\*Corresponding author: Amirreza\_karimiazari@Guilan.ac.ir

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Five decades ago, Robert Sommer wrote that, "The interface between education and design has remained relatively unexplored – educators being mainly concerned with student behavior and designers with aspects of the physical environment" (Sommer, 1969). In recent years, complex efforts to link the school environment with student learning and behavioral patterns have shown an increase in media and educational research. Researches in this area has been tied to a wave of new buildings, especially new learning centers, which, by creating competition, produce a growing ideology of student-centered learning (Cox, 2011). In fact, according to the Organization for Economic Cooperation and Development (OECD), worldwide efforts to improve the quality of education are on the rise. Also, the American Architectural Foundation (AAF) believes that, "Students will be better prepared for the future if their learning venues match their learning tools. In other word, the learning process and its environment should be in harmony." Unfortunately, in the development of higher Education Environments, attention is given to quantitative dimensions rather than qualitative ones. This creates places that are built according to pre-defined standards, and design for promoting specific features among scholars is less targeted.

The purpose of this study is to extract the qualitative components in design of higher education environments, so that with the correct application of these components and design principles, there will be a coordination between education environments and student behavior (creativity, motivation, self-actualization, accountability, interaction). In other words, this article identifies specific factors in the design of higher education environments that can be used to achieve targeted environments to promote optimal student behaviors. For this purpose and in order to achieve improved higher educational quality, and according to the educational and environmental researches had been done in this field before, environmental and human factors involved in educational environments are extracted as two impressive groups. Environmental factors have been selected as independent variables and behavioral factors as dependent variable. The effect of these two variables on each other has been evaluated to provide solutions for enhancing human characteristics.

## 2. LITERATURE REVIEW

### 2.1. Definition of theoretical concepts

The OECD (2002) defines higher education as all Universities, Colleges of Technology, and other institutions of post-secondary education, regardless of their source of finance or legal status. It also includes the research institutions, experimental stations, and clinics operating under the direct control, administered by, or associated with higher education institutions. The quality in higher education, as per the definition provided by the International Network for Quality Assurance Agencies in Higher Education (INQAAHE), is roughly the same as the quality assessment activities carried out at the international level. This institution has defined the quality as the degree to which the existing status of higher education systems is

compatible with: (a) pre-defined standards; (b) mission, goals and expectations. In terms of environment and behavior, the conceptual framework of behavioral models has been set by Roger Barker, the founder of ecological psychology. Behavioral environments are considered as stable combinations of activity and environment, and, the coordination of environment and behavior is the base for the consistent relationship of those two (Lang, 1987). The behavioral concepts in this study are creativity, self-actualization, motivation, accountability and interaction. Creativity is an important component of problem-solving, healthy social and emotional well-being and scholastic and adulthood success (Plucker, Beghetto, & Dow, 2004). Also, creativity has been identified as a key educational goal and an essential skill in educational settings in 21st century (Chan & Yuen, 2014; Robinson, 2011; Wagner, 2010). Self-actualization, or flourishing, is defined as having high levels of both hedonic well-being and eudemonics well-being (Felicia A Huppert, 2009; Felicia A Huppert & T. C. So 2013; Keyes, 2002). Flourishers seem to have excellent mental and physical health and are more resilient to challenges in life than non-flourishers (Bergsma, Veenhoven, Ten Have, & de Graaf, 2011; Diener & Seligman, 2002; Felicia A Huppert, 2009; Kobau et al., 2011; Lyubomirsky, Sheldon, & Schkade, 2005; Ryff & Singer, 1998; Schotanus-Dijkstra et al., 2016; Veenhoven, 2008). According to the Nature's Journal, motivation is the driving force that elicits a certain behavior from an organism in order to satisfy the drive or seek a particular goal. Improving student learning and motivation requires attending both the structural and symbolic features in a learning environment (Cheryan, Ziegler, Plaut, & Meltzoff, 2014).

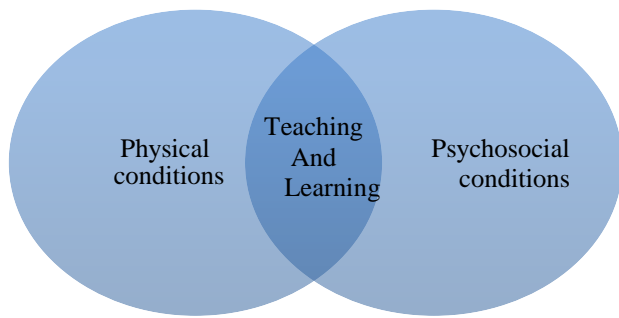
Within educational settings, student accountability is based on compliance and acceptance: adherence to what is prescribed, asked, or offered by the adults in charge (Cook-Sather, 2010). According to a report provided by Global Education Monitoring (GEM) in 2017, for students, accountability in the learning environment is an expectation to act and perform according to rules and regulations set in advance and places responsibility on their behavior.

Learning is an interactive process between the learner and the learning environment. Several types of instructional interactions, such as the learner-tutor, the learner-learner, the learner-content, and recently, the learner-interface interactions, have been identified in higher education. The design execution of these interactions may significantly influence the learning impact of an academic educational session (Mattheos, 2004).

### 2.2. Background

UNESCO (2012), the Institute for Statistics (UIS) conducted a comprehensive study on learning environments focusing on physical environment, mental condition, and organizational climate, and concluded that the environment influences the learning process in two

dimensions of physical and mental aspects. They also presented the following pattern:



**Fig 1.** Major categories of learning conditions from a holistic perspective (Bernard, 2012)

A study about School’s Physical Environment by Charles Cannes Tanner, a professor at the University of Georgia, achieved interesting results: The independent variable set for developing a possible explanation of student achievement was the school’s physical environment, defined as four sets of design patterns: movement and circulation (e.g., adequate personal space and efficient movement patterns throughout the school), large group meeting places (e.g., social gathering places), day lighting and views (e.g., windows with natural light), and instructional neighborhoods (Tanner, 2008). Physical environments vary in different educational fields. For example, natural light in classes has different effects on the level of students' learning in arts, mathematics and theoretical courses (Tanner, 2008). Clearly defined pathways, positive outdoor spaces, computers for teachers, and a positive overall impression on students' attitudes are four important factors shown to improve learning processes (Tanner, 2012). Ample space, which avoids overcrowding, can improve student outcomes. Likewise, ample circulation patterns, appropriate scale, fenestration, plenty of natural light in the classroom, links to the main entrances, appropriate and highly visible main entrance, pathways with goals, density or freedom of movement, personal space, and social distance all improve student performance (Tanner, 2014).

Sapna Cheryan and her research team in 2014 concluded that student learning is deeply affected by the

environment in which learning occurs. Improving students' learning, achievement and motivation requires attention to both structural and symbolic dimensions of classrooms. In another study by Marchand et al. (2015), the effect of light, temperature, and sound on learning process was evaluated, indicating that the effects on different listening and reading lessons were different. Also, Shernof et al. (2017) showed that the furniture of educational environment impacts the level of participation, collaboration, concentration, and student's experiential activities. In 2013, Farah Jamal and her colleagues explored the impact of insecurity and presence of out-of-control spaces in educational settings on mental health and student behavioral abnormalities. Deborah Harrop and Bea Turpin (2013) found that 9 factors contribute to create an appropriate learning environment which are: goal, identity, interaction, society, privacy, time, human factors, resources, physical and mental enhancement. Additionally, del Puerto (2011) has shown in his research that access to new resources, equipment, and technologies in learning environments can positively affect the learning process.

### 2.3. Theoretical framework

The management of educational environments is a topic that is studied by both educational institutions as well as designers in order to raise the quality of education both physically and psychologically. An environment that is introduced as a learning environment has countless physical details, many of which have been evaluated by different researches over the years. The changes that are made to improve the quality of environments are aimed to develop appropriate behavioral factors or to modify inappropriate behaviors. As a result, improving the quality of education is faced with two components: environment and behavior. In the present study, the first group, environmental factors, is identified as the independent variable. Based on previous research, 24 environmental factors have been gathered to improve the quality of education (Table 1). The second group, behavioral factors, is identified as the dependent variable; 30 behavioral factors were compiled as the product of improved educational quality studied in other researches (Table 2).

**Table 1.** Effective Environmental Factors in Improving Educational Quality (Authors)

Factors	Source
1- Equipment & Technologies	(del Puerto, 2011)
2- Appropriate Access	(Tanner, 2012)
3- Furniture	(Shernof et al, 2017)
4- Security of Spaces	(Jamal et al., 2013)
5- Green Areas	(Tanner, 2012)
6- Separation of Private & Public Territories	(Lang, 2012)
7- Appropriate Main Entrance	(Tanner, 2014)
8- Adequate Natural Light for Different Spaces	(Marchand et al., 2014)
9- Acoustics of Educational & Theoretical Spaces	(Marchand et al., 2014)
10- Visual & Aesthetic Principles	(Grutter, 2010)
11- Temperature & Ventilation	(Marchand et al., 2014)
12- Use of curved and combined forms in building design	(Grutter, 2010)
13- Instructional Neighborhood	(Tanner, 2014)
14- Clearly Defined Pathways	(Lang, 2012)

Factors	Source
15- The user involvement in design process	(Lang, 2012)
16- Consideration of Spatial Hierarchy	(Lang, 2012)
17- Space Geometry	(Grutter, 2010)
18- Connections between Interior & Exterior spaces	(Nair et al., 2009)
19- Standard Physical Dimensions	(Zavaraki & Toofaninejad, 2012)
20- Connection Ways with Outside Environment	(Nair et al., 2009)
21- Orientation of Buildings According to Location	(Zavaraki & Toofaninejad, 2012)
22- Appropriate Textures & Colors	(Nair et al., 2009)
23- Proper Location of Educational, Service, and Sanitation Stations	(Zavaraki & Toofaninejad, 2012)
24- Rich Details in Environment like Cultural Elements	(Grutter, 2010)

**Table 2.** Factors created in human due to improved educational quality (Authors)

1 Discussion (Mattheos, 2004)	16 Security (Jamal et al., 2013)
2 Correction of Behavioral Abnormalities (Jamal et al., 2013)	17 Peace (Jamal et al., 2013)
3 (Cheryan et al., 2014) Curiosity	18 Creativity (Chan & Yuen, 2014)
4 Challenge (Shernof et al, 2017)	19 Bergsma et al., 2011) (Self-actualization)
5 Saliency (Shernof et al., 2017)	20 (GEM Report, 2017) Respect
6 Discipline (GEM Report, 2017)	21 (Tanner, 2012) Learning
7 Goal clarity (Shernof et al., 2017)	22 Cooperation (Routen et al., 2018)
8 (Routen et al., 2018) Interaction	23 Enthusiasm (GEM Report, 2017)
9 Idealism (del Puerto, 2011)	24 (Cox, 2011) Identity
10 (Jamal et al., 2013) Mental health	25 Esteem (Shernof et al., 2017)
11 Fatigue decrease (UIS, 2012)	26 Competence (Shernof et al., 2017)
12 (GEM Report, 2017) Accountability	27 Affiliation (UIS, 2012)
13 Satisfaction (Keller, 2009)	28 Participation (Shernof et al., 2017)
14 Concentration (Shernof et al., 2017)	29 Reasoning (GEM Report, 2017)
15 Coherence (Shernof et al., 2017)	30 (Cheryan et al., 2014) Motivation

### 3. METHODOLOGY

A mixed method is employed in this study. This methodology is a research approach in which both quantitative and qualitative data are collected (Bowers et al., 2013). In phase one, the theoretical framework, including a set of environmental and human factors were extracted. Then, semi-structured interviews are conducted with 5 psychological experts (educational sphere) and architects. Based on the literature review and semi-structured interviews in accordance to the Delphi Method, the independent and dependent variables, used to improve the quality of education were examined and five priorities were targeted at both variables (Table 3).

**Table 3.** Priorities (Authors)

Physical Environment Variables	Individual Variables
Rich Details in Environment like Cultural Elements	Creativity
The user involvement in design process	Interaction
Use of curved and combined forms in building design	Accountability
Connections between Interior & Exterior spaces	Motivation
Separation of Private & Public Territories	Self-actualization

Based on those priorities, the following factors are provided which are used in the next step:

Separation of private and public territories, Rich details in environment like cultural elements, User involvement in shaping some spaces, Curved and combined forms, more interior and exterior connections for some spaces.

The case study is Guilan University in Rash, Iran and its students are statistical community of the research. To reach the purpose of the study, a closed-ended questionnaire with Likert Scale is arranged to identify and evaluate the effectiveness of the independent variables on the dependent variables. According to the statistical population of about 20,000 students in Guilan university, and according to Morgan's sampling table (Krejcie & Morgan, 1970), 384 students are sampled and the questionnaires are randomly distributed among students.

### RESULTS

Descriptive statistics is used to analyze the data. For this purpose, the answers of the questions are entered into SPSS22 software and statistical results are extracted and analyzed. Face validity is used to determine the validity of the questionnaire, and Cronbach's alpha for determining its reliability. Cronbach's alpha is one of the best analyzes for the reliability of research in the social and organizational sciences (Bonett & Wright, 2015). Reliability of the questionnaire is 0.963 with 32 questions. The questionnaire consisted of 2 descriptive questions for assessing the subjects and 30 questions related to

hypotheses. 6 questions were considered to evaluate each hypothesis. The reliability of each hypotheses is as follows (Cronbach's alpha):

Reliability of separation of private and public territories = 0.87

Reliability of using rich detail in the environment, such as cultural elements= 0.75

Reliability of use of curved and combined forms in building design= 0.78

Reliability of Connections between Interior & Exterior spaces = 0.85

Reliability of the user involvement in design process = 0.89

Based on two descriptive questions, most of the samples (50%) are 20-30 years old and most of the samples (37.5%) are bachelor degree students (Figure 1-2).

Examples of questions that examined research hypotheses and effect of dependent variables on independent variables in the questionnaire is as follows (Table 4):

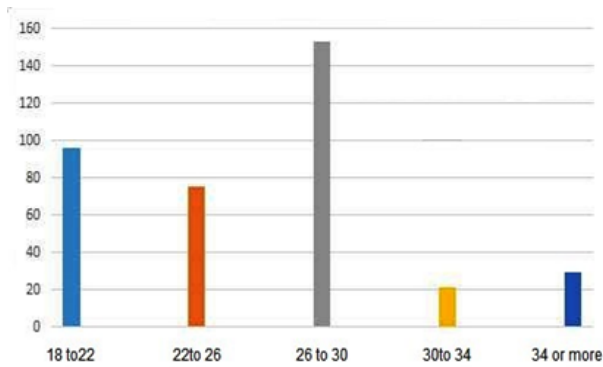


Fig 2. Frequency distribution of sample group by age

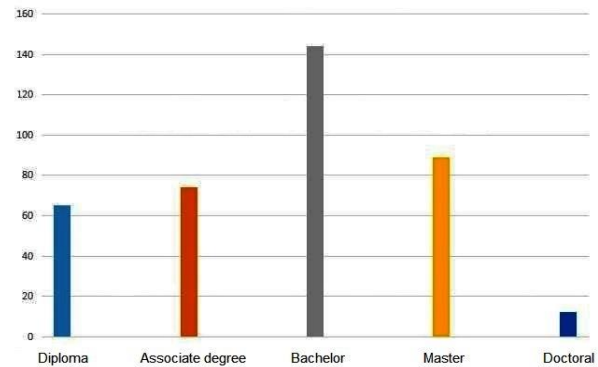


Fig 3. Frequency distribution of sample group by education

Table 4. Some questions of the questionnaire (Authors)

Questions	Completely disagree		Disagree		Neither agree nor disagree		Agree		Completely agree		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
4- How much impact does applying rich details in the environment, such as cultural elements have on students' motivations (goals of students)?	176	45.81	119	30.99	53	13.80	20	5.21	16	4.17	384	100
5- How much impact does the user involvement in design process have on students' accountability?	157	40.88	126	32.81	62	16.14	29	7.55	10	2.60	384	100
10- How much impact does the separation of private and public territories have on students' creativity?	169	44.01	138	35.94	63	16.41	10	2.60	6	1.56	384	100
16- How much impact does the use of curved and combined forms in building design have on students' interactions?	181	47.13	129	33.59	69	17.97	3	0.78	2	0.52	384	100
26- How much impact does the connections between Interior & Exterior spaces have on students' self-actualization?	171	44.53	131	34.11	56	14.58	18	4.69	8	2.08	384	100

In the next step, Chi-square test was used to analyze the research hypotheses (Table 5), which is a non-parametric tool designed to analyze differences of groups when the dependent variable is measured at a nominal level. The number of the questions related to each hypothesis is written in front of them as below:

1- Separation of private and public territories (3-10-17-22-30-32)

2- Rich details in environment like cultural elements (4-9-14-21-25-29)

3- The user involvement in design process (5-13-18-24-28-31)

4- Use of curved and combined forms in building design (6-11-16-19-23-27)

5- Connections between Interior & Exterior spaces (7-8-12-15-20-26)

The Chi-square ( $\chi^2$ ) can provide information not only on the significance of any observed differences, but also

creates detailed information on exactly which categories account for any differences found (McHugh, 2013).

Considering that each hypothesis has 6 items, the Chi-square test for items of each hypothesis is ( $p < 0.05$ ), and since the significance level of Chi-square calculated ( $p = 0.0005$ ) is smaller than the significance level of ( $p = 0.05$ ), items are statistically significant. The results also show that with the probability of 95%, the research hypotheses can be confirmed.

The effect of dependent and independent variables on each other is investigated by Friedman test in this part (Table 6) (Based on the average rating of questions and Friedman formula). This nonparametric test is used to compare three or more matched groups (Scheff, 2016). And, its aim is to test hypotheses related to ordinal-scaled data (Sheldon, Fillyaw, & Thompson, 1996).

**Table 5.** Chi-square calculation of samples (Authors)

Question number	sig	X2	df	Result	
				Approved	Rejected
3	201.938	4	0.000	✓	-
4	248.839	4	0.000	✓	-
5	205.974	4	0.000	✓	-
6	239.307	4	0.000	✓	-
7	281.924	4	0.000	✓	-
8	250.505	4	0.000	✓	-
9	284.099	4	0.000	✓	-
10	289.047	4	0.000	✓	-
11	275.792	4	0.000	✓	-
12	272.141	4	0.000	✓	-
13	289.542	4	0.000	✓	-
14	267.979	4	0.000	✓	-
15	311.339	4	0.000	✓	-
16	321.417	4	0.000	✓	-
17	167.901	4	0.000	✓	-
18	248.370	4	0.000	✓	-
19	229.203	4	0.000	✓	-
20	276.313	4	0.000	✓	-
21	220.453	4	0.000	✓	-
22	279.151	4	0.000	✓	-
23	260.245	4	0.000	✓	-
24	260.245	4	0.000	✓	-
25	234.099	4	0.000	✓	-
26	266.078	4	0.000	✓	-
27	227.927	4	0.000	✓	-
28	281.339	4	0.000	✓	-
29	285.948	4	0.000	✓	-
30	319.464	4	0.000	✓	-
31	274.229	4	0.000	✓	-
32	255.844	4	0.000	✓	-



By comparing the average score of the questionnaire ratings through Friedman test, and according to the design of the questionnaire, which evaluated the relationship between independent and dependent variables, the average score indicated that there was a great relationship between

the two variables. Table 7 shows 10 relationships with the highest average rating, the most frequent associations were from two independent variables (environmental factors) and affiliated (behavioral factors):

**Table 6.** Investigating the effect of dependent and independent variables on each other through Friedman test (Authors)

Questions	Answers	average score ratings through Friedman test
Which environmental factors have the greatest impact on student accountability?	Separation of private and public territories	19.09
	The possibility of the user involvement in design process	17
	Considering curved and combined forms in the design of buildings	16.01
	Connections between Interior & Exterior spaces	14.70
	Applying rich details in the environments such as cultural elements	14.50
Which environmental factors have the greatest impact on students' motivation?	Applying rich details in the environments such as cultural elements	15.87
	The possibility of the user involvement in design process	15.85
	Connections between Interior & Exterior spaces	15.66
	Considering curved and combined forms in the design of buildings	14.86
	Separation of private and public territories	13.90
Which environmental factors have the greatest impact on the creativity of the students?	Applying rich details in the environment, such as cultural elements	17.72
	Connections between Interior & Exterior spaces	14.98
	Considering curved and combined forms in the design of buildings	14.95
	The possibility of the user involvement in design process	14.70
	Separation of private and public territories	14.64
Which environmental factors have the greatest impact on students' self-actualization?	Separation of private and public territories	15.57
	The possibility of the user involvement in design process	15.32
	Considering curved and combined forms in the design of buildings	15.15
	Applying rich details in the environments, such as cultural elements	14.50
	Connections between Interior & Exterior spaces	14.15
Which environmental factors have the greatest impact on the interaction between students?	Applying rich details in the environments, such as cultural elements	17
	The possibility of the user involvement in design process	15.64
	Separation of private and public territories	14.80
	Connections between Interior & Exterior spaces connections for some spaces	14.70
	Considering curved and combined forms in the design of buildings	13.61

**Table 7.** relationships with the highest average rating

1	Effect of private and public territories separation on accountability
2	Effect of applying rich details in the environment, such as cultural elements on creativity
3	Effect of applying rich details in the environment, such as cultural elements, on interactions
4	Effect of users involvement in shaping some spaces on accountability
5	Effect of considering curved and combined forms in the volume of buildings on accountability
6	Effect of applying rich details in the environment, such as cultural elements on motivation
7	Effect of user involvement in shaping some spaces on motivation
8	Effect of More interior and exterior connections for some spaces on motivation
9	Effect of user's involvement in shaping some spaces on interactions.
10	Effect of private and public territories separation on self-actualization.

#### 4. DISCUSSION

The findings demonstrate that environmental factors like Separation of private and public spaces, Environmental detail design, the user involvement in design process, considering curved and combined forms in the design of buildings and interior and exterior connections can affect behavior elements such as accountability, creativity, interactions, motivation and self-actualization.

Rich details in environmental design of an educational place can have significant effect on behavioral factors which are mentioned in previous studies as well. The importance of Environmental details such as light temperature on learning process (Marchand, Nardi, Reynolds, & Pamoukov, 2014), furniture design on participation, collaboration, concentration, and experiential activities (Shernof et al., 2017) and the effect of access to new resources, equipment, and technologies of learning environments on learning process (del Puerto, 2011) and also Cultural Elements (Grutter, 2010), which can positively affect the learning environments, is undeniable. In this study, Separation of private and public spaces can increase accountability and self-actualization. Previous studies have also highlighted the significance of this factor (Harrop & Turpin, 2013; Jamal et al., 2013). Tanner (2014), emphasized on social distance that can improve student performance.

The user involvement in design process is another factor that can affect Interactions, motivation and accountability of the user. Tanner (2008), in his study indicated that social gathering places can lead to student achievement. Connections between Interior & Exterior spaces can have an impact on student motivation, which is mentioned by Nair and his colleague (2009) as well. Considering curved and combined forms in the design of buildings is another factor that influences the accountability which was mentioned in a book by Grutter (2010).

#### 5. CONCLUSION

This study was conducted as a scientific research to transform specific factors in the design of higher education environments. Achievement of a targeted environment can promote optimal student behaviors. The evidence presented here has direct policy implications. This work could be useful for developing and implementing education policy for Universities, program administrators, and teachers. Professional development programs might consider adopting the findings of this research into their curriculum. For students to learn to their full potential, scientific evidence suggests that the classroom environment must be of minimum structural quality and contain cues signaling that all students are valued learners. It was clearly shown by the result of this study that student learning and achievement is deeply affected by the environment in which this learning occurs.

Private and public territories separation was a major environmental factor affecting the students' accountability and self-actualization. Applying rich details in the environment, such as cultural elements was also shown as a major factor influencing the increase in creativity, interactions, and motivation. The user involvement in design process was the other major factor affecting the increase in accountability, interactions, and motivation. Connections between Interior & Exterior spaces also help increasing student's motivation. Considering curved and combined forms in the design of buildings was another environmental factor affecting accountability.

Finally, with a semi-structured and an open-response interview with 10 architecture professors who had teaching experiences in educational environments, three design suggestions were proposed as the most repetitive ones for each of the environmental factors (Table 8).

**Table 8.** Architectural suggestions (Authors)

Priorities	Demanded	Suggestions		
1	Private & public territories separation	Furniture & Partitions	Level Difference	Differences in Texture, Color, & light
2	Rich Details in The Environment, such as Cultural Elements	Monumental Elements in Site	Central Exhibition with Cultural Issues	Use of Native Forms & Materials
3	the user involvement in design process	Ability to Change The Dimensions of Spaces with Movable Partitions & Furniture	Walls for Posters & Photos in Educational Spaces	Mirror Surfaces for More Background Reflection
4	Curved & combined Forms in The design of Buildings	Composition of Different Faculties Volumes	Curved Shapes & Directions	Curved Shapes in The Overall Volume & the Skyline
5	Connections between Interior & Exterior spaces	Development of Indoor Green Space	Transparent, Translucent, & Opaque Spaces	Terraces & Porch as Intermediary Space



An important limitation of this research is the cultural and economic differences as well as the existence of different living conditions in different societies. Each of these factors can be effective in prioritizing environmental and behavioral factors. It seems that in future research, the impact of culture, economy and living conditions of students in different geographical areas can be examined.

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#### AUTHOR (S) BIOSKETCHES

**S. Alijani .,** M .A. in Architecture, Architecture and art Faculty, University of Guilan, Rasht, Iran  
Email: sarah-alijani@yahoo.com

**A. R. Karimiazari .,** Associate Professor, Architecture and art Faculty, University of Guilan, Rasht, Iran  
Email: amirreza\_karimiazari@guilan.ac.ir

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