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Investigating the Effective Ecological Factors on Concentration in the Classroom from the Viewpoints of Students of Shahid Sadoughi University of Medical Sciences, Yazd

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ABSTRACT

Introduction: Concentration is a definite prerequisite for learning the lessons in the classroom and education, ensures learning, and leads to academic achievement. Therefore, this study was conducted with the aim of studying the ecological factors affecting concentration in the classroom from the viewpoints of students of Shahid Sadoughi University of Medical Sciences in Yazd in the academic year 2018-2019.

Materials and Methods: This descriptive, cross-sectional study was conducted on 650 students from six faculties of Shahid Sadoughi University of Medical Sciences, from 21 April to 20 June 2018. Participants were selected by stratified random sampling. Data collection tool was a standard two-part questionnaire consisting of 29 questions about demographic characteristics and ecological factors influencing the concentration. The data were analyzed by SPSS 24 using central tendency indices, t-test and chi-squared test.

Results: In the domain of the teacher, "Teacher's skills in creating motivation" (4.21 ± 1.54), in the domain of the student, "Interest in the subject of study" (3.99 ± 1.51), and in the domain of environment, "Noise pollution in the classroom" (3.11 ± 1.33), attained the highest score among ecological factors related to concentration in the classroom. There was a significant difference in the mean score of viewpoints in the domain of environment between male and female students (P = 0.00).

Conclusion: The results showed that paying attention to the three factors motivation, interest in the subject of study and relaxation in the classroom environment, which attained the highest scores according to the students' viewpoints, is essential to the educational planning by the University's Education Deputy authorities.

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Introduction

Higher education represents a type of investment in human resources that contributes to the inclusive development of the country by providing and promoting the knowledge, skills and attitudes manpower needs. Higher education,

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therefore, plays an undeniable role in the development of societies, especially organizations [1]. Classrooms are a good place to transfer professors' experiences to students and to better understand the lessons [2, 3]. Educational ecology is one of the branches of human ecology. Educational ecology is an interdisciplinary knowledge that links the natural sciences, the social sciences, and the humanities. The mission of this knowledge is to study human beings as individuals or a social system in interacting with the multidimensional environment surrounding them by a comprehensive perspective. In terms of educational ecology, education is considered to be a facilitator of all things that lead human toward sustainable development [4, 5]. According to the main viewpoints of educational ecology, the classroom is a micro-ecological system consisting of three ecological factors, i.e., teachers, students and the classroom environment. These three ecological factors create ecological balance in the classroom system, and if any of these factors are lost or damaged, a chain reaction is created, which leads to classroom ecological imbalances and disruptions in the process and teaching and learners' learning [6, 7]. We do not have the control over the home/neighborhood environment, but we can control the environment where people spend at least one third of their time. The environment we create in our schools and universities has a great impact on the daily performance of learners [8, 9]. The concentration is an acquired state and refers to a mental state in which all the sensory and intellectual powers of a person are concentrated on a specific subject [10, 11]. Concentration in every task, including learning the lessons in the classroom, is a definite prerequisite for learning the lessons in the classroom and education, ensures learning, and leads to academic achievement. One of the most common educational problems is the lack of concentration in classrooms, seminars and conferences. Most people who are eager to attend the meeting will lose their concentration and become distracted. This is clearly visible among students [12]. In several studies, several factors that influence the concentration in the classroom have been independently reported, including drowsiness in the classroom, nutritional status, intellectual conflicts, teachers' satisfactory knowledge and information, mastery over the subject, teaching methods in the classroom, use of educational aids, lighting conditions and ventilation of the class [13]. The quality of education is one of the main concerns of higher education systems in most countries and has attracted much attention in recent years [14]. Among the universities, universities of medical sciences are of great importance in this regard because, on the one hand, most of the vast majority of their graduates work in medical and related professions, and on the other hand their profession requires that they deal with human being not a lifeless tool as a result, the health of the individual and society is the result of their activity in different professional fields [15].

Therefore, identifying the ecological factors affecting the concentration in the classroom in students provides the ground for planners to plan for improving the conditions of the classroom. Therefore, the present study aims to investigate the ecological factors affecting concentration in the classroom from the viewpoints of students at Yazd Shahid Sadoughi University of Medical Sciences.

Materials and Methods

The study population consisted of all students of the University (number: 5,400). This university has 6 faculties, consisting of health, medicine, pharmacy, dentistry, paramedics and nursing-midwifery in Yazd. Sample size was calculated at 650 based on a pilot study and taking into account the type 1 error (α) of 0.05, the test error of 60%, and the SD of 3.

$$n = \frac{(SD)^2 \times Z_1^2 - \frac{\alpha}{2}}{d^2} = 650$$

The sampling method was stratified random sampling. In this method, each faculty was

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considered as a stratum and the number of participants enrolled from each faculty was determined according to the number of all students of that faculty. Accordingly, from the Faculties of Health, Medicine, Nursing-Midwifery, Dentistry, Para medicine, and Pharmacy, respectively, 250, 125, 115, 75, 45, and 40 students were enrolled.

Data were collected by two trained interrogators within two months (from 21 April 2018 to 20 June 2018). First, the researchers provided explanations about the confidentiality of the participants' information and the voluntary nature of participation in the study to the students, and after obtaining informed consent to participate in the study from them, if they fulfilled the inclusion criteria (spending at least one semester of their studies at the University under purpose and not being guest or transferred student), we enrolled them in the study. The participants filled out the questionnaire within 10-15 minutes.

The data collection tool used in this study was a questionnaire used in other studies [13, 15, 16]. This questionnaire consists of 29 questions, divided in two sections: demographic characteristics consisting of 6 questions (gender, age, faculty, residence status, economic status, academic degree) plus 2 questions in appropriate time limit for holding the classroom session and the appropriate place of the classroom to sit, and the ecological factors affecting the concentration consisting of 21 questions related to three Domains, namely, the teacher (10 questions, the student (8 questions) and the environment (3 questions). The questions are rated on a five-point Liker scale (ineffective, very low, low, high and very high). Each question is rated on a 5-point scale (1-5), so that each respondent in the three domains related to the professor, the student and the environment can attain the scores ranging between 10 and 50, 8 and 40 and 3 and 15, respectively.

After data collection, the data were analyzed by the SPSS version 24. To this end, central tendency indices such as mean, standard deviation, frequency and frequency percentage were used.

Results

In this study, 650 students from six faculties of Shahid Sadoughi University of Medical Sciences were studied. The mean age of participants in the study was 27.26 ± 5.19 (range: 18- 42) years.

The results of the study showed that the mean (SD) scores of ecological factors related to the teacher, the student and the environment were 30.28 ± 13.09, 20.11 ± 2.03, and 7.34 ± 3.38, respectively. In the domain of the teacher, "Teacher's skills in creating motivation" (4.21 ± 1.54), in the domain of the student, "Interest in the subject of study" (3.99 ± 1.51), and in the domain of environment, "Noise pollution in the classroom" (3.11 ± 1.33), attained the highest score among ecological factors related to concentration in the classroom (Table 1).

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Table 1: Frequency distribution and mean (SD) of students' viewpoints on ecological factors effective on concentration in the classroom

Domain	Row	Question	Ineffective Number (percentage)	Very low Number (percentage)	Low Number (percentage)	High Number (percentage)	Very high Number (percentage)	Mean	SD
Factors related to the teacher	1	The teacher's skill to motivate the students	130 (20)	150 (23)	130 (20)	110 (17)	130 (20)	4.21	1.54
	2	Appropriately manage time in presenting the lesson	60 (9.23)	80 (12.30)	110 (17)	200 (30.77)	200 (30.77)	3.21	1.56
	3	Using the educational aid PowerPoint	110 (17)	130 (20)	130 (20)	130 (20)	150 (23)	3.25	1.48
	4	The large volume of lessons in one session	130 (20)	130 (20)	130 (20)	130 (20)	130 (20)	3.14	1.34
	5	The student's positive mental history of the professor	110 (17)	130 (20)	150 (23)	130 (20)	130 (20)	3.88	1.91
	6	Appropriate speed of teaching	110 (17)	150 (23)	130 (20)	130 (20)	130 (20)	3.31	1.47
	7	Monotonous voice	130 (20)	130 (20)	110 (17)	150 (23)	130 (20)	3.75	1.69
	8	The teacher's appropriately dealing with the students (the teacher's behaviors)	130 (20)	130 (20)	130 (20)	130 (20)	130 (20)	3.14	1.62
	9	The teacher's ability to make the student follow him.her	130 (20)	130 (20)	110 (17)	150 (23)	130 (20)	3.75	1.91
	10	The teacher's knowledge and information about the lesson subject	130 (20)						
Total							30.28	13.09	
Factors related to the student	11	Having appropriate food before attending the classroom session	200 (30.77)	81 (12.46)	97 (14.92)	217 (33.38)	55 (8.46)	2.57	1.36
	12	Feeling drowsy in the classroom	90 (13.84)	215 (33.07)	129 (19.84)	164 (25.23)	52 (8)	2.68	1.01
	13	Having a scientific backgrounds on the content presented	52 (8)	51 (7.84)	193 (29.70)	354 (54.46)	0 (0)	3.15	0.47

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Domain	Row	Question	Ineffective Number (percentage)	Very low Number (percentage)	Low Number (percentage)	High Number (percentage)	Very high Number (percentage)	Mean	SD
	14	Other students' concentration	119 (18.30)	129 (19.84)	53 (8.15)	297 (45.70)	52 (8)	3.09	1.23
	15	Being Interested in the subject of the lesson	223 (34.30)	159 (24.46)	163 (25.07)	53 (8.15)	52 (8)	3.99	1.51
	16	Having individual intellectual conflicts	181 (27.84)	174 (26.77)	52 (8)	243 (37.38)	0 (0)	2.77	1.24
	17	Active presence in the classroom (taking notes, asking questions, etc.)	204 (31.38)	132 (20.30)	144 (22.15)	119 (18.30)	51 (7.84)	2.20	1.13
	18	Having belief in learning the content while the teacher is teaching it	53 (8.15)	204 (31.38)	130 (20)	263 (40.46)	0 (0)	3.01	0.90
Total							20.11	2.03	
Factors related to the environment	19	Noise pollution in the classroom	231 (35.53)	104 (16)	113 (17.38)	202 (31.07)	0 (0)	3.11	1.33
	20	Appropriate lighting and ventilation of the classroom	278 (42.77)	112 (17.23)	0 (0)	95 (14.61)	165 (25.38)	2.64	1.75
	21	Large number of students in the classroom	343 (52.77)	0 (0)	76 (11.70)	132 (20.30)	99 (15.23)	2.24	1.59
Total							7.34	3.38	

Most of the participants in the study were girls (n:400). The majority of participants (n:300) were between the ages of 18-24 years old. The most frequent undergraduate degree was bachelor's degree (n:290). 250 students were studying at the School of Public Health. 300 people had moderate economic conditions and 450 people were living in the dormitory. The difference in the mean score of students' viewpoints about environmental factors between two genders was statistically significant (P = 0.00) (Table 2).

The results of Table 3 show that the most appropriate and inappropriate time limit for holding the classroom session from the student's viewpoints is 10-12 and 14-16 afternoon, with a frequency of 350 and 25 people, respectively. The most appropriate place for sitting in the classroom was reported to be the front row with a frequency of 390 people and the most inappropriate place for sitting in the classroom was reported to be the rear row was with a frequency of 10 people.

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Table 2: Frequency distribution and mean (SD) of students' viewpoints on ecological factors effective on concentration in the classroom based on demographic characteristics.

Variable	Mode	Number (percentage)	Mean ± SD		
			Teacher-related	Student-related	Environment-related
Gender	Male	250 (38.46)	11.21 ± 31.21	3.34 ± 21.30	3.64 ± 8.97
	Female	400 (61.53)	12.08 ± 30.11	3.14 ± 21.44	3.17 ± 7.11
P-value			0.61	0.84	0.00
Age	18-24	300 (46.15)	13.05 ± 30.21	2.31 ± 20.17	3.41 ± 7.33
	24-30	98 (15.07)	13.19 ± 32.57	2.07 ± 20.36	3.64 ± 7.66
	30-36	154 (23.70)	13.61 ± 29.51	2.05 ± 22.11	3.66 ± 8.64
	36-42	98 (15.07)	12.67 ± 28.21	2.63 ± 22.15	4.55 ± 7.33
P-value			0.29	0.82	0.67
Education level	Bachelor's degree	290 (44.61)	11.30 ± 30.02	3.42 ± 22.08	3.67 ± 7.16
	Master's degree-professional doctorate	180 (27.70)	12.64 ± 32.21	2.28 ± 20.66	4.60 ± 8.33
	Ph.D. and Specialty	180 (27.70)	12.37 ± 30.21	2.27 ± 21.34	3.61 ± 7.12
P-value			0.91	0.75	0.61
Faculty	Health	250 (38.46)	12.89 ± 32.18	2.47 ± 22.01	3.93 ± 6.86
	Medicine	125 (19.23)	13.12 ± 31.54	2.38 ± 22.10	3.98 ± 6.82
	Nursing-Midwifery	115 (17.69)	14.29 ± 32.25	2.42 ± 22.09	3.85 ± 6.21
	Dentistry	75 (11.53)	13.42 ± 32.30	2.23 ± 21.93	3.91 ± 8.45
	Para medicine	45 (6.92)	13.69 ± 30.13	2.09 ± 21.66	2.64 ± 7.57
	Pharmacy	40 (6.15)	13.47 ± 31.60	2.08 ± 21.60	2.50 ± 8.57
P-value			0.96	0.82	0.07
Economic status	Good	200 (30.77)	12.14 ± 31.69	2.41 ± 21.92	3.93 ± 8.01
	Moderate	300 (46.15)	13.64 ± 31.20	2.30 ± 21.91	4 ± 7.81
	Poor	150 (23.07)	12.96 ± 36.69	2.22 ± 22.18	4.06 ± 7.87
P-value			0.08	0.82	0.90
Residence	Dormitory	450 (69.23)	13.32 ± 31.68	2.30 ± 22.82	3.84 ± 7.75
	Other places	200 (30.77)	12.96 ± 32.13	2.37 ± 22.22	4.30 ± 8.20
P-value			0.77	0.12	0.34

Table 3: Frequency distribution of the most appropriate time limit for holding the classroom session and the most appropriate place of the classroom to sit.

Variable	Time	Number (percentage)	Variable	Place	Number (percentage)
Time limit of holding the classroom session	8-10	100 (15.38)	Place of sitting in the classroom	Front	390 (60)
	10-12	350 (53.84)			
	14-16	25 (3.84)		Middle	150 (23.07)
	16-18	78 (12)			
	18-20	57 (8.76)		Rear	10 (1.53)
	Ineffective	40 (6.15)		Ineffective	100 (15.38)
	Total	650 (100)		Total	650 (100)

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Discussion

The classroom is the place where the student needs the highest level of concentration. However, most of the time, due to internal and external stimuli, the student's senses are distracted and his/her concentration is disrupted [17]. The aim of this study was to investigate the ecological factors affecting concentration in the classroom from students' viewpoint in Shahid Sadoughi University of Medical Sciences, Yazd.

The mean scores of students' viewpoints about the environmental factors of concentration were significantly different between the two genders (P = 0.00). The results of Marzban et al are in agreement with the results of our study [2,16,18,19]. The results of the Galehdar's study showed that women were more sensitive to the environment than men [20], which is not consistent with the results of the present study. In many studies that assessed the relationship between perceptions of learning environment and learning outputs and outcomes, it has been shown that perceptions of learning environments could have profound effects on students' learning outputs and outcomes. Global experiences show that there is a difference between women and men in the process of perceiving the environment and its outcomes. Given this, it can be concluded that girls and boys can have different concentration under the same conditions with respect to the classroom environment. Therefore, it is necessary to pay attention to this point in the design of classrooms.

The most effective factor on concentration from the students' viewpoint in the teacher-related domain was the teacher's skill to motivate the students, which is consistent with the study of Mehralizadeh and Naderi [13, 21]. Accordingly, in the study of Marzban and Azmoudeh, the effective factors associated with the master "time management in the presentation of content" and "the usefulness of the content provided by the professor"[16, 18]. Although inheritance, environment, intelligence and enriching the educational environment and improving teaching methods are largely effective in improving the educational environment, the cornerstone of the education is the motivation. Psychologists consider motivation to be more important than intelligence. They consider motivation as the result of factors such as incentives, inner needs, curiosity, arousal, and the causes that one attributes to events and outcomes. In the classroom, the teacher plays an important role in motivating the student to learn lessons. Through art and skillful expression, and good manners in applying the lesson, the teacher can motivate and interest the student, which will encourage him.her to learn more about the subject before attending the classroom.

The most influential factor in the student's field of interest was the "interest in the subject", which was consistent with the results of the studies of Harestabadi, Fasihi and Hughes [2,15,22]. Mehralizadeh and Marzban also reported "student drowsiness" and "the scientific base and baseline skills of students toward the subject" to be the most important factors [13, 16]. Appropriately making students interested in the study subject requires paying attention to and organizing it by the curriculum. Certainly, the interest is the most important condition in creating concentration. The more you are interested in a topic, the more concentrated your thought will be. When you are interested in a subject, you focus on it yourself. You pay more attention and easily memorize, and you can recall it later. This is also true in the classroom.

Among the environmental factors affecting the concentration in the classroom, the "noise pollution in the classroom" was the most influential factor according to the students' viewpoints, which is consistent with the result of the study of Marzban [16]. In the study of Ana in Nigeria, classrooms with high voice pollution caused fatigue and lack of concentration among students [23]. The study of Xie did not show a significant relationship between students' academic achievement and classroom noise [24]. In the studies of Haresabadi, Mehralizadeh, lighting and ventilation attained the highest score among the factors related to concentration in the

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environment domain [13, 25]. Considering the harmful effects of environmental pollution and especially noise pollution on the health status and concentration of students, attention should be paid to insulating and securing classrooms at the beginning of construction and the architecture and location of universities should be taken into account. In addition, using insulated doors and windows can also control the harmful effects of noise pollution in educational settings.

The results of this study showed that from the students' viewpoints, the most appropriate place to sit to concentrate in the classroom is the front row and the best time to hold the classroom session is between 10 and 12 pm, which is consistent with the results of the studies of Marzban, Haresabadi, Mehralizadeh [13, 16, 25]. The reason for this can be that sitting in the front row of the class creates a direct relationship without any mediators between the student, the teacher and the board, but sitting in the following rows places other students' in the student's field of view. In other words, the distraction factors are minimal in front of the classroom and maximal at the end of the classroom. People have a lot of vitality in the morning, and spend these hours concentrating on educational affairs more, so management and time limit of training play a more important role in improving the quality of teaching-learning than the amount of time spent for teaching, which should be taken into account by the staff of the University's educational deputy in developing the curricula.

In this research, a questionnaire was used to survey the data, so some people may refrain from providing real responses and have an unrealistic response. Selection of cross-sectional design for this study was due to the fact that finding a cause-and-effect relationship was difficult. This research was also conducted in students of Shahid Sadoughi University of Medical Sciences in Yazd and its results cannot be generalized to students of other universities in Iran.

It is suggested that by approximately chronological planning, holding workshops of life skills and learning, survey sessions among professors and students and other education and logistics staff of the University, and gathering students' viewpoints, considering that they comprise the main clients of the educational system, effective steps can be taken to improve the students' concentration in the classroom, and ultimately the effectiveness of learning and its achievements.

Conclusion

The results of this study showed that students consider issues of motivation and interest in lesson subjects to be more important in concentrating. Therefore, teaching the lessons by an applied approach from high levels, including the Ministry of Health, to the teacher in the classroom can increase the concentration of students in the classroom and promote learning. In addition, these students reported noise pollution as being the most important environmental factor contributing to noise pollution, which should be taken into account in constructing and insulating the educational environment of Yazd University of Medical Sciences.

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Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this article.

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