Strides Dev Med Educ. 2025 May; 22(1):e1472. doi 10.22062/sdme.2025.200222.1472

Original Article

The Relationship between Academic Learning Effectiveness and the Desire for Lifelong Learning in Dental Students

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Received: 2024 July 28
Revised: 2025 March 12
Accepted: 2025 May 10
Published online: 2025 May 10

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Citation:
Amanpour S, Kalantari Khandani M, Movahedinasab H. The Relationship between Academic Learning Effectiveness and the Desire for Lifelong Learning in Dental Students. Strides Dev Med Educ. 2025 May; 22(1):e1472. doi:10.22062/sdme.2025.200222.1472

Abstract

Background: Rapid global changes in various fields have made the need for lifelong learning of students an important issue. Efficient models have been developed to predict learning effectiveness and three categories of academic factors, social/environmental and personality factors have been recognized. This study was designed to identify these factors and their relationship with students' desire for lifelong learning.

Objectives: Identify factors of learning effectiveness and measuring their relationship with students' desire for lifelong learning can provides a foundation for adjusting them to improve the learning experience.

Methods: This cross sectional descriptive-analytical research was done on the students of the Kerman School of Dentistry in 2024-2025. The tools used in this research were the College Learning Effectiveness Inventory (CLEI) questionnaire and a researcher made questionnaire for lifelong learning. Descriptive statistics were used to describe quantitative data, Pearson's correlation test was used for data analysis using SPSS 27 software.

Results: The results showed that by increasing the effectiveness of university learning, the desire for lifelong learning among the students increases ($p<0.001$, $r= 0.596$). This relationship was increasing and at an average level in all surveys related to gender, academic year, university admission condition, marital status and place of residence. There is no significant relationship between self-regulation ability and stress and anxiety, as well as between self-regulation and emotional satisfaction with education and professors ($p>0.05$). The relationship between the rests of the investigated components is significant and incremental. The strongest relationship was related to academic self-efficacy and self-management ($p<0.001$, $r=0.655$).

Conclusion: Increasing the effectiveness of students' learning can increase students' desire for lifelong learning by considering the social and individual dimensions of students, and this issue should be considered by policymakers and educational planners.

Keywords: Academic; Life-long learning; Students; Dental

Background

Rapid global changes in diverse fields have made the need for lifelong learning among students an essential and fundamental issue. The concept of lifelong learning was first officially introduced in 1971 and was later emphasized in UNESCO reports in 1972 and 1996 (1, 2). Lifelong learning has directly influenced the development and reform of educational systems, and has indirectly impressed fields such as science and technology, economics, culture, and social development (3). Lifelong learning is defined as learning that takes place throughout life. It is flexible, diverse, and accessible at various times and places. In this type of learning, there are no limitations in terms of place, time, age, or educational level (4). Lifelong learning is based on individual needs and aims to respond to the real needs of people at different stages of life (5). Expanding lifelong learning on a continuous, collaborative,

sustainable, and applicable basis poses challenges for most educational systems. Addressing these challenges constructively sometimes requires changes in the way educators teach and, consequently, in the learning styles of students, so that learning occurs more effectively (6). To achieve lifelong learning, policies need to focus on creating equal and continuous learning opportunities, flexibility in accepting returning students, and diversification of educational programs (7). Bayraki and Dinar identified five key factors: curiosity, motivation and desire to learn, access to various information resources, self-direction, and self-evaluation, all of which play a significant role in lifelong learning (8). There are also various institutional, educational, and personal barriers to lifelong learning. Institutional and educational barriers are easier to overcome than personal challenges. By changing management styles, teaching methods, and developing specific and targeted programs, institutional and educational problems can be reduced. However, addressing personal challenges requires greater effort to enhance student independence and self-direction (9).

As mentioned above, learning and academic achievement are the most challenging topics in educational psychology, and several effective models have been developed to predict it (10). Russell and Petri (11) identified factors used to measure students' strengths and weaknesses, and developed the College Learning Effectiveness Inventory (CLEI) based on these factors. Some scholars argue that 50 percent of academic performance is determined by innate talent, 10 percent by environmental factors, and the remaining 40 percent by individual variables (12). Thus, half of academic performance is influenced by factors beyond a student's natural ability, which the CLEI aims to evaluate.

Demirel in his study concluded that to achieve lifelong learning, the curriculum should emphasize skills training, fostering sustainable life values, personal growth, and self-esteem (13). Rezaian et al. in a research among medical students in Rafsanjan, showed that lifelong learning of students was relatively desirable. Girls' learning scores in this study were higher than boys' (14). In the study by Havasi et al. at Razi University, students' desire for lifelong learning was also moderate (15). In another study, Dergisi showed that engineering students tend to adopt lifelong learning approaches (16). In all of these studies, researchers examined students' desire to engage in lifelong learning and only Mashaghi et al. (17) documented its relationship with academic achievement.

In the Russell and Petri model and later revised versions, three main categories of factors affecting student learning are identified: academic factors, social/environmental factors, and personality factors (8). The present study was designed to identify these factors and measuring their relationship with students' desire for lifelong learning which can provides a foundation for adjusting them to improve the learning experience.

Objectives

Along with improving the learning experience, informed policy-making based on the expertise and knowledge of the organization's strategic resources can be achieved.

Methods

The participants of this cross sectional descriptive-analytical study was consisted of students from the Kerman dental school. The sampling method was a census, and inclusion criteria included student consent to participate in the study. Residents were not included. Of the 298 dental students, 216 (72.4%) students participated in this study. All of the responses in two questionnaires were the same, so they were excluded from the study. The questionnaires were distributed to students during the daily breaks at the college, and they were asked to fill them out carefully at home or in their dormitories. The completed questionnaires were collected the following day. Two questionnaires were used for this study.

A. College Learning Effectiveness Inventory (CLEI) Questionnaire

This questionnaire is derived from previous studies (11, 18). It evaluates six aspects of academic learning: academic self-efficacy, organization and attention in study, stress and time pressure, engagement in academic activities, emotional satisfaction, and classroom communication (11). In Moshtaghi study (19), the original questionnaire was translated from English to Persian. To ensure the accuracy of the translation and the consistency of the two English and Persian versions, the Persian translation was provided to two people fluent in Persian and English to reverse translate it back to English. Then it was translated back to Persian again. Finally, its face and content validity were determined by experts. Its construct validity and reliability were also calculated.

Construct validity of Persian translated CLEI questionnaire was evaluated via exploratory factor analysis and confirmatory factor analysis and it was reported as desirable. The reliability of this tool was reported by Cronbach's alpha coefficients for the six scales ranging between 0.66 and 0.84.

The questionnaire consists of 50 questions on a five-point Likert scale ; 14 for academic Self-efficacy, 8 for study organization, 6 for stress and Anxiety, 9 for university Activities, 7 for emotional satisfaction and 6 questions for classroom communication. Total score ranges from 50 (for all answers "I completely disagree") to 250 (for all answers "I completely agree"). Academic Self-efficacy; 14-70, Study organization; 8-40, Stress and Anxiety; 6-30, university Activities; 9-45, emotional satisfaction; 7-35, and classroom communication; 6-30.

The following scale was used to categorize the total scores from the CLEI questionnaire based on the effectiveness of academic learning:

- *Excellent (total score 200 to 250):* Indicates high effectiveness in academic learning.
- *Good (total score 150 to 199):* Indicates good effectiveness in academic learning.
- *Average (total score 100 to 149):* Indicates moderate effectiveness in academic learning.
- *Low (total score 50 to 99):* Indicates low effectiveness in academic learning.
- *Poor (total score below 50):* Indicates very low effectiveness in academic learning.

B. Lifelong Learning Orientation Questionnaire

This researcher made questionnaire measures seven dimensions: self-management, meta-learning (learning how to learn), initiative and innovation, information-gathering ability, decision-making ability, self-regulation, and self-control (20). These dimensions are assessed using 57 questions on a five-point Likert scale (completely disagree = 1 to completely agree = 5).

In Bordbar research (20), to measure the validity of the questionnaire, the correlation coefficient between the items of each scale was calculated with the total score of the corresponding scale using the item analysis method. The innovation and entrepreneurship dimension has the highest correlation coefficient (0.81) and the data collection dimension shows the lowest correlation coefficient (0.64).

To evaluate content validity, we asked 10 dental specialist to determine the appropriateness of each question. The responses to each question were calculated and the content and face validity ratios (CVR and CVI) were calculated based on the relevant formula. The score of content validity was above 0.79.

We used convergent validity and discriminant validity to evaluate the construct validity of the questionnaire. The average correlation of items in each dimension was high and significant (above 0.4) (Table1) which was the evidence for convergent validity. The results for discriminant validity also are presented in table 2.

In the Bordbar study (20), all dimensions had high and desirable reliability (Cronbach's alpha: 0.82), in other words, his study shows that the questionnaire has high internal consistency. We also examined the reliability using the test-retest method.

For this purpose, the questionnaire was completed by 25 students who had similar characteristics to the statistical population of the present study, and the scores for each person were calculated. After a two-week interval, the same students from the first round were referred again, and after completing the questionnaires, the scores were calculated and finally, the correlation coefficient between the scores of the first and second rounds as an index of test-retest reliability was obtained at a desirable value of 0.79.

Scoring of the Questionnaire

The questionnaire consists of 57 questions on a five-point Likert scale; 10 for self-management, 8 for meta-learning, 8 for initiative and Innovation, 11 for information gathering, 4 for decision-making ability, 9 for self-regulation, 7 for self-control. Total score ranges from 57 to 258. Self-management; 10-50, meta-learning; 8-40, initiative and Innovation; 8-40, information gathering; 11-55, decision-making ability; 4-20, self-regulation; 9-45, and self-control; 7-35.

- *Score between 57 and 95:* Indicates a low tendency for lifelong learning among students.
- *Score between 95 and 190:* Indicates a moderate tendency for lifelong learning among students.
- *Score higher than 190:* Indicates a high tendency for lifelong learning among students.

Data analysis was conducted using the SPSS version 27 software. For all research variables, the critical ratio of the coefficient of skewness and kurtosis was within the range of +2.58 and -2.58; therefore, all data in the present study followed a normal distribution. Descriptive statistics were employed to describe the quantitative data, while Pearson's correlation test was

used to analyze relationships between quantitative variables. The significance level was set at 0.05.

Results

The findings showed that 48.4% of the students were female, 39.3% were single, 55.6% were native, and 72.9% were non- tuition-paying students (Table 3).

In this study, 3 students (1.4%) rated the effectiveness of academic learning as low, 50 students (23.4%) as average, 146 students (68.2%) as good, and 15 students (7.0%) as excellent. Additionally, the desire for lifelong learning in 46 students (21.5%) was moderate, while it was high in 168 students (78.5%) (Table 4).

The results of the Pearson correlation test showed a significant relationship between the effectiveness of academic learning and the desire for lifelong learning (p-value < 0.05, Pearson correlation = 0.596). This relationship was direct and of moderate strength. In other words, as figure 1 illustrates, an increase in the effectiveness of academic learning leads to an increase in the desire for lifelong learning among Kerman dental students.

The results also showed a significant relationship between the effectiveness of academic learning and the desire for lifelong learning across gender, academic year, marital status, type of university admission, and residency status (P < 0.05). This relationship is positive (direct) and of moderate strength in all cases (P < 0.05) (Table 5).

The results of Pearson's correlation tests in Table 6 indicate that there is no significant relationship between self-regulation capability and stress/anxiety, nor between self-regulation and emotional satisfaction with teaching and professors (classroom communication) (p > 0.05). However, the relationship between the remaining components is significant and positive. The strongest relationship was found between academic self-efficacy and self-management (r = 0.655).

Discussion

The present study was designed to assess the relationship between the effectiveness of academic learning and the desire for lifelong learning. The results showed that the effectiveness of academic learning in 75% of the students was good or excellent. Additionally, the desire for lifelong learning was moderate in 21.5% of students and high in 78.5% of them. The relationship between the effectiveness of learning and the desire for lifelong learning was positive and incremental. Moreover, this positive relationship held true across gender, academic year, type of university admission, marital status, and residency status. The results of the study by Yap and Tan showed that awareness, gender, and level of study did not significantly affect lifelong learning, which does not align with the findings of the present study (21). Furthermore, the results revealed that as most components of learning effectiveness increased, the components of lifelong learning also improved. However, no significant relationship was found between stress and anxiety with self-regulation ability, nor between emotional satisfaction with education and professors with self-regulation ability.

Higher academic self-regulation allows individuals to better control their thoughts, emotions, and ultimately their behavior. Therefore, students with high levels of academic self-regulation tend to complete their tasks more effectively and are less likely to procrastinate. Stress, anxiety, and negative emotions, on the other hand, decrease an individual's self-regulation abilities (19).

The results showed that the strongest correlation was between academic self-efficacy and self-management. Students' self-efficacy beliefs enable them to manage their studies and make progress by trusting in their ability to succeed (14). Moreover, self-control and management play a crucial role in personal growth, goal achievement, satisfaction, competence, strengthening self-confidence, and resilience in the face of challenges, all of which are important factors in fostering a desire for lifelong learning (21). To date, no other study has examined the relationship between academic learning effectiveness and the desire for lifelong learning in students, making this study the first to investigate this relationship. Only one study conducted on students at Dezful University of Medical Sciences, found a positive relationship between the factors influencing academic learning and academic achievement (17). In a study by Rezaian et al. in Rafsanjan (14), similar to the present study, the desire for lifelong learning was rated as high, whereas in a study at Razi University in Kermanshah, this level was reported as moderate (15). The dependence of the concept of lifelong learning on various fields and the influence of cultural and educational factors has been emphasized in numerous studies (3, 22). Senior managers and policymakers must consider lifelong learning when conceptualizing, developing mechanisms, and creating operational plans for an educational system with a lifelong learning approach. At the same time, different

priorities exist globally among healthcare system officials and academic institutions regarding lifelong learning, influenced by political perspectives, public opinion, and organizational factors that shape the lifelong learning needs of healthcare professionals (23).

A report by the UNESCO Commission on Lifelong Learning in Iran indicates that creating a lifelong learning system is a political process that requires political courage, strong commitment, and a progressive spirit. It necessitates the participation of stakeholders in governance and decision-making centers, along with coordination in policy-making. The design and implementation of the program within the Ministry of Health should involve collaboration with other stakeholders, including universities (24). The foundation of lifelong learning should be a primary concern for dental schools. In alignment with this perspective, Kazu emphasizes that the success of lifelong learning depends not only on government policies but also on universities' responsibilities to teach and guide students in their research while addressing their long-term learning needs (25). From the moment students enter the university, they should be guided in learning skills and provided with educational programs that reinforce these skills. Without a structured approach in the college environment, individual professors alone cannot achieve this goal. In other words, achieving lifelong learning requires universities to develop curricula that foster lifelong learning by reviewing and enhancing their existing learning and teaching processes. Universities should design their curricula so that students can take control of their own learning and research responsibilities (17). One way to achieve these objectives is by improving students' learning effectiveness through efforts to enhance the factors of learning effectiveness. Research shows that while individuals' self-efficacy is influenced by various factors, it can be enhanced through appropriate assignments, such as project-based tasks. Additionally, employing new educational methods in universities, such as problem-based learning and collaborative learning, and using student-centered educational approaches that involve cooperation between faculty and students, creating a teamwork-oriented environment in student activities, promoting supportive clinical relationships with encouraging feedback rather than criticism, and introducing modern clinical teaching approaches can positively affect students' attitudes towards the educational environment and their participation in academic activities, ultimately improving their learning outcomes (26, 27). Moreover, assessing various aspects of learning environments can contribute to the further development of educational services and better educational programs (28). Using different study strategies, teaching stress management techniques and considering different individual and environmental factors can train independent and efficient learners who will accept the responsibility of their own learning.

Limitations: Due to the dispersion of general dentistry students in different departments, it was not easy to reach them. We tried to overcome this limitation by visiting them during break hours or after theoretical classes. On the other hand, it was not easy to convince students to fill out two questionnaires patiently.

Conclusion

According to the results of this study, increasing the effectiveness of students' learning by addressing both the social and individual dimensions can enhance various components of learning effectiveness and, in turn, increase students' desire for lifelong learning. Therefore, structures such as educational self-efficacy, teaching new study methods, employing innovative teaching approaches, and encouraging student participation in social and academic activities should be prioritized by policymakers and education planners.

Acknowledgements: We thank the students of Kerman Dental School for their participation in this study and their patience in filling out the questionnaires.

Conflict of interests: There is no conflict of interest.

Ethical approval: The study was confirmed by the Ethics Committee of the Kerman University of Medical Sciences (Code IR.KMU.REC.1401.484). All student information will remain confidential, with no names being disclosed.

Funding/Support: The authors declare no financial support.

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Table 1. Average correlation of items in each dimension of lifelong learning

Items	Average correlation items in each dimension
Self-management	0.629
Meta-learning	0.695
Initiative and Innovation	0.529
Information gathering	0.687
Decision making ability	0.516
Self-regulation	0.687
Self-control	0.603

Table 2. Correlation of dimensions of the lifelong learning questionnaire

Variable	Self-management	Meta-learning	Initiative & Innovation	Information gathering	Decision making ability	Self-regulation	Self-control
Self-management	Correlation coefficient	0.347	0.422	0.364	0.351	0.431	0.443
	p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Meta-learning	Correlation coefficient	-	0.312	0.337	0.376	0.336	0.362
	p-value		<0.001	<0.001	<0.001	<0.001	<0.001
Initiative & Innovation	Correlation coefficient	-	-	0.403	0.152	0.421	0.432
	p-value			<0.001	<0.001	<0.001	<0.001
Information gathering	Correlation coefficient	-	-	-	0.301	0.325	0.410
	p-value				<0.001	<0.001	<0.001
Decision making ability	Correlation coefficient	-	-	-	-	0.428	0.366
	p-value					<0.001	<0.001
Self-regulation	Correlation coefficient	-	-	-	-	-	0.370
	p-value						<0.001
Self-control	-	-	-	-	-	-	-

Table 3. Demographic information of the study participants

Variable	Number (Percentage)
Gender	
Female	104 (48.4)
Male	110 (51.6)
Year of Study	
First year	26 (12.1)
Second year	32 (14.9)
Third year	42 (19.7)
Fourth year	35 (16.3)
Fifth year	33 (15.4)
Sixth year	46 (21.6)
Marital Status	
Single	191 (89.3)
Married	23 (10.7)
University Admission	
Tuition-Paying	58 (27.1)
Tuition-Free	156 (72.9)
Residency Status	
Native	119 (55.6)
Non-native	95 (44.4)

Table 4. Distribution of Students' Opinions on the Studied Criteria

		Number (Percentage)
Effectiveness of Academic Learning	low learning effectiveness	3 (1.4)
	Medium learning effectiveness	50 (23.4)
	Good learning effectiveness	146 (68.2)
	Excellent learning effectiveness	15 (7.0)
	Total	214 (100)
Desire for lifelong learning	Moderate desire for lifelong learning	46 (21.5)
	High desire for lifelong learning	168 (78.5)
	Total	214 (100)

Table 5. Relationship between the effectiveness of academic learning and the desire for lifelong learning based on demographic information

Variable	Lifelong Learning	Academic Learning Effectiveness				95% CI	
		Pearson's correlation coefficient	p-value	Number	Relationship	Lower	Upper
Gender	Female	0.598	<0.001	104	Direct	0.463	0.706
	Male	0.594	<0.001	110	Direct	0.452	0.706
Academic Year	First year	0.656	<0.001	26	Direct	0.352	0.835
	Second Year	0.469	<0.001	32	Direct	0.138	0.706
	Third Year	0.726	<0.001	42	Direct	0.539	0.845
	Forth Year	0.569	<0.001	35	Direct	0.285	0.761
	Fifth Year	0.428	0.014	33	Direct	0.094	0.676
	Sixth Year	0.752	<0.001	46	Direct	0.589	0.857
Marital Status	Single	0.622	<0.001	191	Direct	0.527	0.702
	Married	0.460	0.031	23	Direct	0.047	0.738
University Admission	Tuition-Paying	0.550	<0.001	58	Direct	0.340	0.708
	Tuition-Free	0.615	<0.001	156	Direct	0.507	0.704
Residency Status	Native	0.655	<0.001	119	Direct	0.533	0.751
	Non-Native	0.524	0.031	95	Direct	0.354	0.661

CI: Confidence Intervals

Table 6. Correlation of Academic Learning Effectiveness Components and the Desire for Lifelong Learning among Kerman Dental Students

	Self-Control	Self-regulation	Decision-making ability	Information Gathering	Initiative and Innovation	Meta Learning	Self-Management
Academic Self-efficacy	0.453**	0.414**	0.425**	0.501**	0.531**	0.601**	0.655**
Study Organization	0.311**	0.227**	0.352**	0.328**	0.409**	0.447**	0.407**
Stress and Anxiety	0.151*	0.037	0.170*	0.361**	0.358**	0.263**	0.271**
University Activities	0.255**	0.324**	0.225**	0.309**	0.425**	0.236**	0.388**
Emotional Satisfaction with Teaching and Professors	0.269**	0.105	0.263**	0.395**	0.410**	0.362**	0.380**
Classroom Communication	0.277**	0.163*	0.342**	0.264**	0.370**	0.329**	0.350**

*The relationship is significant at the 0.05 level, **The relationship is significant at the 0.01 level.

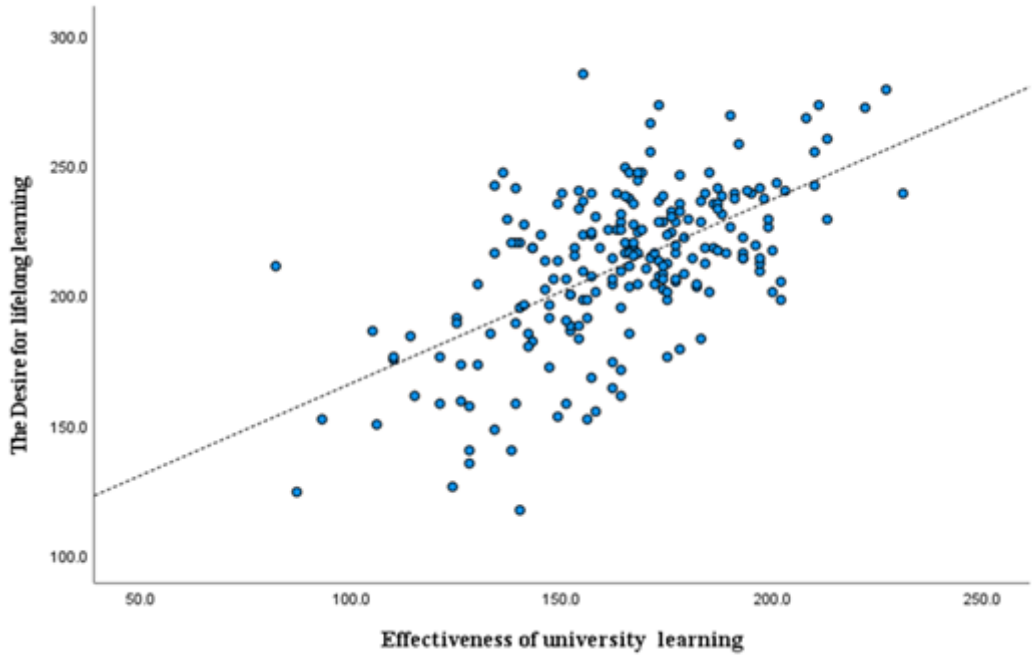

Figure 1. Distribution of the Effectiveness of Academic Learning and the Desire for Lifelong Learning