



# Correlation between the Dimensions of Constructivist Learning Environment and Self-directed Learning among the Students of Medical Sciences

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## ABSTRACT

**Aims** Self-directed learning is an essential skill to promote stable learning. The aim of this study was to investigate the correlation between the dimensions of constructivist and self-directed learning environments among the students of medical sciences.

**Instruments & Methods** The present descriptive-analytical research was conducted in 2016, using a multistage sampling among students, who studied Health, Paramedical Sciences, Nursing, and Midwifery in associate, bachelor, master, and doctoral degrees and students of Medicine and Dentistry in Kurdistan University of Medical Sciences. The 365 students were randomly classified in each school and the data were gathered by Williamson's self-directed questionnaire and Taylor *et al.*'s constructivist learning environment questionnaire. Statistical analyses were performed by SPSS 21 Software. Along with independent t-test, correlation coefficient, and one-way analysis of variance (ANOVA), Tukey's test was used as the post-hoc test.

**Findings** A significant correlation was found between the dimensions of constructivist learning environment and self-directed learning skills. There was a significant relationship between self-directed learning skills and the students' interest in their own fields of study. Also, a significant statistical relationship was found between self-directed skills and the gender of the students. In terms of the mean of the self-directed learning, there was a significant difference among the studied schools. There was a significant relationship between the schools of Nursing and Medicine, between the schools of Health and Nursing and between the schools of Medicine and Nursing.

**Conclusion** Constructivist learning environment affects the performance of students in self-directedness learning.

**Keywords** Self-Directed Learning; Constructivist Learning; Clinical Skills; Students

## CITATION LINKS

[1] Self-directed learning in a socioconstructivist learning environment [2] Understanding responsibility: A self-directed learning application of the triangle model of responsibility [3] The role of the teacher in self-directed Learning [4] Modern educational psychology [5] A constructivist perspective on monitoring classroom learning environments under transformation [6] Psychometric characteristics of constructivist learning environment questionnaire [7] A survey on relation between tendency to critical thinking and self-directed in nursing and midwifery students and its role on their academic achievement [8] Applications of social constructivist learning theories in knowledge translation for healthcare professionals: A scoping review [9] The relationship between self-directed learning and school motivation in medical students of Isfahan University of Medical Sciences [10] Self-directed learning in a socioconstructivist learning environment [11] Development and preliminary testing of a self-rating instrument to measure self-directed learning ability of nursing students [12] Effect of workshop training on self-directed learning skills of students at Shiraz University of Medical Sciences [13] Development of a self-rating scale of self-directed learning [14] Practitioner-based enquiry: Principles for postgraduate research [15] An analysis of continuing education needs of nurses in nursing homes [16] The importance of values in the constructivist theory of knowledge [17] Critical thinking disposition as it relates to academic achievement in baccalaureate nursing education [18] Applying self-directed learning strategy to enhance nursing students' critical thinking skills [19] A study on the nursing and midwifery students' trend to critical thinking and its relation with their educational status [20] Simple, surprising, useful? Three questions for judging teaching methods [21] Critical thinking in nursing education: Literature review [22] Assessment of the current situation of self-directed learning skills in medical students [23] Assessment of the educational environment at the College of Medicine of King Saud University, Riyadh

## Introduction

Self-directed learning is a process, in which the learners have a responsibility for planning, implementing, and evaluating their own learning experiences. This kind of learning makes people inner-directed and self-operating learners. The enumerated purpose could be achieved with or without the assistance of others [1, 2]. Offering the broadest definition for self-directed learning, Knowles states that "Self-directed learning describes a process, by which individuals take the initiative with or without the assistance of others in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, searching for learning strategies, and evaluating learning outcomes".

The aforementioned definition of self-directed learning by Knowles has been employed by other researchers in a variety of ways. Iwasiw outlines 5 characteristics of self-directed learning and suggests that students are responsible for identifying their own learning needs, determining their learning objectives, deciding how to evaluate learning outcomes, identifying and pursuing learning resources and strategies, and evaluating the end product of learning [3].

A social constructivist environment can create a new kind of perception and knowledge through a mutual interaction between a series of social and cognitive contexts and the other series. A social constructivist environment designs activities that are directly relevant to the use of learning in a similar culture, discourse interaction between teachers and the students, and cooperates with colleagues in non-competitive activities.

According to the constructivist outlook, the learning environment provides the learners with opportunities to effectively understand the contents through brand new experiences. In terms of this outlook, teachers are not the transmitters of knowledge. Instead, as the learners' guide, they encourage them to question, challenge, and formulate their own hypotheses, thoughts, and achievements [4].

Taylor *et al.* [5] have embarked on designing the learning environment based on the constructivist principles. In addition, they have outlined 5 characteristics for such learning environments, which include personal relevance, uncertainty, student

negotiation, shared control, and critical voice. Barzegar Bofroii and Sheakholeslami [6] argue that the aforementioned characteristics can be used in conducting studies on the perception of classroom environment.

Regarding the relationship between the inclination towards critical thinking and self-directed learning in students [7], the application of social constructivist learning theories in knowledge translation of the health care professionals [8], the role of epistemological beliefs and the perception of constructivist learning environment [6], the relationship between self-directed learning and the educational motivation of medical students [9], self-directed learning in a social constructivist learning environment [10], and a variety of researches have been done so far.

Due to the urgency for preparing the students for a lifelong learning, the theory of self-directed learning is highly considered a requirement in medical education. In student-centered approach and along with the knowledge of technology, education, and content, the students can play a significant role in educational planning [11]. The students of medical sciences are going to take some professional training courses, which need up-to-date and self-directed skills in order to succeed [12]. Accordingly, the growth and development of self-directed learning skills have become one of the main objectives of medical education in the last decades [13].

The ability to manage and set personal learning experiences are vital to succeed in medical education and other relevant disciplines. Due to the advantages of self-directed learning, both the learning environments and the universities of medical sciences have emphasized the significance of this type of learning. Furthermore, they have considered self-directed learning as one of the requirements of the 21st century [14].

Rapid changes in medical sciences have made self-directed learning one of the most significant professional competencies. That is to say, self-direction has become so highly significant for the graduates of medical sciences that even the credential standards of the aforementioned profession are trying to turn the students into self-directed individuals.

The aim of the present research was to explore the correlation between the

dimensions of constructivist and self-directed learning environments among the the students of medical sciences.

## Instruments and Methods

The present research employed a descriptive-analytical research method. The research population included both the students, who studied health, paramedical sciences, nursing, and midwifery in associate, bachelor, master, and doctoral degrees and the students of medicine and dentistry in Kursitan University of Medical Sciences. The present research was carried out in 2016, using a multistage sampling. Using stratified sampling method in the first stage, each discipline was considered one stratum and the number of samples in each stratum was selected based on the population percentage of the same stratum. In the next stage, 365 individuals were selected through simple random sampling method in the strata. Since the research was conducted in 5 schools, the samples were chosen according to the number of students in each school.

The research instrument was a questionnaire consisting of 3 sections. The first section was related to the demographic information. The second section was Williamson's self-directed learning questionnaire, which included 60 items, was categorized under 5 broad areas of self-directed learning. Twelve items are categorised under 5 broad areas of self-directed learning, namely, awareness, learning strategies, learning activities, evaluation, and interpersonal skills. The formal validity of self-directed questionnaire in learning has been confirmed by a panel of experts. Assessing the reliability of the research, Cronbach's coefficient alpha was 0.90 for the whole questionnaire, 0.77 for awareness subscales, 0.87 for learning

activities, 0.80 for evaluation, and 0.89 for interpersonal skills [13].

The third section was Taylor's Constructivist Learning Environment Survey. This survey measures the students' perception of the classroom environment in 5 subscales, including personal relevance, shared control, critical voice, student negotiation, and uncertainty. Each of these subscales is comprised of 6 items. Cronbach's coefficient alpha ranged from 0.70 to 0.89 for the questionnaire's subscale [4]. In order to calculate each scale in these questionnaires, the scores of each subscale items should be summed.

Data collection was performed by trained questioners in different schools of the university. After introducing themselves and offering a brief explanation on the objectives of the research, the trained questioners managed to achieve students' agreement to participate in the research. In addition, the questioners ensured the confidentiality and the privacy of the student's information. Finally, the questionnaires were given to the study population in appropriate time and places such as classrooms, dormitories, and libraries. Statistical analyses were performed by SPSS 21 software. Along with independent t-test, Pearson correlation coefficient, and one-way analysis of variance (ANOVA), Tukey's test was used as the post-hoc test.

## Findings

Among the 365 students, 44.4% and 55.6% were male and female, respectively. The samples were selected from Nursing, Health, Dentistry, Medicine, and Paramedical schools with the rates of 32.9%, 18.4%, 6.8%, 18.4%, and 23.6%, respectively. The mean age of students was 21.66±2.49 years old (mostly ranged 19-23 years).

**Table 1)** Correlation between the dimensions of constructivist learning environment and self-directed learning skills

The Dimensions of Constructivist Environment	Mean±SD	Personal Relevance		Uncertainty		Critical Voice		Shared Control		Student Negotiation	
		r	P	r	P	r	p	r	P	r	p
		18.54±5.06		18.59±4.22		18.51±4.63		17.38±4.56		18.73±4.56	
<b>Self-directed Learning Skills</b>	-										
<b>Self- awareness</b>	44.92±6.51	0.16	0.003	0.15	0.004	0.21	0.001	0.14	0.006	0.17	0.001
<b>Learning Strategies</b>	44.64±6.70	0.20	<0.001	0.22	<0.001	0.27	<0.001	0.19	<0.001	0.23	<0.001
<b>Learning Activities</b>	45.32±6.82	0.16	<0.001	0.17	0.001	0.20	<0.001	0.18	0.001	0.14	0.007
<b>Evaluation</b>	44.59±6.76	0.15	0.004	0.10	0.05	0.13	0.01	0.16	0.003	0.11	0.04
<b>Interpersonal Skill</b>	44.72±6.97	0.16	0.002	0.14	0.007	0.18	<0.001	0.15	0.005	0.13	0.01

81.0% of students were interested in their own fields of study. The students of the school of Health had the lowest interest (70.1%), whereas the students of the school of Dentistry had the highest interest (96.0%). Generally, 63.0% of the students were in dormitory and 37.0% lived at home (Table 1). A significant correlation was found between

the dimensions of constructivist learning environment and self-directed learning skills. There was a significant difference among study fields regarding mean scores of all self-directed learning components. No statistical significant difference between males and females in self-directed learning components (Table 2).

**Table 2)** Mean (standard deviation) of self-directed learning components according to demographic variables

Variables	Number	Awareness	Learning Strategy	Learning Activity	Evaluation	Interpersonal Skill	Self-Directed Learning
<b>Gender</b>							
Boy	162	44.97±6.78	44.03±6.52	44.80±7.24	44.41±7.09	44.44±7.10	222.75±29.99
Girl	203	44.89±6.31	45.13±6.81	45.73±6.45	44.73±6.50	44.95±6.90	225.71±28.22
Significance	-	0.9	0.2	0.2	0.7	0.5	0.3
<b>Field of Study</b>							
Health	67	45.33±6.73	45.83±6.60	45.97±6.93	45.62±6.77	46.35±6.92	229.12±29.53
Paramedical	86	45.01±6.60	44.23±7.09	45.10±6.94	44.23±6.91	43.93±7.31	222.51±30.01
Nursing	120	43.40±6.94	43.21±6.66	43.58±6.45	42.82±6.68	42.72±6.89	216.40±28.45
Medicine	67	46.45±5.13	46.25±5.99	47.43±6.41	46.52±5.87	46.75±5.96	233.11±25.03
Dentistry	25	46.80±5.56	45.40±6.24	46.88±7.13	46.28±7.06	47.24±5.97	232.60±27.77
Significance	-	0.01	0.01	0.003	0.002	<0.001	0.001
<b>Residence</b>							
Dormitory	230	44.48±6.89	44.13±7.12	44.90±7.14	44.16±6.80	44.27±7.40	222.06±30.72
Home	135	45.68±5.74	45.51±5.83	46.04±6.19	45.32±6.67	45.50±6.12	228.40±25.47
Significance	-	0.09	0.05	0.1	0.1	0.09	0.03
<b>Interested in the Field of Study</b>							
Yes	297	45.27±6.61	44.95±6.77	45.77±6.64	44.83±6.76	45.05±6.75	226.12±28.87
No	68	43.36±5.91	43.37±6.28	43.30±7.33	43.53±6.79	43.38±7.81	216.84±28.88
Significance	-	0.03	0.06	0.008	0.2	0.08	0.01

The difference between Medicine and Nursing schools was statistically significant ( $p < 0.001$ ). Also there was a significant difference between the schools of Health and Nursing ( $p = 0.03$ ). Only in terms of study field

(schools), mean scores of some components such as personal relevance, critical voice, negotiation, uncertainty and total scores of constructivist learning environment was statistically significant (Table 3).

**Table 3)** Mean (standard deviation) of the components of constructivist learning environment according to demographic variables

Variable	Number	Personal Relevance	Shared Control	Critical Voice	Negotiation	Uncertainty	Constructivist Learning Environment
<b>Gender</b>							
Boy	162	18.46±5.99	17.25±4.59	18.45±4.50	18.43±4.72	18.56±4.34	91.07±19.79
Girl	203	18.61±4.20	17.49±4.55	18.56±4.74	18.96±4.41	18.62±4.12	92.04±17.95
Significance	-	0.8	0.8	0.8	0.6	0.3	0.6
<b>Field of Study</b>							
Health	67	20.25±3.67	17.89±4.74	19.81±4.84	20.28±4.47	20.06±3.35	97.97±16.14
Paramedical	86	18.07±4.29	17.88±4.53	18.86±4.32	18.51±3.89	18.41±4.40	91.73±17.98
Nursing	120	18.09±3.78	16.98±4.38	17.99±4.76	18.52±4.81	18.31±4.45	89.60±18.24
Medicine	67	17.19±4.92	16.99±4.69	17.58±4.46	17.99±4.68	18.18±4.10	87.93±20.32
Dentistry	25	21.36±11.20	17.28±4.75	18.96±4.35	18.28±4.67	18.64±4.24	94.52±22.62
Significance	-	<0.001	0.5	0.04	0.03	0.03	0.01
<b>Residence</b>							
Dormitory	230	18.48±5.49	17.34±4.39	18.24±4.58	18.50±4.56	18.44±4.30	90.93±18.89
Home	135	18.66±4.24	17.54±4.86	18.66±4.47	19.11±4.54	18.84±4.07	92.73±18.60
Significance	-	0.7	0.8	0.6	0.2	0.4	0.4
<b>Interested in the Field of Study</b>							
Yes	297	18.76±5.29	17.55±4.63	18.65±4.64	18.81±4.51	18.69±4.20	92.37±19.00
NO	68	17.65±3.78	16.58±4.46	17.92±4.63	18.53±4.62	18.20±4.32	88.50±17.30
Significance	-	0.1	0.1	0.2	0.6	0.4	0.1

## Discussion

Due to a significant direct relationship between the dimensions of examined students' personal relevance in constructivist learning and self-directed learning environments, the correlation between the dimensions of academic science and the learner's experiences beyond the sphere of university could be measured. Accordingly, the educators should consider learners' daily experiences as an important background to develop their scientific knowledge. The present research aimed at investigating the correlation between the dimensions of constructivist learning environment and self-directed learning among the students of Kurdistan University of Medical Sciences. However, no direct comparison has been made in this case so far.

In terms of Bye's research, the need to acquire communication skills such as self-presentation skills, familiarity with others (appropriate sociability), persuasion skills, leadership skills, technical writing skills, public speaking skills, and group discussion skills have been identified as exogenous effective factors in learning [15]. It could be asserted that the students, who have active interactions beyond the sphere of university and spend a part of their time on non-academic study, will probably have a higher level of self-directed learning ability.

Although regarding a direct significant relationship between the uncertainty of constructivist learning environment and self-directed learning of the examined students, no study has been offered so far, most of the studies relevant to constructivism have discussed constructivist concepts between teachers or the impact of constructivism on the process of teaching and the students' learning. In this regard, Haydarzadegan *et al.* emphasized both the importance and the necessity to consider constructivist theory, was in line with the present research [16].

Regarding the existence of a significant relationship between self-directed learning and the inclination towards critical thinking with academic success, the studies conducted by Redding [17], Pakmehr and Mirdoraghi [18], and Ranjbar and Esmaili [19] demonstrated a positive relationship between self-directed learning subscales and critical thinking. The results of the aforementioned research

studies are in line with the present research. The teacher-centered methods of teaching not only do not suffice the development of critical thinking, but also increase the students' dependency on their teachers. Therefore, professors have to reconsider their teaching methods and apply active teaching methods to develop this kind of thinking in students and use it for medical development [20].

Simpson and Cowtney emphasized the necessity of critical thinking in nursing so that the nurses will be able to respond to rapid changes in health care environments. That is to say, the nurses must be able to think critically in order to be able to provide effective care and prepare themselves for the acceptance of roles and responsibilities in the current issues of health care systems [21].

In their opinion, critical thinking is not only important in clinical issues, but also as one of the components of nursing educational programs promotes critical thinking abilities of the nurses [21]. The direct significant correlation between the dimensions of students' constructivist learning environment and self-directed learning showed that the teaching methods of the teachers provide the learners with an opportunity to explain their thoughts to other learners. Furthermore, the learners can judge such thoughts and listen carefully to other learners and reflect on their usefulness.

The findings of this section were in line with the results carried out by Arabshahi and Naeimi [22] and Al Ayed and Sheik [23], who investigated universities that had used less modern educational methods. The findings of the present research showed a significant relationship between self-directed learning components and the dimensions of the constructivist learning environment ( $p < 0.05$ ). A significant statistical relationship was observed between self-directed learning and the interest in the students' fields of study ( $p < 0.01$ ). Comparing those students who were interested in their own fields of study with those who were not, the former had a higher mean of self-directed skills. The mean of the total score of self-directed learning is  $224.39 \pm 29.02$ .

In a constructivist environment, the students could be trained for learning clinical skills and offering both patient-centered care and

community based care. The new graduates are often inefficient in dealing with patient problems and life-threatening situations. They have limited clinical decision-making abilities and the hospitals are not equipped enough to train them. As a result, conflicting activities may have undesirable consequences for the patients. This problem is the major concern for the managers of health and care centers. Accordingly, the students of medical professions should be trained very well in order to be able to make clinical decisions and have self-directed skills in clinical situations. It is suggested that professors and educators direct educational objectives towards student-centered approaches (rather than teacher-centered ones). Professors and educators can pave the way for the students' self-directed readiness by providing them with cognitive and metacognitive packs as well as other tools. It could be also suggested that studies like this be carried out in other fields of studies in human sciences and the researchers measure another effective factors on self-directed learning and the two pre-organising and conceptual map variables.

## Conclusion

Constructivist learning environment affects the performance of students in self-directedness learning.

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**Ethical permissions:** This study was approved by the Ethics Committee of Kurdistan university of medical sciences. (1394/368).

**Conflict of interests:** There are no conflicts of interest to report.

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