

# Students' perception of effective learning experiences at an Iranian dental school: A qualitative study using the critical incident technique

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## Article info

### Article History:

Received: 3 March 2020  
Accepted: 4 April 2020  
ePublished: 9 November 2021

### Keywords:

Effective learning  
Dentistry  
Education  
Critical incident

## Abstract

**Background:** Dental students need to learn effectively to promote their professional services as a part of their daily activities. This study is conducted to determine dentistry students' experiences of factors that influence their learning.

**Methods:** This qualitative study was conducted using the critical incident technique and content analysis approach to examine dental students' experiences with factors that influence an effective learning process. Data were collected by individual in-depth semi-structured interviews with dental students at the Kurdistan University of Medical Sciences.

**Results:** In all, 104 primary codes were obtained from the interviews and group discussions, classified into two major themes. The factors facilitating effective learning encompassed three categories: teacher-related perceived experiences (8 subcategories), learning-related perceived experiences (5 subcategories), and compelling student-related perceived experiences (3 subcategories). Two factors inhibited learning: practical teacher-related perceived experiences (3 subcategories) and learning-related perceived experiences (3 subcategories).

**Conclusion:** The results showed that several instructor characteristics, such as being experienced in teaching methods, having the required clinical skills, and "interacting with students and patients" lead to effective learning. Several other factors involved in the learning process, such as student characteristics, a comprehensive curriculum fitting the theoretical and clinical needs of this field, interacting with peers, and keeping calm and being focused are some of the most critical factors involved in effective learning.

## Introduction

Dental education is a dynamic, complex, and stressful process as there is a mixture of engineering and medicine sciences in this branch.<sup>1</sup> So, neglecting this complexity can inhibit reaching educational goals, with making school facilities' useless for students, and wasting all the teachers' efforts. Although educational institutions consider many parameters required for a successful education, sometimes teaching and learning processes undergo severe stresses and break down.<sup>2</sup> Therefore, it is necessary to consider barriers and problems that inhibit learning. Dental students need effective learning to promote medical services as a part of their daily activity. They deal with a large volume of information during their education, from material sciences to life sciences, and need appropriate strategies to organize this information for their learning needs.<sup>3</sup>

Students' perspectives about their educational

experience are a beneficial source for curriculum evaluation. Although surveys are often used to collect such data, such as the studies conducted by Nami et al,<sup>4</sup> Kalbasi et al<sup>3</sup> and Zahedi & Amirmaleki Tabrizi,<sup>1</sup> the results of these studies are not always related to the learners' lived experiences,<sup>5</sup> and are thus not always as useful for curricular improvement. Such studies cannot document and interpret students' experiences and reflections about dental education in their own words.<sup>6</sup> However, few qualitative studies have been conducted to investigate dental students' perceptions about effective learning experiences.<sup>7</sup> Therefore, conducting qualitative research can help gain a deeper understanding of the factors affecting the active learning process. Victoroff and Hogan investigated the characteristics of an effective learning experience in the dental faculty using the critical incident technique.<sup>8</sup> Mofidi et al<sup>6</sup> used reflective articles written monthly by participants. The current study aimed

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to find and describe the effective learning characteristics of dental faculty using a qualitative approach. The data derived from these studies are based on participants' actual behavior and can help predict future behaviors in similar conditions, hence improving our understanding of practical teaching concepts and community-based experiences in the dentistry discipline. However, there have been no qualitative studies conducted in Iran's dental schools to evaluate the quality of education. Therefore, this study was carried out to investigate the students' perception of effective learning in this country for the first time.

### Materials and Methods

This qualitative study aimed to explain dental students' perceptions of effective learning experiences in the Sanandaj dental school using the critical incident technique. Participants consisted of 18 final-year general dentistry students who were interviewed over two months. The research was conducted at the dental school and dental clinic of the Kurdistan University of Medical Sciences. These venues were selected because of the feeling of being in a natural educational environment, more opportunities for interviews, participants' feelings of relaxation, and thus increased quality, depth, and richness of research findings.

After providing participants with a brief explanation of the research objectives, face-to-face interviews were conducted. After providing a short description of the active learning process, interviews began with open-ended questions based on the research question. For example,

participants were asked to think about a specific effective learning incident at the faculty and describe it in detail; their description could include their role in the incident, the things they thought about in the incident, their feelings, and the outcome of the incident. The participants were given enough time to think about their responses to the questions. There were 18 individual in-depth semi-structured interviews. The interview lasted one to one-and-a-half hours, depending on the conditions and trend of the interview. The interviews were recorded using a cell phone app, and each interview was given a code. The interviews were then transcribed. Data saturation was reached with the 18 interviews, but data collection and analysis continued until the categories were completed. Data analysis was conducted using conventional content analysis. The transcripts were extracted, grouped, coded, and categorized by MAXQDA software, and the final results were organized after group discussion sessions with authors.

To ensure the accuracy and reliability of qualitative data obtained, acceptability, reliability, and verifiability parameters were applied.<sup>9</sup> All ethical considerations were considered for the confidentiality of the participants' identity, such as analyzing written texts and eliminating audio files.

### Results

From the interviews and group discussions, 104 primary codes were extracted, classified into two major themes (Table 1): factors facilitating learning and those inhibiting learning. The factors facilitating learning included three

**Table 1.** Overview of themes, categories, and subcategories of learning experiences

Theme	Category	Subcategory
Factors facilitating learning	Effective teacher-related perceived experiences	Effective interaction with students and continuous monitoring and supervision
		Providing the students with the opportunity to observe complicated cases to gain experience
		Getting students involved in practical cases
		Proficiency in teaching skills
		Problem-solving abilities
	Effective learning-related perceived experiences	Allowing students to work independently
		Stress control skills
		Respectfulness
		Practical teaching of fundamental sciences and theoretical courses
		Focus on skill training
Effective student-related perceived experiences	Analyzing clinical cases and providing effective feedback	
	Organization of courses	
	Focus on practical syllabi and reduction of non-practical courses	
	Peer interaction	
	Effective interaction with patients	
Factors inhibiting learning	Teacher-related perceived experiences	Maintaining concentration
		Maintaining calmness
		Absence of teachers in the wards
	Learning-related perceived experiences	Student humiliation in the event of a mistake
		Unfamiliarity with effective teaching methods
		Insufficient attention to patient management education
		Disorganization in the content of courses
		Focus on non-practical fundamental science courses

categories: effective teacher-related perceived experiences (8 subcategories), effective learning-related perceived experiences (5 categories), and effective student-related perceived experiences (3 subcategories). The factors inhibiting learning fell into two categories: teacher-related perceived experiences (3 subcategories) and learning-related perceived experiences (3 subcategories).

### ***Factors facilitating learning***

#### ***Effective teacher-related perceived experiences***

##### ***(a) Effective interaction with students and continuous monitoring and supervision***

This includes the instructor checking the treatment stages step by step, explaining each step briefly when necessary, and the instructor's active presence in the clinical ward so that students can access them in the event of any problem or need and receive help. For example, one participant noted, "Some teachers pay attention and supervise the students completely; this continuous involvement is beneficial for our error-free learning".

##### ***(b) Providing the students with the opportunity to observe complicated cases to gain experience***

Observing complicated and specialized treatments enhances students' motivation and interest. This helps establish a comprehensive mindset for selecting a specialty field for further education aligned with their interests and capabilities. One of the participants reported, "When a student observes a surgical biopsy or a crown lengthening procedure, he/she gains experience although he/she does not do anything".

##### ***(c) Getting students involved in practical cases***

Having the instructor engage the students, which can be done by their positive thinking, encouragement, and increased self-confidence, has a positive effect on the learning process. The participants reported that these play a vital role, especially in challenging cases. For example, one participant said, "My teacher told me you extract the tooth, [and] if the root is fractured, do not worry. I am here to teach you, so that you can handle a fractured root in your office".

##### ***(d) Proficiency in teaching skills***

The participants reported that providing an overview of the course was helpful for learning, and helped them to see the big picture. One of the participants noted, "When the teacher provides an overview of the course, we know [that] what we study is used for what purpose later on, [so] understanding the lesson is easier. For example, when you learn root canal treatment, you understand the details more easily when you know about the purpose of root canal enlargement in the next step".

##### ***(e) Problem-solving abilities***

The participants noted that the instructor's creativity in

problem-solving improved their creativity and enhanced their ability to find solutions for critical incidents, leading to effective learning. One of the participants said, "If teachers show creativity, it will transfer to students and makes them creative. For instance, once I wanted to extract a tooth, I could not do it by forceps and elevators. When the teacher came, he extracted the tooth by an endodontic file which is not commonly used for tooth extraction".

##### ***(f) Allowing students to work independently***

Allowing students to work independently, especially in the last year of education, allows them to freely apply the theoretical knowledge they have learned in clinical settings and promotes effective learning. One of the participants said, "Some wards assigned responsibilities to us in the last year. For example, we only gave confirmation for a tooth we wanted to extract in the surgery ward, and teachers only saw the extracted tooth after the procedure. They only visited the patient if we faced problems during the procedure".

##### ***(g) Stress control skills***

The participants reported that teaching stress management played a vital role in treating all patients. Doing their work without stress enhanced educational efficiency, improved the quality of learning, and eventually resulted in more efficient learning. A participant noted, "In the pediatric ward, we were taught how to deal with a non-cooperative child, control our anger or not get worried, and continue the treatment calmly, which is the most important part of pediatric treatment".

##### ***(h) Respectfulness***

The interviews showed that students believed they could ask their questions more comfortably and learn more effectively if their teachers showed respectful and compassionate behavior. For example, a participant reported, "Teachers should behave so that you can tell them 'I have made this mistake,' and ask how I should deal with it. I believe teachers should have realistic expectations, i.e., they should put themselves in the shoes of students".

#### ***Effective learning-related perceived experiences***

##### ***(a) Practical teaching of fundamental sciences and theoretical courses***

The participants believed learning was more comfortable and effective if basic science and theoretical courses were consistent with various dentistry topics. Their education should not merely be theoretical, and objective observation of these topics should be provided with various teaching aids. In this regard, a participant said, "I wish a teacher would have some ideas about dentistry when he/she teaches us anatomy or biochemistry, knew which muscle was more critical for us [to know]".

***(b) Focus on skill training***

When students focus more on the quality of their work and pay less attention to the amount of work done to pass a course, they achieve the required skills more quickly and retain their knowledge better. For example, one participant reported, “In some wards, the requirements are unreasonably high that you always have to worry about it. I think it is better to pay more attention to the quality of work because dentistry is, after all, a skill, and when you learn a thing well, your speed increases gradually”.

***(c) Analyzing clinical cases and providing effective feedback***

Instructors who provide an analysis of each clinical case leads to better understanding and recognition of factors involved in these cases. For instance, a participant said, “Once I was extracting a tooth whose root was fractured, and the teacher came and said, ‘You should use an elevator for extraction of tooth 4.’ I have always remembered this statement of my teacher”.

***(d) Organization of courses***

The participants believed that providing a well-organized curriculum increases their concentration in studying the practical topics of dentistry. One of the participants noted, “We have previously studied courses such as Islamic thoughts, Islamic resolution, history of Islam. If there is something important, we have already learned it in high school. There is no need to repeat it here. On the other hand, they do not teach us [about] the dental implants, which I think is necessary for every dentist to know, or Oral Medicine has seven academic units. These materials are so abundant that 95% of them are impractical and confuse the students”.

***(e) Peer interaction***

Peer interaction means situations should be provided so that students can share their theoretical information and clinical experiences with each other. One of the participants said, “Once one of the senior students was extracting a tooth, and I was watching him. I learned many things from him, such as wrist movement during tooth extraction”.

***Effective student-related perceived experiences******(a) Effective interaction with patients***

The participants believed their effective interaction with patients positively affected both learning factors and patient-doctor satisfaction with the treatment and the quality of therapy. One of the participants said, “I feel when I learned how to deal with patients, everything became easier for me, things were going better, and teachers, patients, and I were happier than before”.

***(b) Maintaining concentration***

The participants noted that one of the most critical factors in facilitating the learning process was student

concentration. One of the participants said, “You should do most dental procedures with high concentration, such as endodontic treatment, in which we are dealing with millimeters. You learn this concentration during work over time”.

***(c) Maintaining calmness***

It can be argued that this factor is influenced by various factors such as the culture of the educational environment, their semester in school, and the student’s age. However, the participants believed that the most important factors affecting this skill were student-related factors. One of the participants said, “In the early days, I lost my temper when a patient was late or did not show up. Later, I found out that this may make things worse and make that day a useless day for me. However, in the last years of my education, when we had less stress and were under less pressure, having peace of mind helped me use the faculty educational facilities such as pre-clinic, therefore, my time was not wasted”.

**Factors inhibiting learning*****Teacher-related perceived experiences******(a) Absence of teachers in the wards***

The absence of teachers in the wards made scientific training insufficient. One of the participants reported, “I remember the first day when we went to the prosthodontics laboratory, nobody was there to teach us, and we learned through trial and error”.

***(b) Student humiliation in the event of a mistake***

The participants believed student humiliation in the event of an error reduced the educational efficiency. One participant said, “Being strict with students makes them acquire skills and learn something, which is a good thing, but humiliating them makes them disappointed and discouraged; therefore, it has a negative educational effect”.

***(c) Unfamiliarity with effective teaching methods***

The participants believed that some instructors’ lack of understanding of effective teaching methods was a factor that inhibited their learning. One of them said, “Unfortunately, some teachers did not follow a principled and scientific teaching method. One of our teachers did not choose any special resource for the course, and we jumped from one book to another. In the end, we did not have a specific reference, and the materials presented were not understandable for us”.

***Learning-related perceived experiences******(a) Insufficient attention to patient management education***

Insufficient teaching of crisis management and confrontation over critical incidents reduces students’ self-confidence, and as a stressor, disrupts their concentration and learning. For example, a participant said, “We are not taught what to do or what to say when a patient



complains in our office, or what to do if an incident occurs during treatment which is a distress for all of us who are inexperienced”.

#### *(b) Disorganization in the content of courses*

Disorganized content of some courses inhibits the acquisition of sufficient clinical experience and therefore causes ineffective education. One of the participants said, “In some wards like periodontics, too much attention was paid to the manual files, those files were so bulky that took much time and did not let us visit a sufficient number of patients, and in practical periodontics 2 and 3 courses we did the same work, and this course did not add anything to our knowledge”.

#### *(c) Focus on non-practical fundamental science courses*

Focus on non-practical fundamental science courses was one of the themes extracted for the factors inhibiting learning. A participant stated, “I feel our first two years were useless, and the basic science courses we passed were forgotten, had no application in the treatment for us, and merely took our energy and discouraged us”.

### **Discussion**

The similarities of the themes extracted in Talaei and Hekmatpou's study,<sup>10</sup> with the categories of practical experiences related to the teaching, student, and teacher as well as other subcategories extracted in the current study, were noticeable.

Victoroff and Hogan noted that teacher characteristics for achieving effective teaching included positive and friendly personality and concentrated interaction with students,<sup>8</sup> which were in line with the themes obtained in the current study, including “effective interaction with students and continuous monitoring and supervision” and “adherence to human values and respect for students”.

According to Abedini et al, a teacher's eloquence, kindness, and teaching proficiency were the most important criteria of a good teacher.<sup>11</sup> Further, Moezi et al concluded that a teacher's scientific competence was students' top priority, followed by teaching methods and ethical considerations, which aligns with the current study results.<sup>12</sup> These concepts were also aligned with subcategories such as proficiency in teaching skills, commitment to human values and respect for students, and continuous monitoring and supervision obtained in the present study.

Ansari Moghadam et al found that students believed their capabilities in achieving educational objectives in periodontology and restorative courses were not favorable.<sup>11</sup> These results are similar to the subcategory of ineffective content organization of courses. These may indicate that some modifications must be implemented in practical teaching and content organization in the periodontics course.

Khami et al concluded that dental students believed their

general dentistry program did not include appropriate content and teaching methods. They also thought that introductory science courses were exorbitant and they did not provide adequate training on practical topics such as maintaining dental equipment or the surgery of complicated impacted wisdom teeth.<sup>13</sup> These results align with the themes “focus on on-practical basic science courses” and “focus on practical topics” extracted in the present study, indicating an area for revision in the general dentistry curriculum.

In a study on the role of students' personality traits in learning, Nami et al concluded that extroversion and agreeableness were among the most significant personality traits involved in improving education.<sup>4</sup> These two traits have a critical role in student-patient interaction, which was one of the factors facilitating learning in the current study. Moreover, most previous studies have not considered the student-related factors in the learning process, confirming the failure to extract student-related topics in the inhibiting factors in learning in the present study and indicating students' attitude toward their passive role in the learning and teaching process. Based on this study's results, further qualitative and quantitative studies are indicated in dental education at different dental faculties and countries among dental students and graduates. Further, curriculum developers are suggested to consider the existing results and apply effective learning methods.

### **Conclusion**

The findings of this study showed the most critical factors involved in effective learning from the students' perspective. These consisted of instructor features such as proficiency in teaching skills, required clinical skills, and interaction with students and patients, and presentation of a comprehensive curriculum by the faculty proportionate to the clinical needs of this field of study various factors involved in the learning process, and student characteristics such as peer interaction and maintaining concentration and peace. However, additional qualitative and quantitative studies in various dental schools of different countries are needed to obtain a greater understanding of effective learning experiences in dental schools.

### **Ethical approval**

This study was reviewed and approved by the bioethics committee of Kurdistan University of Medical Sciences.

### **Competing interests**

There was no conflict of interest for this research.

### **Authors' contribution**

KS and RS conceived the original idea. KS and PH carried out the interviews. KS and RS wrote the manuscript with support from NA and YZ. NA and PH extracted and categorized the results. RS supervised the project. YZ helped supervise the project.

### Acknowledgments

We sincerely express our thankfulness to all the students who participated in the interviews.

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