Student Perceptions of an Online Dental Terminology Course


Abstract: Online learning is becoming a recognized method for delivering educational content throughout institutions of higher education. Few studies have been performed regarding online learning in dentistry or dental hygiene. The purpose of this qualitative research study was to describe and analyze the experiences of thirteen students enrolled in an online dental terminology course to determine their satisfaction level. The overall perceptions of online learning were positive, and although some frustrations were apparent, the majority of students stated that they learned a great deal, found the course valuable, and were now familiar with the terminology. Students commented on the convenience of taking the course at a time that fit their schedule and a place that they did not have to commute to attend. Technical issues and student isolation seemed to be the primary drawbacks to online learning. Some students missed the interaction that exists in a regular classroom. Students strongly suggested that, to be successful in online education, one had to be a self-directed learner. In addition, visual learners were more apt than audio learners to appreciate online learning. The results of this study suggest that online learning was a valuable method for teaching dental terminology and is particularly beneficial for students with no other alternative methods for gaining access to the courses due to geographical location. Where appropriate, online courses should be considered an option for providing distance education in dental hygiene programs.

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The Internet and the World Wide Web are being used to provide instruction at many institutions of higher education in the United States and around the world. This form of asynchronous distance education, known as online or web-based learning, provides institutions and faculty with the ability to present course content to students at a place and time of their choosing. As Milstead states, “Using the Internet and course management software, educational content can be delivered to the student’s selected site on the student’s time.”

The purpose of this qualitative research study was to describe and analyze the experiences of students enrolled in an online dental terminology course to determine their level of satisfaction with online learning. Exploring students’ perceptions regarding this new technology may lead to a greater understanding of the benefits and limitations of learning online and could be useful to programs considering the implementation of distance education initiatives and/or students planning to enroll in an online course.
or computer-assisted learning (CAL) was a shift from instructor-centered to learner-centered instruction.1,3 As Sherman suggested, “The role of the instructor has changed from controller of information to guide or coach—one who facilitates or assists students in sampling and interpreting material.”3 Disadvantages have been described as restrictions due to bandwidth; slow connection speeds when using sound, graphics, and video files; time required for course development; and required Internet access.6,7

**Student Perspective: Benefits and Limitations of Online Learning**

A limited number of both quantitative and qualitative studies examined student perspectives regarding online learning and indicated advantages and disadvantages as well. A significant advantage perceived by students was access.10 This access was related to both removal of geographical barriers and continuous access to course materials at times convenient for the student.10 With online learning, students were not restricted to class attendance at times or places set by the institution, thereby allowing them to meet both employment and family commitments while attending to their educational responsibilities.10,12 Coinciding with this increased access was a reduction in travel costs.10,12 A second positive attribute of online learning was an increase in computer literacy.14,15 In addition, students were excited to have access to global resources through the Internet5,13,14 and found learning through the Internet a stimulating methodology.16 Further, students greatly appreciated the interactivity with other students and the instructor associated with a well-designed online course.2,4,12,14,17 Comprehensive discussions, group activities, and immediate instructor or computer-based feedback were also highly valued by students and were viewed as a positive attribute of web-based learning.2,4,12,14,17,19 Two studies pertaining to online learning were conducted in nursing and medicine and indicated that students were very satisfied with instruction using this form of distance education and ranked it as effective a learning tool as any other teaching and learning resource.14,16,20-22 Many students desired additional education using this type of instructional technique.13,19,20

Disadvantages associated with online education noted by students in both allied health and other higher education courses mainly revolved around technological frustrations. Students were hampered by the slow downloading of visual images, high telephone bills when a local number for Internet access was unavailable, and lack of campus computer resources.4,11,13,15 The lack of face-to-face contact with the instructor and other classmates was reported to lead to a feeling of isolation and disconnection.2,4,12,17,19,23 Moreover, in a study by Ryan,13 students said they believed that instruction in the classroom setting covered the content area more adequately. They perceived that there was more interaction and participation in the classroom setting, found faculty preparation and interaction a very important aspect of the learning process, and determined that more communication skills were required in the classroom.13 Finally, there has been resistance by students to accept a new method of learning, because the lecture format has been used in education for decades.24 These concerns raise questions regarding the value of online learning.

A combination of classroom and online education was identified by some students as the ideal teaching methodology.21 Using both methodologies would maximize the positive attributes of each type of instruction. Students would have the advantage of flexibility and access to the content as long as desired, but they would also have the interaction between student and teacher in the classroom that would allow for discussion of specific questions not as easily provided in the computer format.21

An exhaustive search of the literature yielded only one purely qualitative study pertaining to computer-assisted learning (CAL) in dentistry25 and no studies pertaining to online learning. Due to the lack of qualitative study in dental-related fields in the area of student perceptions of online learning, it was determined that a study of this nature was both essential and timely as more programs consider introducing this instructional medium into their curricula.

**Method**

An online course in Dental Terminology was developed in the summer of 1999 at the University...
of Vermont (UVM) Department of Dental Hygiene using the Web Course Tools (WebCT) program. The WebCT program was selected due to its adoption by the university administration and its user-friendly nature. The objectives for the one-credit hour course were to diminish travel time to the UVM campus for nontraditional students and to provide an alternative delivery method of the dental terminology course content.

Over a period of approximately six weeks prior to course initiation, the course content was developed into an online format. Six modules were designed encompassing such areas as dentition, tooth composition, types of teeth, tooth numbering, basic diseases of the oral cavity, and radiography; these corresponded directly with the six fifty-minute in-class lectures. In addition, two online laboratories (self-tests) of 150 minutes each were developed, again corresponding with the two in-class laboratories. The laboratories were primarily self-tests to assist students in learning the substantial amount of material. The process for module and laboratory development included such activities as revising course content and transferring it to HTML, scanning of numerous dental images, digital photographing of some dental structures not readily available, labeling all images using Adobe Photoshop, and locating and incorporating appropriate Internet links. An online final examination was also prepared using the same development process.

Thirteen students enrolled in the online Dental Terminology course. Four of the thirteen were first-year dental hygiene students who took the course as a requirement, while the other nine were practicing dental assistants throughout Vermont who took it on an elective basis. A thorough, on-site orientation session for all course participants was held at the university to introduce them to WebCT and the Dental Terminology course. Following the initial orientation, all communication was accomplished via the bulletin board or email feature of the WebCT program.

A qualitative research methodology was utilized for conducting this study in order to acquire in-depth information about the perceptions of students regarding their experiences with online learning. By determining the experiences students have had with this educational methodology, this study will help other faculty considering introducing online education into their curricula. Interviews and document review were used to triangulate the data to ensure trustworthiness of the findings.

The data were collected using a standardized, open-ended interview. All participants were asked the same basic questions in the same order, and the questions were worded in a completely open-ended format. (See Appendix 1 for the interview protocol.) Each interview was tape-recorded to capture the exact words of the participants.

**Research Design**

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Thirteen students enrolled in the online dental terminology course were invited to participate in the study. All of the students agreed to participate and completed a consent form that included information regarding confidentiality. The study was reviewed by the University of Vermont Institutional Review Board before it was undertaken, and it was found to be acceptable.

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In addition to interviews, the WebCT program results for each student were reviewed to determine information such as the number of times the students accessed the course, the time they spent on the laboratory exercises, and their grades on the examination. The addition of document review introduced multiple-data-collection methods, commonly referred to as triangulation, and helped to increase the trustworthiness of the data.27,28

Following the data collection process, the interviews were transcribed and manually coded. The goal of coding was to rearrange the data into categories that facilitated the comparison of data within and between these categories in order to develop emerging themes.27

Results

The overall perceptions of online learning were positive. Even though some frustrations were apparent, the majority of students stated that they learned a great deal, found the course valuable, and were now familiar with the terminology, which for some brought additional confidence in the workplace. Document review determined that three of the five students with the poorest grades were rather critical of the course. However, the student with the poorest course grade reported that the course was valuable and would enroll in a future online course. Four themes emerged from the results of the study. These themes were convenience, technical issues, sense of belonging, and learning style.

Convenience

Convenience was the theme that recurred continuously throughout the study. The concept of convenience could be defined in various ways, ranging from ease of access to the program to reduction in travel time. All of the students were pleased to be able to actually gain college credit from the comfort of their own homes. They found it beneficial to complete the coursework at a time that was suitable for them and compatible with their work and family schedules. One student suggested that, because his work schedule was so unpredictable, it would not have been possible for him to enroll in a traditional course. In addition, students enjoyed the flexibility of being able to access the program at any time of the day or night, as well as to work at their own pace and the ability to continuously review material until they were comfortable with the information. These findings support the conclusions of Stillman10 and Bober,12 who found that students preferred online learning because it allowed them to meet both family and employment commitments while satisfying their educational opportunities.

Not having to commute to the UVM campus was particularly beneficial for the dental assistants who lived in the more rural areas of Vermont. As a matter of fact, several students stated that they would not have enrolled in the course if they had to commute to campus. Two dental hygiene students also referred to the reduction in commute time and travel costs that have been noted in previous studies.12,13 Unanimously, the dental hygiene students were even more delighted that they did not have to attend the class that met on Monday and Friday at 8:00 a.m.

All but two students stated that they would enroll in a future online course. Interestingly, these two students were on-campus dental hygiene students. They enjoyed the online program, but missed the instructor/student and student/student interaction. (This concept will be discussed below, in the Sense of Belonging theme.) Upon document review it was determined that these students did not perform very well on the final examination, which might have contributed to their lack of enthusiasm for the online course. In addition, these two students lived on campus, so geographical location and access to the course was not an issue. These two students did, however, think that a web-enhanced course would be a desirable learning modality, supporting the findings of the Finley23 study in which students reported that a combination of both classroom and online education would be the most effective learning modality.

Technical Issues

The hands-on, on-site orientation session offered prior to the course was seen as extremely valuable by the majority of students, and they believed it alleviated a number of the technical problems. One student stated, “I would have been lost without it.” This session was particularly beneficial to the one student who had limited prior computer experience. The twelve other students stated they were computer literate and this literacy made using the online course easier. Two students stated that, due to the straightforward nature of the program, they thought that prior computer experience may not be necessary as long
as the orientation session was held. One additional benefit to the orientation session was the faculty/student interaction. One dental hygiene student stated, “It’s important to put a human face on the whole program.”

Even with the orientation session, there were a few technical glitches that were not totally unexpected because this was the first time an online course had been offered through the UVM Department of Dental Hygiene. These technical issues tended to reflect some level of frustration with the course. The most prominent technical issue occurred in the self-test/laboratory function, which required students to type responses to questions. Spelling errors were marked as incorrect. If this occurred, the students would have to re-input the answers in that section, which was frustrating and time-consuming. Ultimately, if they could not determine the correct answer, they had to use the communication tools and ask the instructor for the answer. Although the course instructor logged onto the course several times a day, waiting for the instructor contributed to a minor delay in receiving the correct answer. Recent improvements in WebCT allow the instructor to release the correct answers to the students. Technical frustrations have been found as a disadvantage in previous studies as well.4,11,13,15 We can only hope that, with the improvement in technology, these problems will be reduced or eliminated in the future.

Sense of Belonging

One of the major drawbacks to using online education for this particular course was the lack of a sense of belonging to the class as a whole. Two students felt that they belonged to the class. One of those two students was a dental hygiene student, and she gained her sense of belonging through the other onsite dental hygiene course. Two students stated that they felt a sense of belonging somewhat. However, 69 percent of the students felt detached from the faculty and other students in the class. One of the students stated, “It’s hard belonging to a screen.” Another student suggested that “online education is not made to promote class interaction.” This type of negative feedback has been noted in several previous studies as a significant drawback to the use of online education.2,4,13,17,19,23 Student responses indicated that there was a reduction in student/student interaction as well as faculty/student interaction. Using WebCT, most of the class interaction is accomplished through private email or a discussion list (bulletin board). Since the subject matter did not lend itself to in-depth discussions, it is understandable that students might have felt isolated in their coursework. Therefore, instructors considering this education methodology should evaluate the course content to determine how effectively it could be presented in an online format. This study reinforced the continual use of the WebCT communication tools to help foster a classroom atmosphere and the promotion of student/student and faculty/student interaction.

Learning Style

A unique finding of the study was related to learning style. Learning style refers to the specific strategy used for course presentation and materials to match the particular needs of the learner.30 A student’s preferred learning modality (tactual, visual, auditory, etc.) is determined by heredity, past life experience, and present environment.31 In addition, adults develop consistent and distinctive cognitive styles.31 The ten students (77 percent) who described their learning style as one where they enjoyed reading on their own and seeing pictures or visuals believed that this learning style had a positive impact on their perception of the course, especially since this course had a major graphics component. One student who described herself as a drifter with a short attention span in a classroom setting found the online experience particularly beneficial because when she drifted off, she could repeat the portion of the program she had missed. She suggested that in a classroom the teacher might repeat herself once or even twice, but would not be likely to continually repeat the material.

Conversely, the three students (23 percent) who described their learning style as more auditory or hands-on focused did not think that their learning style worked well with the online course. They missed having the instructor present the information, hearing the words and/or actually seeing the material in a real life situation. Upon document review, it was determined that these three students had three of the four lowest scores in the course, thereby confirming the importance of a visual learning style for online course participants.

Unanimously, the students suggested that one needed to be very self-directed in one’s learning style to be successful in an online course. In their estimation, independent, self-motivated learners would
adapt well to this instructional methodology, whereas individuals who tended to procrastinate and delay their coursework might find it difficult to adapt to online education. One student suggested that prior to enrolling in an online course it would be important to know your learning style to determine if it is compatible with this educational pedagogy. The concept of learning style has not been mentioned in the online literature and was unique to the present study; however, further investigation of this concept is warranted.

Limitations

The size of the sample for this study can be viewed as a limitation. Thirteen students is not a large sample size, but when using a qualitative research design, thirteen subjects is not considered to be a small sample.32 The sample was purposeful29 and included all course participants.

Ultimately, the determination needs to be made as to whether accurate information was gained from the sample. In this case, I believe the information is valuable, accurate, and representative.

Conclusions

This study provided new information related to online learning in dental hygiene education. It was determined that four themes—convenience, technical issues, sense of belonging, and learning style—emerged from the responses of the study participants.

Multiple studies have determined that convenience and access are the most positive attributes of online education.10,12,13 The results of this study support this concept in that several of the participants stated that having the course online made it feasible for them to enroll. In addition, all of the students found it advantageous to work on the course material at times that were suitable to their personal schedules.

Technical frustrations have been consistently noted as a drawback to online education.4,11,13,21 This study supported the existing literature and found that, although technology has improved dramatically, problems still arise that are unpredictable and in some cases unavoidable. Continuous pilot testing of programs may help to alleviate some of these issues, making it a more positive experience for students and faculty.

Isolation from other students and from the instructor was found to be a significant disadvantage to online learning in this study and has been noted in previous studies as well.4 Faculty should be careful to determine whether online education is an appropriate distance education medium for the subject matter they are attempting to teach. In many cases, faculty may believe that they can just take their lecture notes and slides and place them on a computer and have the student learn the material on their own. This study illustrates that continuous faculty/student and student/student interaction are essential components of successful online learning. Program selection for providing online learning should include functions in which communication between instructor and course participants can readily occur.

Previous literature regarding online education suggested a shift from instructor-centered to learner-centered instruction.1,3 The participants in this study determined that, to be successful in an online course, one had to be extremely self-directed. They suggested that individuals who tended to procrastinate in completing assignments would find online education frustrating and unproductive. Moreover, this study determined that not only do students need to be self-directed, but also that visual learners tended to be more adaptable to online learning than did auditory learners. The participants who classified themselves as auditory learners suggested that others with this type of learning style should be advised that they may find it difficult to maintain their focus and commitment during online courses. This is preliminary data and future research should be directed toward applying validated learning style inventories with students enrolled in online education courses.

There were very few differences between the perceptions of the dental assistants and the dental hygiene students regarding the online course. All students engaged in the course and found the material beneficial. Similarities were noted between the two groups in their responses regarding previous computer knowledge, technical frustrations, convenience, and improved knowledge. The major difference between the two groups was that two of the dental hygiene students reported that they would not enroll in future totally online courses, whereas the majority of dental assistants asked when another online course might be available. As stated previously, these two
students were on-campus students who had access to the dental hygiene courses.

Overall, students were satisfied with the online course, and the majority found it an effective method for providing the dental terminology content. The dental hygiene students believed that many of the courses in the dental hygiene curriculum could be offered using this medium, although doing so would require some ingenious planning and implementation procedures. Therefore, the results of this study suggest that online learning was a valuable method for teaching dental terminology and is particularly beneficial for students with no alternative methods for gaining access to the courses due to geographical location. Where appropriate, online courses should be considered as an option for providing distance education in dental hygiene programs.

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REFERENCES

APPENDIX 1

Interview Questions
1. Why did you choose to enroll in the online course?
2. Describe your overall perception of taking the online dental terminology course.
3. What were the benefits or challenges you encountered while taking this online course?
4. How did your past computer knowledge affect your performance in the course?
5. Would you consider enrollment in another online course? Why or why not?
6. How has the course content improved your knowledge level in dentistry or dental hygiene?
7. How beneficial did you find the orientation session?
8. If you had to name one positive aspect of taking a course online, what would it be? One negative aspect — what would it be?
9. Did you feel a sense of belonging to the class as a whole while enrolled in the course? Why or why not?
10. Describe your learning style, i.e., do you learn better listening to a lecture, seeing a visual, reading on your own, working in groups, or any combination of the above? Why did this learning style work well or not work well with online education?
11. If you were the course instructor, what changes or enhancements would you make to the course?
12. Would online courses work for a majority of your higher education courses? Why or why not?

For Dental Hygiene Students Only
13. What courses or portions of courses in dental hygiene do you think benefit from the traditional classroom method?
14. What courses or portions of courses in dental hygiene do you think would lend themselves to being taught online?