Comparing E-Learning and In-Person Teaching Methods for the Course "Clinical Aspects of Audiology" in Syrian Postgraduate Audiology Students

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Abstract

Background: Due to the lack of studies regarding e-learning in the academic field in Syria, this study was conducted to discuss the importance of e-learning and the probability of developing it. In this study, the researchers compared the effectiveness of traditional learning with e-learning regarding student acceptance of the scientific material and their practical and clinical experiences.

Objectives: Study the efficacy of E-learning compared to traditional in-class learning for the Master of Audiology Students and assess the quality of e-learning as a substitute of traditional ways for post-graduate students.

Methods: In the 2019/2020 academic year at the College of Health Sciences at Damascus University, traditional learning was applied to teach 31 first-year audiology master's students on the clinical aspects of audiology. Subsequently, in the 2020/2021 academic year, e-learning was applied to teach 29 first-year audiology master's students. A comparison was conducted between the two groups to assess student acceptance of the scientific material, their satisfaction with the teaching and evaluation methods using the Exact Fisher test, and the practical and clinical experiences they gained using the t-test to compare the results of their assessments.

Results: No statistically significant difference was observed between the two groups (P > 0.05) regarding student acceptance of the subject, teaching methods, and evaluation process. However, students in the e-learning group reported feeling more comfortable dealing with the subject than those in the traditional learning group (P < 0.05). Additionally, traditional learning students exhibited a higher motivation level than their e-learning counterparts (P > 0.05). No statistically significant difference was found in terms of theoretical knowledge and practical experience gained between the two groups (P > 0.05).

Conclusion: Both traditional learning and e-learning methods demonstrated efficacy in delivering scientific material and were well-received by students. Thus, e-learning proved effective as a useful and acceptable learning method in the Syrian academic field.

Keywords: Motivation; Computer-Assisted Instruction; Audiology; Universities; Syria; Students; Personal Satisfaction

Background

Traditional education, which typically involves faceto-face or in-class teaching, has long been a prevalent and effective educational method. Being rooted in live interactions and social communication (1), traditional learning promotes student interaction in shared physical spaces, providing opportunities for interpersonal relationships. The visual and non-verbal cues exchanged during lectures enable communication, allowing immediate feedback on spontaneous inquiries. Additionally, face-to-face interactions enhance student engagement and promote concentration.

The global onset of the COVID-19 pandemic in 2020 profoundly affected education worldwide. Amid uncertainties regarding the disease and its management, educational institutions were compelled to address the

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challenges posed by interruptions to learning. This pandemic underscored the importance of exploring alternative approaches to maintain the educational process, particularly in fields like medical education (2). These unprecedented circumstances provided opportunities for e-learning initiatives to emerge.

E-learning is an innovative approach to acquiring knowledge, skills, and expertise (3). It utilizes various technological tools to facilitate learning anytime and anywhere, tailored to individual preferences (4). This modern educational paradigm leverages technology to augment learning experiences (5).

E-learning is a transformative educational method that originated in the 1980s and has evolved over time to offer enhanced features, accessibility, and global acceptance (6). A key distinction between e-learning and traditional methods lies in social interaction (7). In contrast, traditional settings facilitate direct teacherstudent engagement, and e-learning affords flexibility in both timing and location for participation (8,9). Moreover, e-learning capitalizes on multimedia resources for content delivery, unlike the oral delivery typically associated with traditional instruction.

In e-learning environments, learners actively exchange information, fostering collaborative discussions on diverse topics. At the same time, traditional learning is mainly based on the teacher, who is responsible for delivering the learning material (10).

Several studies have explored the differences between e-learning and traditional learning across various aspects of the learning process. In 2009, Congdon and his colleagues (11) undertook a study comparing the academic performance and student experience of two groups of first-year pharmacy students. One group attended in-person lectures at the college, while the other received lectures electronically. Surprisingly, the study found no statistically significant differences between the two groups regarding academic performance and student experience.

In 2018, Almaghasleh (12) conducted a study in Saudi Arabia, revealing that most pharmaceutical students at King Saud University preferred the traditional learning approach and synchronous e-learning over asynchronous e-learning. Similarly, Ronnie's study in 2020 (13) explored the implementation of e-learning for medical students in the Philippines during the COVID-19 pandemic. The study highlighted various obstacles faced by students socially, technically, and personally, as well as factors related to the college they attended.

Paul and colleagues (14) published a study to determine the most effective learning method by

comparing academic performance and student experience between e-learning and traditional learning. Although no significant differences were found between the two learning methods, the researchers addressed the importance of enhancing e-learning techniques due to their flexibility and ability to cater to a broader audience of learners.

In the Arab world, the implications of e-learning are still in the beginning stages, and it has not yet gained acceptance from all academic staff and students due to the current modest infrastructure, limited technical capabilities, problematic virtual learning environment, and weak technical skills. Dashash, in 2023 (15), discussed this issue and addressed the importance of e-learning and the possibilities for implementing it in higher education institutions. She also suggested many methods for designing and delivering online education in the Arab world.

Based on the existing knowledge and the lack of studies investigating the effectiveness of online learning in audiology in Syrian universities and in academic fields in general, this study aimed to compare traditional and e-learning methods for postgraduate audiology students.

Objectives

Due to the lack of previous studies about e-learning in Syrian universities, this study was done to compare this method of learning with the traditional learning for post graduate students. this helps to prove its efficacy and the possibility to depend on e-learning as an official way of teaching for students according to its flexibility and affordability to most of the students.

Methods

This study included 60 postgraduate students from the Audiology Department of the Health Sciences Faculty at Damascus University who agreed to take part in this study between 2019 and 2021. Ethical approval was obtained from the Syrian Virtual University (No. 370/0, dated 3/3/2024). These students were divided into two groups. The first group consisted of 31 students (20 females, 11 males) in their first year of the audiology master's program during the 2019/2020 academic year. This group received lectures on "Clinical Aspects of Audiology" in traditional classroom settings at the Health Sciences College of Damascus University through weekly lectures until the COVID-19 lockdown. The second group included 29 students (16 females, 13 males) in their first year of the audiology master's program during the 2020/2021 academic year. Due to the pandemic and the shift to e-learning, this group also studied "Clinical Aspects of Audiology" online.

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Synchronous lectures were organized weekly to engage the students in discussions and exchange ideas.

The study utilized an electronic survey on Google Forms (Google LLC, Mountain View, California), comprising two questionnaires. The first questionnaire was administered to the traditional learning group and the other to the e-learning group. Each questionnaire consisted of nine multiple-choice questions focusing on student satisfaction, learning model, teacher interaction, clinical experience, theoretical knowledge acquisition, and obstacles faced during the course. Responses were rated using a Likert scale with four grades: A. very good, B. good, C. acceptable, and D. not satisfactory.

The validity of the questionnaires was assessed by three researchers in the field of medical education (three professors from the Health Sciences College and the Medical Education Master's program of the Syrian Virtual University). They assessed the questionnaires for clarity, style, ease of understanding, and layout. They also reviewed the questionnaires for content validity, including readability, clarity, and comprehensiveness. They all agreed that the questionnaires could be used to attain the desired results after modifying some details, which were followed and corrected as requested (CVI = 1, CVR was between 0.63 and 1 for all items; no item was less than 0.0).

The reliability was assessed using a test-retest reliability measure conducted on two pilot samples from both groups (five students from each group). The pilot samples were asked to repeat the questionnaires the next day, and concordance between the assessments was calculated for each student. Cronbach's alpha coefficient was also used to measure the reliability of the questionnaires; their value was (CA = 0.87), which indicated good and acceptable reliability.

The researcher evaluated the theoretical and clinical exam results of both groups and their clinical assessments during the academic years.

Data analysis was performed using SPSS V27 with a t-test to compare mean exam results and clinical assessments. Fisher's exact test was also applied to compare the questionnaires' results between the two groups. Significance was set at a P value < 0.05.

Results

We obtained the results summarized in Table 1 by comparing the results of each compatible question from both questionnaires using Fisher's Exact Test.

The researchers found no statistically significant differences in the results of questions 1, 2, 4, 5, 6, 8, and 9 regarding the students' assessment of the subject, time flexibility of learning, adequacy of the teacher's explanation of the subject's information, the teacher's ability to answer the students' questions adequately, the students' satisfaction with the learning model, use of the subject's information in clinical practice, and the students' satisfaction with the assessment methods (types of exams).

On the other hand, a statistically significant difference was noted when comparing the results of question 3, which asked about the location flexibility of the lectures. The e-learning group felt more flexible attending the lectures online, while the traditional learning group found it a little demanding to attend the lectures in person at the college. In addition, question 7, which asked about the motivation and competition the students felt while studying the subject, showed that the traditional learning group was more motivated and competitive.

To assess the difference in the theoretical knowledge the students gained from the subject, the researcher reviewed the results of the theoretical exams for the two groups. The p-value was 0.460 based on the t-test to compare the mean values of the two groups. Thus, there was no statistically significant difference between the two groups (Table 2).

learning	
learning	
96	97
62	65
79.65	80.72
80	80
9.196	9.78
	96 62 79.65 80 9.196

 Table 2. The Results of the Theoretical Exams (Out of 100%)

SD: Standard deviation

The same was observed when comparing the clinical practice results of the two groups. The t-test showed a p-value of 0.413 > 0.05; no statistically significant difference between the two groups was observed (Table 3).

Tabl	le 3.	The	Resul	ts of	the	Clinica	l Practice	(Out of	f100%)	
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	Traditional	E-learning
	learning	
Highest value (out of 100%)	100	100
Lowest value (out of 100%)	70	68
Mean	83.29	84.06
Median	82	84
SD	9.63	10.25

SD: Standard deviation

Discussion

This research compared traditional and online learning to highlight the importance of e-learning as a

valuable teaching method that can be used widely without affecting the quality of teaching or the learning process. We used electronic surveys to gather the students' viewpoints on the differences between the two teaching methods. Revising the assessment results of the two groups helped determine the effect of the teaching method on the clinical experience and knowledge that the students gained through either method.

The present study did not indicate any significant differences between the traditional learning group and the e-learning group regarding the assessment of the subject or the time flexibility of studying because e-learning is dependent on synchronous lectures, and both groups had to be committed to the exact time of lectures. At the same time, the adequacy of the teacher's explanation of the subject's information, the ability of the teacher to answer the students' questions adequately, the benefits the students received from the two models of teaching, the ability to use the subject's information in clinical practice, and the satisfaction of the students with assessment methods all yielded similar results. This can be attributed to the fact that the same tutors taught the subject to both groups, ensuring that the same amount and quality of information were delivered, regardless of the teaching technique. However, a statistically significant difference was found between the two groups regarding the flexibility of lecture location. The e-learning group felt more flexible, as they could attend the lectures online without the obligation to go to the college and attend in person, unlike the traditional learning group. Students from distant locations did not have to travel or spend money and time on transportation. The researcher also found a statistically significant difference when comparing the two groups regarding motivation and competition factors. Students in the traditional learning group reported feeling more competitive and motivated than students in the e-learning group because being with other students in the same place creates a suitable atmosphere for competition and discussions with tutors and peers. In addition, when students are together in one place, it allows them to prove their knowledge and capabilities, compared to being alone behind the screens.

Similar findings were obtained by Amanda in 2018 (16), who found that students in e-learning feel more comfortable learning in a virtual environment than those in traditional learning. Furthermore, Allaham, in 2023 (17), found that online learning is effective for improving learning and attaining engagement and satisfaction. Al Masri in 2021 (18) reached the same result, stating that most participants in

e-learning courses show satisfaction with their knowledge and self-confidence improvement after the e-learning experience. On the other hand, in 2020 (19), Arifani found that motivation factors and social interactions are more apparent and effective among students in traditional learning than among e-learning students. These results correspond firmly with the results of this study.

When talking about the theoretical knowledge and clinical experience that the students of the two groups gained from studying the subject of "Clinical Aspects of Audiology," no statistically significant differences were found between the two groups. Kanjarawi, in 2022 (20), reported that e-learning is an effective and feasible learning method. It helps improve clinical skills and promotes positive attitudes of clinical practitioners toward it. Vallee in 2020 (21) found that e-learning consistently improves knowledge outcomes when compared with traditional learning in health education, while Faulconer in 2018 (22) found that academic results are better for students in e-learning compared to traditional learning. In 2014, through a systematic review, Salter and his colleagues (23) found that e-learning effectively increases knowledge and is a highly acceptable learning method among students. However, there is limited evidence that e-learning effectively improves skills or professional practice, and there is also no evidence that e-learning is effective at increasing knowledge in the long term. Voana and colleagues in 2018 (24) found that compared to traditional learning, e-learning may make little or no difference in patient outcomes or health professionals' behaviors, skills, or knowledge.

The researchers faced some limitations while conducting the study. One of them was the small number of students in the two groups, which could negatively affect the significance of the statistical results. In addition, there was a lack of experience in the academic field with e-learning methods and techniques. The study also faced some obstacles due to technical problems and the limited quality of the internet for both the tutors and the students, which affected the quality of information delivery and effective communication between the students and the tutor.

As this study depended on early trials of e-learning in the Health Sciences College, other studies should be conducted to improve the e-learning technique and learn from the experiences of other universities abroad in this field.

Conclusion

This study helps assess the differences between e-learning and traditional learning at Damascus University. It confirms that e-learning, when applied to audiology master's students, has the same advantages as traditional learning. However, the traditional learning students admitted they had more motivation and enthusiasm than the e-learning students. In contrast, e-learning provided more chronological and demographic comfort than traditional learning. This study also found that e-learning and traditional learning do not differ in the theoretical or practical knowledge they provide to students.

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Question No.	Traditional learning				E-learning				P value			
	What is your assessment of the course 'Clinical				What is your assessment of the 'Clinical				0.36			
1	Aspects of Audiology' taught traditionally at the				Aspects of Audiology' course you took							
		Health So	ciences Colle	ege?	thr	ough the e-l	learning moo	lel?	0.50			
	A:51.6%	B:29%	C:16.1%	D:3.2%	A:27.9%	B:48.3%	C:13.8%	D:0.0%				
	Are you satisfied with the timing				Are you satisfied with the time flexibility				0.41			
2	of the lectures?				of the e-learning model?							
	A:35.5%	B:41.9%	C:16.1%	D:6.5%	A:25%	B:41.7%	C:24.1%	D:20.7%				
	Are you satisfied with the location of the lectures at				Are you s	atisfied with	the location	flexibility				
3	the Health Sciences College?				of the l	ectures in th	e e-learning	model?	0.016			
	A:25.8%	B:45.2%	C:12.9%	D:16.1%	A:65.5%	B:17.2%	C:10.3%	D:6.9%				
	Are you	satisfied wit	h the teache	er's explanation	Are y	you satisfied	with the tead	cher's				
4	of the subject's information?				role in facilitating the course?				0.805			
	A:64.5%	B:19.4%	C:12.9%	D:3.2%	A:58.6%	B:27.6%	C:13.8%	D:0.0%				
	Are you satisfied with the teacher's ability				Are you satisfied with the teacher's ability				0.861			
5	to answer your questions adequately?				to adequately answer your questions?							
	A:48.4%	B:25.8%	C:22.6%	D:3.2%	A:55.2%	B:27.6%	C:13.8%	D:3.4%				
	Are you sa	tisfied with	the benefits	you gained from	Are you satisfied with the multimedia and							
	takin	g the course	in the lectur	re room and	online resources used to teach the course?							
6	interacting live with the teacher and other								0.117			
	A 10 40/	S1		D 0 70/	A 40 20/	D 210/	C 12 00/	D (00/	_			
	A:19.4%	B:54.8%	C:16.1%	D:9.7%	A:48.3%	B:31%	C:13.8%	D:6.9%				
7	Do you feel any sense of motivation				Do you reel a sense of motivation				0.012			
/	or competition?											
	A:48.4%	B:29%	C:16.1%	D:0.5%	A:10.5%	D:48.5%	C:24.1%	D:17.2%				
	Do you feel the information you gained from the				the source delivered through the a learning				0.250			
8	course taught traditionally is useful in your clinical				model is useful in your clinical practice?							
	A.41 0%	P.38 7%	C.10.4%	D:0.0%	11100er 1	B-37 0%	C.24 1%	D.10.3%	30%			
	Aro you	D:50.7 %	b the access	D:0.0%	A re you satisfied with the assessment methods?							
9	Are you satisfied with the assessment methods: $A_{22} = 20'$ D $200'$ C $25 = 80'$ D $12 = 00'$				Are you sa	B.44 804		D.2 40/	0.332			
	A:52.5%	D:29%	0:25.0%	D:12.970	A:20.7%	D:44.0%	0:51%	D:5.4%				

Table 1. The Difference between the Two Groups' Answers