

Online Learning Satisfaction and Acceptance among Al-Quds University Dental Students

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How to cite this paper: Abu Hantash, R. O., Abu Younis, M., & Assaf, M. (2020). Online Learning Satisfaction and Acceptance among Al-Quds University Dental Students. *Creative Education*, 11, 2002-2013. <https://doi.org/10.4236/ce.2020.1110146>

Received: September 11, 2020

Accepted: October 19, 2020

Published: October 22, 2020

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Abstract

Objective: Online learning gained credit and acceptance among university students all over the world. COVID-19 outbreak urged educational institutions to adopt that model of learning. A study conducted at Al-Quds university in Jerusalem-Palestine among first, second, third, fourth- and fifth-academic year dental students aimed to evaluate their satisfaction on online learning. Academic year level was also assessed to investigate its effect on E-learning. **Materials and Methods:** The participants were 328 students (257 females, and 71 males) and their mean age was (20.5 years). A reliable and valid questionnaire was used to assess their perception levels regarding “perceived ease of use” (PEOU), “perceived usefulness” (PU), “perceived online education support service quality” (PSQ), and “online learning acceptance and student satisfaction (OLAS). Data were analyzed using factor analysis, structural equation model techniques, independent sample t-test and logistic regression. **Results:** Mean scores for the students on the questionnaire domains perceptions of online learning ranged from 2.14 (1.57) to 2.72 (1.70) on a 5-point scale. Cronbach’s alpha test is used to measure the reliability and internal consistency of the associated questionnaire domains, (Cronbach’s Alpha Based on Standardized Items > 0.896, and *P value* = 0.000). Academic year level has significant (*P value* = 0.000) effect on all questionnaire perceptions domains (PEU, PU, PSQ, and OLAS). **Conclusions:** Online education could be accepted among dental students in the clinical level of dental education (fourth and fifth years). First, second, and third dental year students (preclinical stages) didn’t accommodate and adopt E-learning technology. Expenses, COVID-19 pandemic, facilities and logistics regarding E-learning could be factors related to what has been yielded in this study. Covid-19 pandemic might affect negatively on the results. Further research should be conducted to explore the value effectiveness of E-learning.

Keywords

Online Learning, Dental Students, Pandemic, Questionnaire Perceptions

1. Introduction

Online learning which depends on technical-based tuition and training, provides students with a virtual environments and activities, such as: investigation and audiovisual interaction with a variety of subjects (Al Rahmi et al., 2018). Burden has been placed on institutions of education and higher education to enable access of the virtual courses for online learning (Amado-Salvatierra et al., 2016). E-learning is the teaching that is assisted via information and communications technology, both inside and outside the class room. Although its tools have been used in many settings for a long time, evidence of their application in the education of medical professionals is scarce, especially in the developing countries (Dev et al., 2006; Frehywot et al., 2013). Meanwhile, Yew et al. (2016) suggested that, to study something completely, students needed to hear, discuss, see, query questions about it, and relate concepts to existing experiences. Online learning has been revealed to be effective as other educational methods for gaining of knowledge, skills, and behavior (Means et al., 2009; Cook et al., 2008). Advantages of E-learning include flexibility, course upgrading, adaptive instruction, control over learning activities, and data collection for assessment (Cook & Triola, 2014). However, regarding the cost effectiveness of E-learning, controversy is existent between saving costs (if compared with face to face education) (Sandars, 2010; Maloney et al., 2015) and high expenses for its development and maintenance (Cook, 2014; Stotzer et al., 2013; Delgaty, 2013).

The spread of corona-virus (COVID-19 pandemic) has led to profound changes in the social interactions among university environment, which forced teaching institutions to adopt emergency E-learning protocols (Murphy, 2020).

However, no study was found to evaluate university students' acceptance to online learning in Palestine during the pandemic of COVID-19, especially among dental students. Therefore, the aim of our study was first to assess dental students' awareness, acceptance and satisfaction towards E-learning at Al-Quds University, and then to evaluate the effect of students' academic level on this educational format.

2. Materials and Methods

This study conducted during the spring semester of the academic year 2019-2020 (May-June 2020) at the faculty of Dentistry in Al Quds University-Palestine. A reliable and valid questionnaire (**Appendix A**) was distributed through a web-based survey among first, second, third, fourth and fifth academic year students. From among a total of eight hundred fifty participants in the survey, the responses of three hundred twenty-eight participants, who were between the ages of

17 and 24 years, were analyzed (**Table 1**).

Each student was given a brief explanation of the investigation and the procedures to be undertaken. Informed consent was obtained from each participant.

The questionnaire used in this study was originally developed by Jung-Wan Lee in 2010 who studied possible differences between Korean and American students in terms of their awareness levels regarding online learning support, acceptance, and satisfaction (Lee, 2010). In order to assess the students' attitude toward online learning, four major domains were rated on a 5-likert scale from "totally disagree = 1 to totally agree = 5". Those domains were: "perceived ease of use" (PEOU), "perceived usefulness" (PU), "perceived online education support service quality" (PSQ), and "online learning acceptance and student satisfaction (OLAS). PEQU addresses four questions, PU has five questions, PSQ measures three items and OLAS consisted of four questions (**Appendix A**).

The null hypothesis was that during online learning technology there was no effect of the academic level on students' perception levels regarding online education support service quality, online learning acceptance, and satisfaction.

This study was reviewed and approved by Research Ethics Committee at Al-Quds University; identification number is (133/REC/2020).

Factor Analysis and Reliability Test

Factor analysis with a varimax rotation procedure was performed using SPSS (Statistical Package for the Social Sciences, version 26.0, Inc., Chicago, IL, USA) in order to clarify the domains of students' attitude towards online learning acceptance and satisfaction. To test factor analysis, Kaiser-Meyer-Olkin (KMO) overall measure of sampling adequacy (MSA) was 0.952, which is considered marvelous and within the adequate level, and was significant at $p = 0.000$. The Bartlett's test of sphericity was 5022.585 (degree of freedom = 120), and significant at $p < 0.001$ which indicated a highly significant association among the questionnaire items. In this context, a reliability test was also performed which

Table 1. Demographics of Participants

Profiles	Items	No.	Percentage %
Gender	Male	71	21.6
	Female	257	78.4
Age (Years Old)	17 - 18	29	8.8
	19 - 21	210	64.4
	22 - 24	88	26.8
Academic Year Level	First	61	19
	Second	71	22
	Third	76	23
	Fourth	73	22
	Fifth	47	14

showed that the 16-item instrument had Cronbach's alphas over 0.70, ranging from 0.896 to 0.930 (**Table 2**). This data gives the reliability and the validity of questionnaire used in this study.

3. Results

Three hundred twenty-eight dental students were recruited to participate in this study. Two hundred fifty-seven students were females (78.4% of the subjects) and seventy-one were males (21.6% of the subjects) (**Table 1**). These students were aware of responding the questionnaire. Students' age ranged from 17 to 24 years with a mean age of 20.51 and standard deviation of 1.42 years (**Appendix A**).

Regarding students' awareness towards online learning, all the items of the questionnaire (except PEQU and PSQ) showed mean score rating below 2.5 on a 5-point Likert scale from 1 to 5. PEQU showed 2.51 and PSQ showed 2.72 **Table 2**. PEQU4 item showed the highest mean score rating (2.91), followed by PSQ 1 that showed a mean score rating of (2.73). On the contrary, OLAS 2 showed the lowest mean score rating of (2.06) **Table 2**.

Figure 1 shows the distribution of dental students' classes which participated in the study. The distribution of students in the classes were as the following: sixty one students were from first class (19% of the subjects), seventy one were from second class (22% of the subjects), seventy six (23% of the subjects), seventy three were the fourth class (22% of the subjects), and fourth seven were from the fifth class (14% of the subjects) **Table 2**.

Regarding the impact of academic year level on questionnaire domains ratings, it is obvious that there is an effect of academic year on all domains (**Table 3**). Using Independent-Samples Kruskal-Wallis Test, there is a significant association between PEQU, PU, PSQ, ALOS items and academic Levels, (P value = 0.000). It does worth to mention that the mean score ratings of PEQU and PSQ domains were above average for fourth- and fifth-year classes (**Figure 2** and **Figure 3**).

While, the mean score rating for PU domain, fourth- and fifth-year classes were higher than other classes (**Figure 4**). This study also, showed that mean score ratings of the overall satisfaction and acceptance for the fourth- and fifth-year classes were higher than first, second, and third year classes (**Figure 5**). Additionally,

Table 2. Reliability of questionnaire.

Variable	No. of items	Cronbach's α
Perceived ease of use (PEOU)	4	0.896
Perceived usefulness (PU)	5	0.923
Perceived online education support service quality (PSQ)	3	0.922
Online learning acceptance and student satisfaction (OLAS)	4	0.930
Total reliability of the questionnaire	16	0.903

Table 3. Independent-Samples Kruskal-Wallis Test Summary of the effect of the Academic level on Questionnaire items.

	Test Statistic	Degree of Freedom	Asymptotic Sig (2-sided test)
PEQU	55.230 ^a	4	0.000
PU	43.916 ^a	4	0.000
PSQ	44.564 ^a	4	0.000
OLAS	45.820 ^a	4	0.000

^aThe test statistic is adjusted for ties.

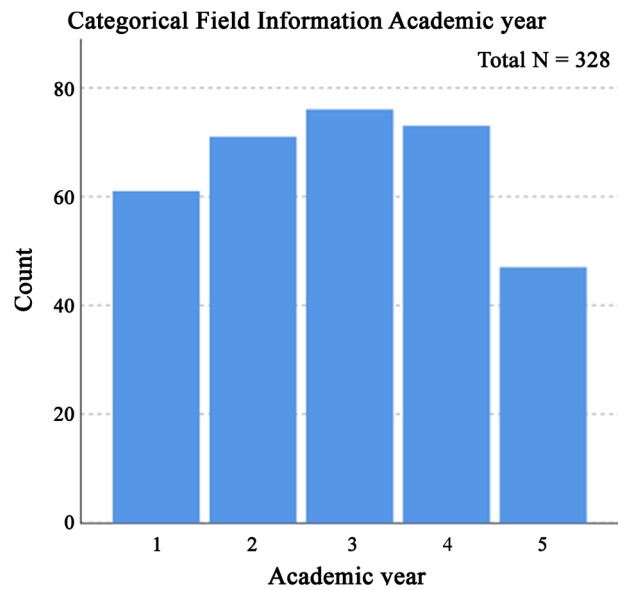


Figure 1. The distribution of the students participated in the study according to the Academic year level. 1: First year, 2: Second year, 3: Third year, 4: fourth year, 5: Fifth year.

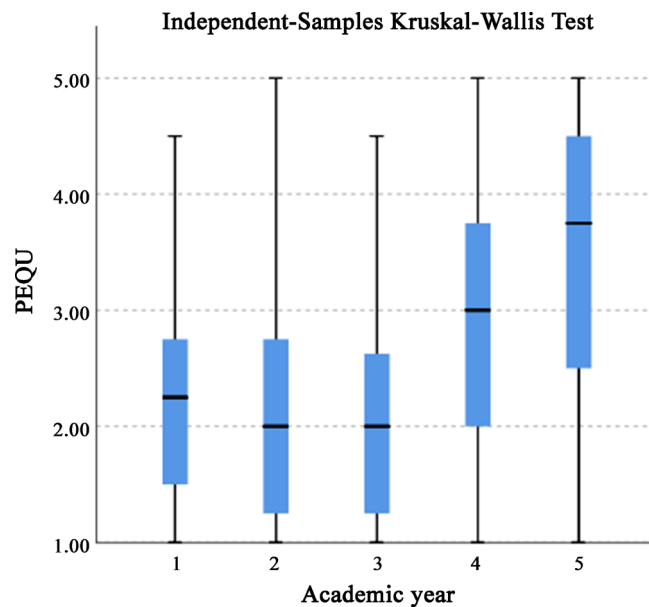


Figure 2. Scoring of Academic Year Level and PEQU item histogram using Independent-Samples Kruskal-Wallis Test.

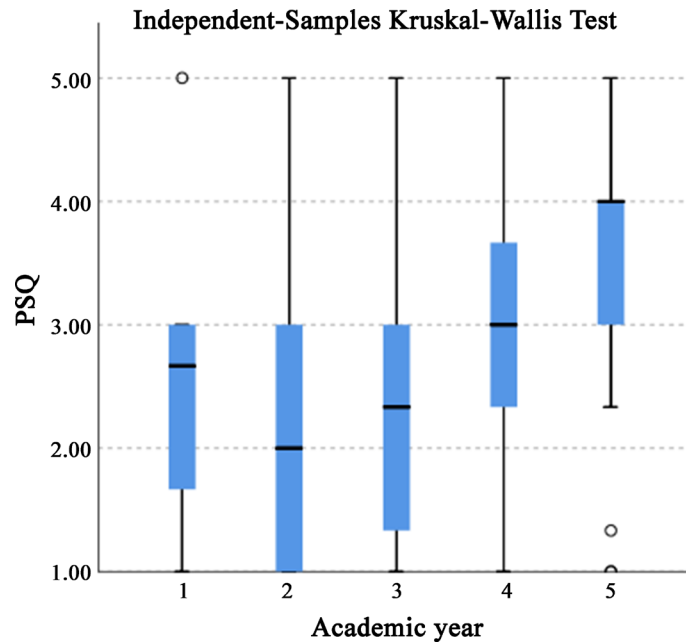


Figure 3. Scoring of Academic Year Level and PSQ item histogram using Independent-Samples Kruskal-Wallis Test.

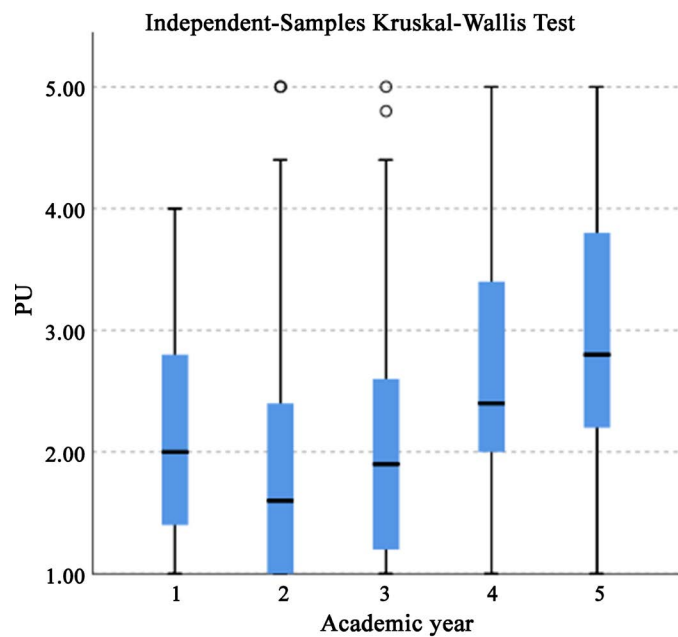


Figure 4. Scoring of Academic Year Level and PU item histogram using Independent-Samples Kruskal-Wallis Test.

fifth year class students scored the highest mean score rating in all questionnaire domains when compared with other classes.

4. Discussion

E-learning models have concerned much attention in recent years as possible ways to meet the scarcities as evidenced by face to face learning, and they are

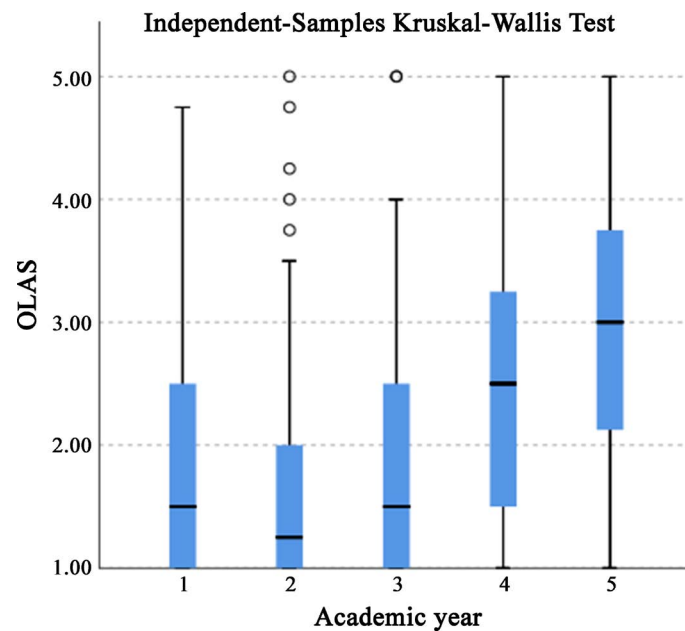


Figure 5. Scoring of Academic Year Level and OLAS item histogram using Independent-Samples Kruskal-Wallis Test.

useful tool for disabling walls to access for health professions' training (Frehywot et al., 2013). However, challenges implemented in e-learning medical education, are: insufficient infrastructure, slow speed and low quality of videos or visual outputs, difficulties in reading content from a computer screen, slow downloading from the internet, inadequate computer services, and frequent electrical power shortages (Agrawal et al., 2011; Kaliyadan et al., 2010; Johnson et al., 2007; Nartker et al., 2010; Erah & Dairo, 2008; de Maio & Ferreira, 2001; Corrêa et al., 2003; Obura et al., 2011; Vincent et al., 2003).

A recent coronavirus (2019-nCoV), which caused an epidemic of acute respiratory syndrome in humans in Wuhan, China, started on 12 December 2019 (Zhou et al., 2020). Travel limitations, quarantines, self-isolation, social distancing, and intensified hygiene are considered public governmental measures to manage virus outburst (Cloulthard, 2020). Due to that pandemic, universities were forced to learn and educate students through online learning protocols. E-learning solutions gave the educational institutions the opportunities to overcome the compulsory dismiss of university students. However, online learning is considered a contingency and emergency plan during this pandemic. Educational institutions need well planned strategies, profound budget, adequate technical support, and well-trained staff to adopt this strategy (Kaliyadan et al., 2010; Nartker et al., 2010; Erah & Dairo, 2008; de Maio & Ferreira, 2001). In addition, students should have the motivation and the ability that enable them to accept and cope with E-learning. This is critical in tolerating E-learning program regardless of whether such a program is accomplished at the faculty level, or across an educational institution (Frehywot et al., 2013). According to what was mentioned above, it can be implied that dental students didn't accept online learning

especially first, second, and third year classes.

The Wang Lee questionnaire (Lee, 2010) which was used in this study to rate students' satisfaction and acceptance towards online learning, was shown to be valid and reliable. As shown in **Table 2**, this study supports the previous study in terms that the composite reliability (Cronbach's α) for each domain ranged from 0.896 to 0.930, suggesting acceptable levels of reliability, indicating the scales had good reliabilities and validities. Meanwhile, Kaiser-Meyer-Olkin (KMO) overall measure of sampling adequacy (MSA) was 0.952, which is considered marvelous and within the adequate level, and was significant at $p = 0.000$. Jung-Wan Lee (2010) investigated the online support service quality, online acceptance, and student satisfaction among Korean and American students. He suggested that the acceptance of online classes would be valuable for both study participants. On the contrary, the participants in this study showed less satisfaction and acceptance towards online learning if compared with previous studies (Al Rahmi et al., 2018; Amado-Salvatierra et al., 2016; Means et al., 2009; Cook et al., 2008; Lee, 2010). All questionnaires' ratings were less than 3, which can be attributed to the compulsory dismiss of the students and the implementation of the online learning contingency emergency plan due to Covid-19 outbreak. The low acceptance of dental students toward E-learning in this study is consistent with the findings suggested by Noesgaard & Orngreen (2015), who reported that it was hard to confirm E-learning effectiveness on teaching enhancement as a teacher can apply various approaches as required. Similarly, Yew et al. suggested that students' interactions of hearing, seeing, discussing, asking questions and relating concepts can accomplish a successful learning. In this context, various studies (Corrêa et al., 2003; Kheng, 2008; Akkoyunlu & Solylyu, 2008; Muñoz, 2010) showed that the lack of face to face learning was also a challenge addressed in pure E-learning and contributed to professional loneliness and decreased learning skills. Frequent electrical failure, limitation in bandwidth and inadequate infrastructure could explain the findings of this study. In a study conducted by Frehywot et al. (2013), they found that the potential of E-learning adopts a firm level of institutional keenness in human and infrastructural funds that is not always present in developing countries. However, Palestine has hard social and economic conditions which might be considered one of the aforementioned countries in this regard.

However, the highest mean score which was found in the study, was PEQU4 that measured the ease of online learning and was 2.91. The highest mean score was PSQ that measured students' acceptance towards the faculty and the support service affairs and was 2.72. This reflected the huge efforts presented by the faculty administration and the support service affairs that delivered to the students to facilitate online learning at Al Quds university. Covid-19 pandemic could affect negatively on the findings of this study; however, this study was conducted during this pandemic. Further investigations are required to explore this impact.

Academic level plays a vital role in adopting E-learning. The findings of this

study, showed that higher dental students' classes (fourth and fifth years) were more satisfied and accepted online education when compared with other classes. This finding was consistent with the study conducted by Wittich et al. (2017) who conducted a study and investigated e-learning in graduate medical programs, and they reported that in US most internal medicine residency programs use e-learning and they have more positive perceptions of E-learning. Although more programs were used as (live, real-time, and simultaneous) utilization learning methods than virtual where learners are responsible for self-teaching and instruction. Accordingly, higher academic level classes can accept and are mature enough to adopt e-learning, due to the fact that they were taught through the first three years via conventional learning methods (face to face), and online learning added a new era to their learning experiences. On the contrary, first, second and third years were still in scarce to conventional teaching methods, in terms of discussing, hearing and asking questions to the instructors. However, this needs further investigation to consider that in online learning.

5. Conclusion

In the light of the current study, the following can be concluded and recommended.

Dental students' acceptance and satisfaction towards online education were below average during COVID-19 outbreak. Further investigation is required to explore the impact of COVID-19 outbreak on students' attitudes towards online learning.

Faculty support and online education support service affairs had an effect in raising students' awareness and acceptance towards online learning.

Online learning acceptance and student satisfaction questionnaire is a valid and reliable tool that can be used in further researches. This study recommends it for measuring satisfaction and acceptance online learning among university students.

Academic year level could be attributed to have an impact on students' online learning acceptance. Fourth and fifth year dental students accepted and were more satisfied with online learning when compared with other year classes. Further investigation is needed to investigate this finding.

It is also recommended to educate teachers on methods to make E-learning more convenient and efficient for students.

Further efforts and well-planned strategies are needed to dissolve the existent challenges to promote and enhance the sustainability of online learning especially among dental students.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix A. Summary of Descriptive Statistics and the Questionnaire Items

Questionnaire Item (5-Point scale ranging from "totally disagree = 1" to "totally agree = 5")	Mean (SD)
PEQU	2.51 (1.75)
1. I find it easy to use online learning system to do what I want it to do	2.54 (1.32)
2. I find the online learning system is clear and understandable for me	2.27 (1.26)
3. It is easy for me to become skillful at using the online learning system	2.33 (1.34)
4. I find the online learning system easy to use	2.91 (1.37)
PU: Using online learning system	2.29 (1.52)
1. enables me to accomplish programs more quickly	2.46 (1.25)
2. improves my ability to accomplish academic tasks	2.3 (1.23)
3. increases my productivity in accomplishing academic tasks	2.22 (1.23)
4. enhances my effectiveness in accomplishing academic tasks	2.26 (1.19)
5. I find online learning system useful in my study completion.	2.2 (1.28)
PSQ: When I register for online courses, I expect	2.72 (1.70)
1. To have adequate feedback and support services from faculty	2.73 (1.29)
2. To have adequate information and support services from institutions	2.72 (1.3)
3. To have adequate support services from student service coordinators	2.7 (1.31)
Online learning acceptance and satisfaction (OLAS)	2.14 (1.57)
1. If I need to study for advanced degrees (programs), I would expect to use the online learning system.	2.11 (1.25)
2. If asked, I would likely recommend the online learning system as an ideal learning platform.	2.06 (1.22)
3. For future advanced degrees (programs/certificates), I would probably use the online learning system.	2.21 (1.28)
4. Overall, I am satisfied with the online learning system.	2.18 (1.27)
Age (years old)	20.51 (1.42)