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Original Article

Evaluation of Students' Perception of E-Learning Education Atmosphere (EEAM) in a Private Dental College in Pakistan

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ABSTRACT

Objective: To assess the e-learning educational environment of our institute using a tool called the E-learning educational atmosphere measure (EEAM).

Study design: Cross-sectional study.

Place and Duration of Study: Rehman College of Dentistry, Peshawar Pakistan, from Oct 2020 to Mar 2021.

Methodology: A pre-validated EEAM questionnaire comprising seven domains was used as a data collection tool. The questionnaire was distributed among all the Rehman College of Dentistry students, Peshawar and the response was obtained. All questions were assessed on a five-point Likert scale ranging between one and five.

Results: A total of 161 students were included, with a response rate of 80.1%. The mean age of the students was 21.54±1.38 years, (range: 21-23 years). Responses to questions of all first five domains of awareness of rules, safety and convenience, teaching quality, learner support, ethics, and professionalism mostly were towards agreement and strongly agreement side. The responses to questions 41 and 42 of the program effectiveness domain and 44 and 45 of the knowledge, affective and psychomotor domain were mainly towards the disagreement side.

Conclusion: The colleges should concentrate on introducing new strategies to improvise the program's effectiveness along with better teaching of affective and psychomotor skills. They should target the senior classes and the female tutees by educating them about the pros and cons of online learning and its dynamics to achieve better outcomes and results.

Keywords: Educational atmosphere; Educational environment measure; Online learning.

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INTRODUCTION

Globally, E-learning has been used for a long time, but it has become a necessity today, especially in the COVID-19 era.[1,2] Literature review reveals that the educational environment is measured using various tools.[3] Student perceptions about E-learning have been observed previously, but no proper tool or instrument is developed to measure the E-Learning educational environment holistically.[4,5]

Till now, only one institute endeavoured to develop an E-learning atmosphere measuring (EEAM) tool, but that too is applied at postgraduate level only.[6] Keeping the differences between face-to-face and virtual situations in mind, we need to make a specific instrument or make amendments if required to existing tool, as per our circumstances, and apply it at undergraduate level as well.[7,8]

Evaluating the educational environment in E-learning environment by EEAM may give administrators and stakeholder beneficial information to establish an effective education system by focusing on the essential changes and pave way towards improvements in future and continuing the productive strategies. To keep this objective in mind, we planned this study to assess the E-learning educational environment of our institute with a tool called the E-learning educational atmosphere measure (EEAM).

METHODOLOGY

The cross-sectional study was conducted from October 2020 to March 2021 at Rehman College of Dentistry, Peshawar Pakistan, after approval of the Institutional Ethical Committee (EC Ref number: 2020-11-039).

Inclusion Criteria: Students of either gender, aged 18-24 years, from first to final year, who were attending online classes during the COVID-19 pandemic, were included in the study.

Exclusion Criteria: Students who did not respond despite three reminders were excluded.

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One hundred sixty-one students were included in the study after obtaining informed consent. Online Google Form linked to E-learning atmospheric measure was used as a data collection tool. The questionnaire comprised seven domains. Out of these domains, six were pre-validated and tested already. They were modified for use in our study after permission from the author.[3] A seventh domain was added, taking care of the peculiarities of our set-up. Cronbach's alpha for the new domain was assessed and found to be 0.8%. The final instrument contained 47 items covering seven domains (Table-I).

All questions were assessed on a five-point Likert scale ranging between one and five, depicting an opinion of strongly disagree, disagree, neutral, agree, and strongly agree. Data analysis was done using Statistical Package for the Social Sciences (SPSS) version 26. Mean and standard deviation were calculated for quantitative variables, while frequency and percentage were calculated for qualitative variables.

RESULTS

A total of 161 students were included, with a response rate of 80.1%. The mean age of the students was 21.54±1.38 years, with a range of 21-23 years, and included 74(46%) females and 87(54%) males.

Frequencies and percentages for all questions of the seven domains are shown in Table-II. Responses to questions of all first five domains of awareness of rules, safety and convenience, teaching quality, learner support, ethics, and professionalism mostly agreed and strongly agreed. The responses to questions 41 and 42 of the program effectiveness domain and 44 and 45 of the knowledge, affective and psychomotor domain

Table-I: Factors and Respective Items related to E-learning Educational Atmosphere Tool

Domains	Question No.	Items
Awareness of the rules	1	"There is a good place for e-learning in my society."
	2	"I have become aware of educational regulations and administrative processes."
	3	"There are clear guidelines and style sheets for using educational and research facilities and systems."
Safety and convenience	4	"I can easily work with LMS."
	10	"I don't feel lonely in my learning environment."
	15	"I feel comfortable in order to ask my questions."
	18	"Content types and activities match with my learning style."
	47	Internet facility is conveniently available in my vicinity.
Teaching quality	5	"Teachers of this program cover teaching process within LMS."
	22	"Teachers of this program have e-teaching skills."
	23	"Teachers of this program take help from accessible educational services for better e-teaching."
	25	"Teachers of this program give timely feedback on my assignments, activities and messages."
	26	"Teachers of this program give me complete and proper feedback on my assignments, activities and messages."
	27	"Teachers of this program use different methods (such as chat room, group assignment etc.) to encourage group activities and engage students in virtual environment."
	28	"The timing of delivering courses' resources and activities during the semester is appropriate for me."
	31	"Teachers of this program care about students' views on how to present their courses and activities."
Learner support	6	"Given the virtual feature of the program, there is sufficient flexibility in administrative processes (e.g. number of units per semester, maximum permitted duration of the program etc.)
	7	"Administrative educational staff and authorities are well responsive to me."
	8	"Technical support staff and authorities are well responsive to me."
	9	"If necessary, I have access to an academic adviser."
	11	"There are good supports for top students."
	12	"There are good supports for weak students."
	13	"I have access to a decent digital library."
	21	"Course plans are clear and available."

	30	"Students' views on the program delivery and educational services are considered important."
Ethics and Professionalism	14	"Teachers of this program help raise my motivation for learning."
	16	"Teachers of this program are responsive and available"
	17	"Teachers of this program try to make sure about my learning."
	24	"Teachers of this program have good and up-to-date academic ability."
	33	"Copyright and intellectual property of scientific resources and contents are respected."
	34	"Cultural issues and social etiquette are observed in the educational environment."
	35	"Relationships governing the educational environment are with respect and courtesy."
Program effectiveness	19	"Courses' resources and contents are intriguing and motivational for learning."
	20	"The possibility of learning academic meta-skills (such as writing a proposal, working with academic software etc.) is provided for me."
	29	"Courses' contents and activities are understandable and tangible"
	32	"Teachers assess the students pretty well in various courses."
	37	"It's easy for me to study and do my assignments and activities."
	40	"During studying this program, my ability to interact with others in virtual space has increased."
	41	"I have learned what I needed to learn in this program."
	42	"This program will prepare me for my future job."
	43	"I am satisfied with studying in this virtual program."
Knowledge, Psychomotor and affective domain including teaching and assessment	44	Online Sessions are helpful in teaching, learning and assessment of the clinical skills (psychomotor domain).
	45	Affective domain (attitude/Behavior) is taught, learnt or assessed through online classes.
	46	Knowledge (information/content) is taught, learnt and assessed through Online classes.

Table-II: Response of students to E-Learning questionnaire (n=161)

Questions	**Response n(%)**				
Domain-1					
(Awareness of the rules)	1	2	3	4	5
Q.1	17(10.6)	27(16.8)	55(34.2)	49(30.4)	12(7.5)
Q.2	9(5.6)	24(14.9)	58(36.0)	60(37.3)	8(50)
Q.3	8(5.0)	30(18.6)	59(36.6)	52(32.3)	11(6.8)
Domain-2					
(Safety and convenience)	1	2	3	4	5
Q.4	10(6.2)	32(19.9)	58(36.0)	44(27.3)	16(9.9)
Q.10	17(10.6)	17(10.6)	60(37.3)	55(34.2)	12(7.5)
Q.15	9(5.6)	30(18.6)	68(42.2)	44(27.3)	10(6.2)
Q.18	9(5.6)	27(16.8)	44(27.3)	60(37.3)	21(13.0)
Q.47	9(5.6)	17(10.6)	53(32.9)	60(37.3)	20(12.4)
Domain-3					
(Teaching quality)	1	2	3	4	5
Q.5	8(5.0)	23(14.3)	55(34.2)	53(23.9)	21(13.0)
Q.22	9(5.6)	15(9.3)	45(28.0)	67(41.6)	21(13.0)
Q.23	14(8.7)	21(13.0)	46(28.6)	47(29.2)	29(18.0)
Q.25	9(5.6)	28(17.4)	36(22.4)	59(36.6)	26(16.1)
Q.26	11(6.8)	27(16.8)	42(26.1)	50(31.1)	31(19.3)
Q.27	22(13.1)	31(19.3)	51(31.7)	39(24.2)	17(10.6)
Q.28	6(3.1)	22(13.7)	40(24.8)	77(47.8)	15(9.3)
Q.31	13(8.1)	27(16.8)	47(29.2)	56(34.8)	17(10.6)
Domain-4					
(Learner support)	1	2	3	4	5
Q.6	9(5.6)	29(18.0)	57(35.4)	45(28)	20(12.4)
Q.7	7(4.3)	33(20.5)	60(37.3)	41(25.5)	18(11.2)
Q.8	7(4.3)	32(19.9)	57(35.4)	53(22.9)	11(6.8)
Q.9	15(9.3)	37(23.0)	55(34.2)	39(24.2)	11(6.8)
Q.11	11(6.8)	20(12.4)	47(29.2)	64(39.8)	17(10.6)
Q.12	15(9.3)	17(10.6)	55(34.2)	51(31.7)	19(11.8)
Q.13	9(5.6)	20(12.4)	66(41.0)	52(32.3)	11(6.8)
Q.21	5(3.1)	22(13.7)	47(29.2)	65(40.4)	15(9.3)
Q.30	6(3.7)	15(9.3)	58(36.0)	63(39.1)	16(9.9)

Domain-5					
(Ethics and Professionalism)	1	2	3	4	5
Q.14	12(7.5)	30(18.6)	53(32.9)	44(27.3)	16(9.9)
Q.16	7(4.3)	26(16.1)	66(41.0)	50(31.1)	7(4.3)
Q.17	2(1.2)	16(9.9)	70(43.5)	58(36.0)	10(6.2)
Q.24	6(3.7)	30(18.6)	54(33.5)	54(33.5)	12(7.5)
Q.33	9(5.6)	19(11.8)	60(37.3)	59(36.6)	9(5.6)
Q.34	6(3.7)	27(16.8)	58(36.0)	53(32.9)	12(7.5)
Q.35	10(6.2)	19(11.8)	62(38.5)	47(29.2)	12(7.5)
Domain-6					
(Program effectiveness)	1	2	3	4	5
Q.19	10(6.2)	17(10.6)	65(40.4)	52(32.3)	10(6.2)
Q.20	3(1.9)	21(13.0)	60(37.3)	57(35.4)	14(8.7)
Q.29	2(1.2)	23(14.3)	57(35.4)	62(38.5)	11(6.8)
Q.32	12(7.5)	33(20.5)	50(31.1)	54(33.5)	7(4.3)
Q.37	9(5.6)	35(21.7)	53(32.9)	50(31.1)	9(5.6)
Q.40	15(9.3)	28(17.4)	58(36.0)	43(26.7)	11(6.8)
Q.41	26(16.1)	25(15.5)	58(36.0)	38(23.6)	9(5.6)
Q.42	38(23.6)	33(20.5)	50(31.1)	31(19.3)	4(2.5)
Q.43	21(13.0)	38(23.6)	50(31.1)	40(24.8)	7(4.3)
Domain-7					
Knowledge, Psychomotor and affective domain including teaching and assessment	1	2	3	4	5
Q.44	1(0.6)	40(24.8)	34(21.1)	61(37.9)	25(15.5)
Q.45	31(19.3)	48(29.8)	64(39.8)	16(9.9)	2(1.2)
Q.46	24(14.9)	53(32.9)	37(23.0)	24(14.9)	19(11.8)

DISCUSSION

The E-learning educational atmosphere measure (EEAM) questionnaire containing forty-seven five-point Likert form items was finalized and used to record students' general perceptions regarding online learning. It comprised of seven factors: recording program effectiveness, teaching quality, ethics & professionalism, learner support, safety and convenience, awareness of the rules, along with knowledge, psychomotor and affective domain.[9,10]

Teaching quality embraces tutors' e-teaching skills, i.e., applying multiple virtual instruction approaches, giving timely and constructive feedback, correctly planning coursework and curricular events, and achieving the learning objectives within the LMS. In another survey, 'ongoing and pertinent feedback' has been mentioned as the 'active learning' measure.[11] In this study, E-teaching skills and the practice of cybernetic training aides, i.e. interactive forums, online lessons, etc., have not been included in evaluating the e-learning atmosphere.[12] This could be rooted to the fact that LMS was not planned in the current manner at that period. This element was not thought to be clear in these studies. However, nowadays, preparing the content and learning activities & providing appropriate feedback are the leading tasks for e-teachers.[9] Feedback in e-learning is an imperative aspect in aiding pupils to reflect and boost their own performance.[13]

The third domain in this study includes ethics and professionalism, which observes the copyright and intellectual ownership of resources, respecting cultural and social norms, aspects related to the educational environment, the responsivity and accessibility of teachers, and the increasing motivation to learn. Ethics were also emphasized by other researchers like the work done by Mousavi *et al*.[3] The fourth domain, i.e. learner support, involved observing the support for high achievers and weak apprentices, provision of academic counselling, responsibility of educational and supportive personnel, accessibility to the digital library, student-centred managerial process, and addressing learners' apprehensions on the available facilities. As previously studied, the standards of 'student support' and 'task orientation' have been anticipated.[14,15] Likewise, an aspect of 'support of the instructor' has also been proposed.[16]

One observation in this study was that the receptiveness to the e-learning mode of instruction is linked to the pupils' college years. Junior-year students

are inclined to be keener in accepting e-learning. The associations amongst some variables (age, number of online courses taken) propose that senior-level scholars have been engaged in fewer online classes. It was observed that the first- and second-year students were more contented in the E-learning atmosphere than students of senior classes. This could be because the third and final-year students passed through conventional teaching for numerous years and have now entered clinical clerkships. Therefore, their learning habits have not only developed but also strengthened. Besides, clinical clerkships are composed of a hands-on practical experience rather than an e-learning one.[17,18] As students of earlier years are not exposed to patients as they are mainly learning basic sciences, their interest in e-learning can be anticipated. This is in sharp comparison to another study conducted on Thai students where older, senior-level students have attended fewer online classes yet tend to adopt e-learning more than when compared to junior, first-year students.[19,20]

This study offers some practical implications for medical colleges in Pakistan. Firstly, if e-learning is aimed to be encouraged, the colleges should target junior or senior students. The colleges should improve students' perception of online education by educating them about its pros, cons, and dynamics for success.

In this study, EEAM has been further enhanced to include 'Knowledge, Psychomotor and affective domain including teaching and assessment', which can be used to explain the student's perception of the educational environment in an e-learning setting, which is the educational atmosphere. This tool is suitable for current e-learning courses, which are interactive ones, and applies a wide range of strategies for enhancing teaching–learning processes. However, since the study's theoretical framework had been conducted within the context of the virtual undergraduate program, it is suggested that additional studies explore the suitability of applying EEAM for undergraduate medical and dental programs more precisely.

LIMITATIONS OF STUDY

A few limitations of our study were that constructs of acceptance of e-learning scale can still be improved further. Moreover, the study could have been broader and conducted on several institutes for comparison and elaboration on results. The present study was done at a private dental college in one province, including high- or upper-middle-income students. If the study was conducted in all provinces, including government colleges, the results would be more generalized and applicable.

CONCLUSION

To improve the e-learning environment, the colleges should introduce new strategies to improve the program's effectiveness and better teach affective and psychomotor skills. They should target the senior classes and the female tutees by educating them about the pros and cons of online learning and its dynamics to achieve better outcomes and results.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

ZA & KG: Data acquisition, data analysis, drafting the manuscript, critical review, approval of the final version to be published.

FN & WH: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

MD & HU: Concept, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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