

ORIGINAL ARTICLE

IJPHY

Current Knowledge, Perception and Practice of E-learning among Physical Therapy Academicians in Karnataka, India¹Ajith Soman²Baranitharan Ramamoorthy³Dhanesh Kumar K U⁴Khalid Alkhatami⁵Haripriya Santhakumar**ABSTRACT**

Background: In India, most of the physical therapy teaching institutions have traditionally used the conventional method of teaching because physical therapy is closely related to skills that were considered to be possible to teach only through hands-on training. But in recent times, because of the COVID-19 pandemic, which affected all walks of life in India and worldwide, educational institutions were forced to implement education through e-learning. The study's primary objectives were to investigate physical therapy academicians' perceptions of e-learning and experience with technology and computers, identify differences in perceptions among faculty members, and identify the significant challenges and obstructions facing the implementation of e-learning.

Methods: A cross-sectional survey was carried out among physical therapy academicians using a proper sampling frame obtained from a list of teaching institutes in Karnataka, India.

Results: 32.5% of participants had no experience with course management systems, and 24.5% had low experience. 47.1% had no experience, and 35.4% had low experience in teaching via e-learning. 36.8% disagreed, and 39.6% disagreed strongly that they were satisfied with using e-learning for teaching. 28.3% disagreed, and 15.1% disagreed strongly that e-learning courses were easy to manage.

Conclusion: Most academicians had the knowledge, willingness, and confidence to execute an e-learning program if given the opportunity, though some training and administrative support is warranted to ensure that they become highly competitive in executing such a program.

Keywords: Web-based learning, Technology, Challenges, Physical Therapy, Academicians, COVID-19 pandemic.

Received 09th May 2021, accepted 04th August 2021, published 09th September 2021



www.ijphy.org

10.15621/ijphy/2021/v8i3/1051

²Lecturer, Department of Health Rehabilitation, College of Applied Medical Science, Shaqra University, Kingdom of Saudi Arabia. E-mail- baranipt@gmail.com

Orcid ID: <https://orcid.org/0000-0002-4189-7307>

³Professor, Nitte Institute of Physiotherapy, Nitte University Karnataka, India. E-mail- dhaneshphysio@yahoo.co.in

Orcid ID: <https://orcid.org/0000-0001-9200-521X>

⁴Assistant Professor, Department of Health Rehabilitation College of Applied Medical Science, Shaqra University, Kingdom of Saudi Arabia. E-mail- kalkhthami@su.edu.sa

Orcid ID: <https://orcid.org/0000-0002-7630-5471>

⁵Associate Professor, Laxmi Memorial College of physiotherapy, Karnataka, India.

Email-haripriyaajithsoman@gmail.com

Orcid ID: <https://orcid.org/0000-0002-9971-8148>

CORRESPONDING AUTHOR¹Ajith Soman

Assistant Professor, Department of Health Rehabilitation, College of Applied Medical Science, Shaqra University, Kingdom of Saudi Arabia. E-Mail: ajithsoman78@gmail.com, ajithsoman@su.edu.sa

Orcid ID: <https://orcid.org/0000-0001-9890-2552>



INTRODUCTION

Electronic learning or E-learning is a term introduced by Jay Cross, the Internet Time Group founder, in 1998 [1,2]. The term has gained popularity over the past decades, especially in recent times, in the background of the COVID-19 epidemic. E-learning, which is based on the availability of web-enabling and electronic technologies, is gaining a foothold in education all over the world. A substantial boost was given to e-learning by the advances in network and internet-centric computing. This led to the expansion of traditional learning methods into a new, dynamic, technology-based learning model through web and electronic technologies [3].

E-learning systems are not very different from traditional teaching systems, but they are executed using electronic resources. E-learning can be defined as delivering education in an easy and flexible way by using the internet and web-based technology to support learning in individuals or groups of people. Many developed and developing countries have adopted e-learning and implemented it for teaching and learning. The different ways of utilization of e-learning would be a complete dependency on it through learning management systems (LMS), blackboard teaching-learning combined with e-learning, and blended e-learning [4].

Teaching with the help of the internet and computers is the major component of e-learning, based either inside or outside classrooms. A transfer of knowledge and skills happens in e-learning in a network-enabled mode, and education is delivered to a more significant number of recipients simultaneously or in a time-phased manner. E-learning delivery involves text, video, audio, animation, images, and visual effects that facilitate learning and the outcome of learning [5]. However, in the initial period after its inception, the acceptability of e-learning was low because of the assumption that this system was lacking in the human element, which is teaching and learning requirements.

In India, most of the physical therapy teaching institutions have traditionally used the conventional method of teaching because physical therapy is closely related to skills that were considered to be possible to teach only through hands-on training. But in recent times, because of the COVID-19 pandemic, which affected all walks of life in India and worldwide, educational institutions were forced to implement education through e-learning. In this context, establishing e-learning programs of high quality became a priority for physical therapy institutions. Therefore, understanding the factors that influence the efficacy of an e-learning program is important to design and implement such a program that can optimize the teaching-learning process even under circumstances where students cannot attend conventional classroom lectures.

The present study was designed to investigate physical therapy academicians' perceptions of e-learning in Physical Therapy institutions in Karnataka, South India, and the

factors influencing their perceptions. Karnataka is a state of India which is home to a sizeable number of physical therapy education institutions; a study covering the academicians of Karnataka would be adequately representative of the information from academicians all over India. In addition, this study examined faculty members' experience with technology and computers and identified differences in perceptions among faculty members. Finally, this research identified the significant challenges and obstructions facing the implementation of e-learning by physical therapy academicians. Karnataka is a south Indian state in which many Physical Therapy institutions are located, affiliated to the Rajiv Gandhi University of Health Sciences and a few deemed universities.

MATERIALS AND METHODS

The study was a cross-sectional survey carried out among physical therapy academicians, both men, and women, working at selected teaching institutions in Karnataka. A total of 212 volunteers from various institutions participated in the study. The sampling technique employed was simple random sampling, using sequentially numbered envelopes so that all faculty members had an independent chance of being selected to be a participant in the study. Thus, 233 faculty members were randomly selected from this population for voluntary participation in this study. The faculty members were contacted using the e-mail addresses obtained from the institutions. Among these, 212 (91%) of selected persons responded with the completed survey. As a result, ethical approval was obtained from the Institutional Ethical Committee (Ref No. NIPT/IEC/24/8/20).

The Survey Tool

A survey questionnaire with four main sections was used for the data collection of this study. Section 1 included demographic information and current knowledge about e-learning; section 2 contained technology and computer experience knowledge. Section 3 comprised faculty members' perceptions of e-learning. Finally, section 4 dealt with the potential challenges concerning e-learning.

Section 1: Demographic information

This section consisted of personal information, such as gender, age, education level, and teaching experience of the faculty member.

Section 2: Knowledge of technology and computer experience.

This section of the questionnaire comprised questions 1-8 and was based on a scale developed by Liaw, Huang, and Chen(2007) [6]. It was designed to identify the experience of the faculty members with computer and e-learning software. This scale contained eight items designed to measure faculty members' experience with technology and computers. The items covered teaching with computers, internet use, e-mail use, and e-learning experience. It used a five-point response scale for each answer, with a score of 1 indicating no experience and 5 indicating high-level experience.

Section 3: Faculty members' perceptions of e-learning

This section of the questionnaire was developed by Liaw et al. and Liaw (2008) and was designed to understand instructors' perceptions of e-learning [6,7]. This part, comprising of 10 items, was modified by updating some statements. The section consisted of items like perceived enjoyment, perceived self-efficacy, behavioral intention to use e-learning, perceived usefulness, multimedia instruction, and perceived system satisfaction. A five-point Likert response scale was used for each item [8]. The following were the numbers used for scoring: five indicated strongly agree, four was agreed, three indicated that the participant was uncertain, two disagreed, and one strongly disagree.

Section 4: Perceptions of e-learning challenges being faced by physical therapy academicians in India

This section was designed to identify e-learning challenges facing academicians in Indian teaching institutions [9]. The section included a list of obstructions and challenges facing faculty in the institutions in India when using e-learning. This section consisted of 8 items and used a five-point Likert-type scale, with a scoring system similar to that used in section 3.

The validity of the questionnaire was assessed by an experienced panel of academicians and researchers. Based on the panel suggestions, several items were revised, and the survey was then sent to the other panel members, who reviewed it several times. Finally, content validity and face validity were evaluated, the suggested changes were made, and the new draft was reassessed by all panel members, who accepted the face and content validity of the survey as being adequate.

Data collection procedure

Two hundred thirty-three faculty members were randomly selected for participation in the study from physical therapy teaching institutions in Karnataka, South India. E-mail invitations were then sent to these 233 potential participants in April 2020. The e-mail invitation included a link for an online survey for the participants, as a Google questionnaire, and they were instructed to follow the link to the online survey. In addition, we contacted each institution's principal/ head to consider promoting the online survey among their faculty. The respondents completed the questionnaire on their own to ensure that their privacy was not breached and that confidentiality was maintained.

Furthermore, the respondents were not required to include their names in the completed questionnaire to enhance confidentiality and privacy. As a result, the survey could be completed in approximately 10-15 minutes. To increase the response rate of participants, in the second week, an e-mail reminder was sent along with a hyperlink of the online survey.

RESULTS

A total of 212 participants, 109 males (51.4%) and

103 females (48.6%), responded to the invitations and participated in the study. Thus, the response rate was 91%. Table 1 depicts the demographic characteristics of the physical therapists who participated in the study. A majority of the participants had more than six years of teaching experience (76%). In addition, Ph.D. holders were 5.7% of the sample, 89.6% were master degree holders, and 4.7% were bachelor degree holders.

Table 1: Demographic characteristics of participating physical therapists

S. No.	Characteristics	N	%
1	Age		
1.1	Between 25-30	69	32.5
1.1	Between 31-35	47	22.2
1.2	Between 36-40	39	18.4
1.3	Between 41-45	40	18.9
1.4	Between 46-50	17	8
2	Gender		
2.1	Male	109	51.4
2.2	Female	103	48.6
3	Highest academic degree		
3.1	Bachelor in Physical Therapy	10	4.7
3.2	Masters in Physical Therapy	190	89.6
3.3	Ph.D	12	5.7
4	Teaching Experience		
4.1	Between 0-5	51	24
4.2	Between 6-10	66	31.1
4.3	Between 11-15	65	30.7
4.4	16 or more years	30	14.2

Table 2 depicts the participating physical therapist-academicians' experience in the fields of technology and computers. The moderate experience was observed in operating systems and the internet, 41.5%, and 48.6%, respectively. 32.5% of participants had no experience in course management systems for e-learning, 24.5% had low experience, and 24.5% had average experience only. 47.1% had no experience teaching via e-learning, 35.4% have low experience in teaching via e-learning. In word processing packages and presentation software, moderate to high experience was seen. Only a scanty percentage was highly experienced in course management systems like Blackboard, Moodle, and other software.

Table 2: Experience of participants in technology and computers.

S.N	Questions	Levels									
		No experience		Low experience		Average experience		Moderate experience		High experience	
		No:	%	No:	%	No:	%	No:	%	No:	%
1	Operating Systems*	5	2.4	13	6.1	75	35.4	88	41.5	31	14.6
2	Internet	0	0	3	1.4	32	15	103	48.6	74	35

3	Word processing packages*	3	1.4	11	5.2	49	23.1	66	31.1	83	39.2
4	Presentation software*	3	1.4	3	1.4	34	16	86	40.6	86	40.6
5	Course management system for e-learning*	69	32.5	52	24.5	52	24.5	28	13.3	11	5.2
6	Video conferencing tools*	0	0	13	6.1	49	23.1	89	42	61	28.8
7	Online chat programs*	0	0	3	1.4	34	16	103	48.6	72	34
8	I have the necessary experience to teach via e-learning	100	47.1	75	35.4	14	6.6	15	7.1	8	3.7

*Operating Systems- Windows, mac OS, Ubuntu, Fedora, Free BSD, etc.

*Word processing packages - MS office, Google DOCS, Apple iWork, A Byword, Corel Word Perfect, etc.

*Presentation software - Microsoft PowerPoint, Keynote, Media Shout, Open Office Impress, Harvard Graphics, etc.

*Course management system for e-learning - Canvas, Moodle, Blackboard, Google Classroom, Schoology, Quizlet, etc.

*Video conferencing tools - Zoom, Skype, Microsoft Teams, Webex Meetings, Google Hangouts, etc.

*Online chat programs - Facebook chat, Hubspot, Podium website, Yahoo, Olark, etc.

Table 3 represents faculty members' awareness or perception of e-learning. A good proportion (64.6%) agreed that they could teach a successful e-learning course; only 9.9% strongly agreed, 1.4% agreed that they were satisfied with using e-learning tools in their teaching, and 39.6% strongly disagreed 36.8% disagreed with the same statement. 38.2% were neutral, and 21.7% disagreed that practical skills could be imparted through e-learning platforms. Many disagreed or were neutral (28.8% and 36.8%, respectively) about whether e-learning modalities could replace classroom learning.

Table 3: Participants perception of e-learning

S.N	Questions	Levels									
		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		No:	%	No:	%	No:	%	No:	%	No:	%
1	I feel confident that I can teach a successful e-learning course	0	0	0	0	37	17.5	137	64.6	38	17.9

2	I feel confident that I can teach a successful e-learning course	0	0	20	9.4	72	34	94	44.3	26	12.3
3	I enjoy using computers in my teaching	0	0	0	0	31	14.6	143	67.5	38	17.9
4	E-learning is an effective medium for learning	0	0	17	8.1	88	41.5	84	39.6	23	10.8
5	I can teach effectively through E-learning	0	0	20	9.4	72	34	94	44.3	26	12.3
6	I can communicate efficiently through e-learning	6	2.8	29	13.7	63	29.7	86	40.6	28	13.2
7	I am satisfied with using e-learning tools in my teaching.	84	39.6	78	36.8	26	12.3	21	9.9	3	1.4
8	I like to use voice, image and animation media instruction	6	2.8	43	20.3	92	43.4	56	26.4	15	7.1
9	Practical skills can be imparted through E-learning platforms	15	7.1	46	21.7	81	38.2	58	27.4	12	5.6
10	Classroom learning can be replaced by E-learning	32	15.1	61	28.8	78	36.8	35	16.5	6	2.8

Table 4 details the challenges being faced by physiotherapy academicians in India. 64.6% of the participants agreed that administrative support for e-learning is strong in their college/ department. 41.5 % of participants were neutral when asked whether the department has adequate financial resources to develop technology-based initiatives. 21.6% of the faculty disagreed that their college /department has time to adopt e-learning. Many participants strongly disagreed (15.1%) or disagreed (28.3%), and 37.7 were neutral for the statement that the faculty members in their department/ college believe it is easy to manage an e-learning course.

Table 4: Challenges being faced by physiotherapy academicians.

S.N	Questions	Levels									
		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		No:	%	No:	%	No:	%	No:	%	No:	%
1	Administrative support for E-learning is strong at my college/ department	0	0	0	0	37	17.5	137	64.6	38	17.9
2	Faculty members have time for e-learning training	37	17.5	57	26.9	69	32.5	29	13.7	20	9.4
3	My college/ department has adequate financial resources to develop technology-based initiatives..	0	0	17	8	88	41.5	83	39.2	24	11.3

4	Faculty members must spend extra time to create e-learning courses	0	0	26	12.3	58	27.3	57	26.9	71	33.5
5	Faculty members have access to hardware essential for teaching E-learning courses	0	0	20	9.4	71	33.5	95	44.8	26	12.3
6	Faculty members have access to software essential for teaching E-learning courses.	3	1.4	26	12.3	83	39.2	80	37.7	20	9.4
7	Faculty members in my department/college have time to adopt E-learning.	14	6.6	46	21.6	83	39.2	57	26.9	12	5.7
8	Faculty members in my department/college believe it is easy to manage an E-learning course.	32	15.1	60	28.3	80	37.7	34	16.1	6	2.8

DISCUSSION

To our knowledge, this is the first study conducted in India to investigate the Knowledge, Perception, and Practice of E-learning among Physical Therapy Academicians. The results illustrate the present knowledge, perception, and practice of e-learning among Physical Therapy Academicians in the Karnataka state of South India. In this article, e-learning is defined to include all forms of teaching which are electronically mediated or as teaching and learning facilitated by communication and information technology, both outside and inside the classroom [10]. E-learning became most popular during the COVID-19 pandemic because many academicians were working from home, and almost all students were learning from the safety of their homes.

The COVID-19 pandemic proved to be a substantial disruption of the scheme of things with tough challenges for all educational systems, including physical therapy [11]. At the same time, it brought forward a substantial opportunity for all the academicians and students to adopt newer techniques that are more suitable for the present generation of learners [12]. Today's teachers are mostly computer educated, and the era today is of the internet, so teaching from home is a viable alternative to classroom teaching if the situation demands it. The institutes can meet the demands of the present time by providing the teachers free access to and training in a few paid e-learning platforms or academic article databases, which can be accessed from their homes [13].

That said, it is vital to understand the factors that affected the effectiveness of e-learning and devise strategies to make sure that the teaching-learning process continues effectively even if students cannot come into the classroom to learn. Though a large percentage of participants had several years' experience in teaching physiotherapy

students, it was notable that a very meager percentage had any experience in teaching e-learning modules, especially when it came to course management systems like Blackboard and Moodle. Similarly, a tiny percentage strongly agreed that they were satisfied with using e-learning in their teaching. There appears to be a gap in the knowledge and experience of e-learning systems among Indian physiotherapy academicians. Of the participants in the present study, many had no experience or had low experience (32.5% and 24.5% respectively) about knowledge about course management systems for e-learning. 47.1% had no experience, and 35.4% had low experience in teaching via e-learning; this information is crucial and indicates the lack of experience among teachers in e-learning. A majority agreed that they are confident about teaching a successful e-learning course. Still, they were neutral in their statement when asked whether e-learning is an effective medium for learning, which may be because of a lack of experience in using e-learning platforms. Many were neutral (34%), and a few disagreed (9.4%) that they could teach effectively through e-learning. Only 27.4% agreed that practical skills could be imparted through e-learning platforms, and only 16.5% agreed that classroom learning could be replaced by e-learning. This is possibly indicative that advanced training of academicians in primary e-learning platforms might go a long way in ensuring effective delivery of e-learning in physiotherapy. Even after students start attending physical classes, e-learning system knowledge might be an invaluable asset for teachers to gain the best of both worlds, namely physical and online teaching.

Acquiring practical skills requires hands-on experience, which requires traditional face-to-face teaching. That could be why many participants disagreed that practical skills could be acquired through e-learning. However, in a situation like that imposed by the COVID-19 pandemic, it is impossible to teach skills indirectly, so developing a tool to teach practical skills through e-learning is warranted.

When teaching practical training through e-learning, visuals and live demonstrations can give a better output. Students learn in many different ways – visual, auditory, and kinaesthetic. By delivering information online, academicians have to ensure that they enable all the different types of learners to engage with their teaching. Providing visual diagrams, animations, and dot-pointing information can all help alongside a video showing a real-life demonstration of the skill in a situation or environment that is as close to the learner's workplace as possible. This concept has been used for a long time in cooking shows where close-up shots of the food being prepared and cooked give the viewer an excellent practical lesson on how the dish is made. When visual input is provided, there is a better chance of learning than when one just listens or reads about it.

The trend in pedagogy and andragogy for theoretical content has the potential to be shifted from monotonous didactic lectures to interactive online lectures using

video conferencing tools (e.g., Google meet, Microsoft teams, Zoom, etc.); reading and writing assignments can be done using various teaching-learning apps such as Google classroom; class-presentations can be replaced by uploading of pre-recorded presentations on social media platforms [14].

In implementing the e-learning program, academic staff faces challenges like financial support to develop technology-based initiatives and access to hardware essential for teaching e-learning courses. Many of the faculty members disagreed (12.3%) or were neutral (39.2%) to the statement about whether they have access to software essential for teaching e-learning courses. The technological infrastructure in the form of hardware and software is mandatory to run an e-learning program. The issues related to hardware are cost, shortage of units, and lack of technical knowledge to operate them [14,15]. The software issues include obtaining licenses [16] and frequent up-gradation of hardware required to support them. Round-the-clock access at both home and off-campus is necessary for e-learning to have maximum impact. Even if the infrastructure is present, the technical support to run the system, awareness about the support materials, and quick solutions to the technical glitches are lacking [17, 18]. The trainers are frequently not aware of the type of support required in particular programs. Previous studies on this subject have surmised that awareness about computer technology and competency and proficiency in the usage of computers at learners' level is 'a must' to adopt this technology [19].

Many of the academicians of the present study disagreed or were neutral about whether the faculty members in the department/college have time to adopt e-learning. Health educators are under pressure to find sufficient time to teach, research and maintain a work-life balance honoring personal life commitments[20]. In this context, inadequate time to devote to the mastery, development, and implementation of online learning tools can be seen as a significant barrier. This expectation of time to be invested can be seen as detrimental to an educator's pedagogical system in conjunction with preconceived notions about computer-based tools "always taking longer than expected" [21]. On the other hand, the adoption of digital tools can free up time allowing medical educators to learn concepts and reflect on practices [22].

Furthermore, where educators are asked to spend time engaging with the development or implementation of online learning, it is proposed that there be a 'formal mechanism for faculty reward and acknowledgment for efforts [23]. Finally, obeying the rules of personal time management, which are widely described in the literature, is the basis of successful learning or teaching process. One who cannot efficiently organize their time will not have sufficient time for learning or teaching, which will cause a deterioration of the quality of teaching and learning [24-26].

An efficient method of conducting online examinations

without excessive efforts on the examiner's part and malpractice by the student was a concern that many academicians expressed. A good number also felt that practical training and exposure to clinical scenarios took a back seat in e-learning. Very few appeared to be convinced that practical skills could be learned through e-learning platforms. Students being ill-adapted for e-learning, teachers not being formally trained well enough, and institutions not providing enough infrastructure and financial support were all issues that came up frequently as needed addressing.

Online examinations can be made more effective by remodeling them to be more reliable, valid, flexible, and secure, promoting learning better and aligning with the learning outcome intended by the educator. Such successful implementation needs support from the institution, which would include creating suitable conditions for conducting examinations online, facilitating procedures of administrative nature, upgrading the required infrastructure, providing financial support as necessary, guiding the academic staff to overcome any pedagogical or technical issues they may face, and building up the capability of academic staff members (Shraim 2019). [27]

Other problems the participant academicians perceived as possibly hindering the application of e-learning in physiotherapy included e-learning as a teaching system lacking the ability to modify the students' grooming, attitude, and psychomotor developments. Though this is indeed a valid concern in imparting e-learning, some other aspects that teachers are worried about can be addressed during online classes by using simulated patients or role-plays. For example, history taking, communication skills, and clinical reasoning can be imparted in this manner. Other ways in which clinical skills can be transferred with some amount of efficacy are by sharing pre-recorded or live videos of clinical skills demonstration and laboratory procedures (Mukhtar 2020). [28]

Many academicians felt that eye problems could occur due to online classes and students' excessive use of the internet and smartphones. In addition, the possible non-availability of high-speed internet connectivity and access to smartphones and computers for all students was also a concern many academicians expressed. Therefore, there is a need to address these issues if the optimal results are obtained from e-learning systems.

The use of the internet is widespread among physical therapy students, as with all persons of the younger generation. Adopting e-learning as an integral part of education will have far-reaching effects on the way students learn physical therapy. For this effect to be optimum and of desirable level, teaching institutions should adopt information technology and optimize its usage by teaching staff and students. A skills lab, e-library, computer room, and good internet facility can help in this optimization. Lecture rooms should ideally have live-stream classes, and faculty development and training programs should address competencies required to execute e-learning programs

efficiently. Continuously engaging in e-learning programs will help academicians develop innovative methods for training physical therapy students virtually. E-learning programs are perceived to be enjoyable and exciting enough by medical students. Still, there is a long way to go before completely replacing traditional and classroom learning [29,30].

Combining traditional classroom learning with e-learning tools, blended learning techniques can ensure that teaching and learning happen with maximum efficacy. Used wisely, even social media applications like YouTube, Facebook, and WhatsApp can be much helpful in improving the effectiveness of e-learning [31].

The advent of mobile devices and the explosion of social media technology allow learners to create their own personalized learning experiences. Therefore, academic faculty and tutors have a crucial role in guiding and supporting the effective use of technology for such learning. Most e-learning courses are developed to build cognitive skills, the cognitive domain being the most suitable for e-learning; the interpersonal domain can also be addressed in e-learning by using specific methods, but the ability to develop psychomotor skills, involving the acquisition of physical perceptions and movements, is questionable[32]. Developing e-learning is more expensive than preparing classroom materials and training the trainer, primarily if multimedia or highly interactive methods are used. However, delivery costs for e-learning are considerably lower than those for classroom facilities in terms of instructor time, participant's travel, and job time lost to attend classroom sessions, in addition to the advantage of reaching a broader target audience.

A uniform academic plan for the curriculum prepared at the institution or university level can assure that the learning process continues uninterrupted during the pandemic. Infrastructure should be provided to execute and regulate e-learning programs in anticipation of any possible situations where classroom learning can be disrupted. Such infrastructure can be made available only if adequate funding is available for providing training to develop the capacity of the stakeholders of teaching institutions. Online learning can benefit from utilizing open-source digital learning systems and other systems that can manage such learning systems so that teaching and learning optimally take place. A multi-pronged approach is undoubtedly the need of the hour to build a resilient education system that will help impart quality learning to those to aspire to it.

In conclusion, most academicians had the knowledge, willingness, and confidence to execute an e-learning program if given the opportunity. However, training and administrative support are warranted to ensure that they become highly competitive in executing such a program. Many believed that e-learning programs are satisfactory and effective in teaching-learning, though some were doubtful about the efficiency of e-learning programs to impart practical skills. According to the participants, the current administrative and financial support system for e-

learning had some room for improvement, and access to the hardware and software required for teaching via electronic programs was also somewhat lacking. The participants were also concerned about the availability of technology required to access e-learning and the inability to groom students holistically rather than merely in the cognitive area. Addressing the concerns of the academicians responsible for delivering e-learning programs can help ensure that e-learning happens smoothly and effectively, benefiting the students and satisfying the teachers.

Disclosure of potential conflicts of interest

The authors (s) declared no potential conflicts concerning this article's research, authorship, and publication.

REFERENCE

- [1] M. Zare, C. Pahl, H. Rahnama, M. Nilashi, A. Mardani, O. Ibrahim, H. Ahmadi. Multi-criteria decision making approach in E-learning: A systematic review and classification. *Appl. Soft Comput. J.* 2016; 45:108–128.
- [2] V. Sahasrabudhe, S. Kanungo. Appropriate media choice for e-learning effectiveness: Role of learning domain and learning style. *Comput. Educ.* 2014;76: 237–249.
- [3] A. Gunasekaran, R.D. Mcneil, D. Shaul. E-learning: Research and applications. *Ind. Commer. Train.* 2002;34 (2): 44–53.
- [4] Q.N. Naveed, M.R.N. Qureshi, N. Tairan, A. Mohammad, A. Shaikh, A.O. Alsayed, A. Shah, F.M. Alotaibi. Evaluating critical success factors in implementing E-learning system using multi-criteria decision-making. *PLoS One.* 2020;15(5): e0231465. <https://doi.org/10.1371/journal.pone.0231465>.
- [5] A.A.A. Qasem, G. Viswanathappa. Teachers' perception towards ICT integration: professional development through blended learning. *Journal of Information Technology Education: Research.*2016; 15: 561-575.
- [6] S.S. Liaw, H.M. Huang, G.D. Chen. Surveying instructor and learner attitudes toward e-learning. *Comput. Educ.* 2007; 49(4):1066–1080.
- [7] S.S. Liaw. Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system. *Comput. Educ.* 2008; 51(2): 864–873.
- [8] A.M. Alenezi. Faculty Members' Perception of E-learning in Higher Education in the Kingdom of Saudi Arabia (KSA). 2012. <https://ttu-ir.tdl.org/handle/2346/45399> (accessed July 26, 2021).
- [9] L. Lin, G.A. Knezek, B. O', M. Alajmi. Approved faculty members' readiness for e-learning in the college of basic education in Kuwait, University of North Texas. 2010. <https://digital.library.unt.edu/ark:/67531/metadc31523/m1/12/> (accessed December 10, 2020).
- [10] P. Dev, E.P. Hoffer, G.O. Barnett. *Computers in Medical Education*, in: Springer, New York, NY, 2006: pp. 737–762. https://doi.org/10.1007/0-387-36278-9_21.
- [11] C. Theoret, X. Ming. Our education, our concerns: The

- impact on medical student education of COVID-19. *Med. Educ.* 2020; 54(7) :591–592.
- [12] D.H. Roberts, L.R. Newman, R.M. Schwartzstein. Twelve tips for facilitating Millennials' learning. *Med. Teach.* 2012; 34(4): 274–278.
- [13] R. Bhat, V.K. Singh, N. Naik, C.R. Kamath, P. Mulimani, N. Kulkarni. COVID 2019 outbreak: The disappointment in Indian teachers. *Asian J. Psychiatr.* 2020; 50: <https://doi.org/10.1016/j.ajp.2020.102047>.
- [14] V. Rajhans, U. Memon, V. Patil, A. Goyal. Impact of COVID-19 on academic activities and way forward in Indian Optometry. *J. Optom.* 2020; 13(4): 216–226.
- [15] R.J. McAuley. Requiring students to have computers: Questions for consideration. *Acad. Med.* 1998; 73(6): 669–673.
- [16] S.M. Meyer. The adoption of technology in higher/nursing education. *Curacionis.* 2001; 24(4): 32–36.
- [17] J. Hadley, R. Kulier, J. Zamora, S.F.P.J. Coppus, S. Weinbrenner, B. Meyerrose, et al. effectiveness of an e-learning course in evidence-based medicine for foundation (internship) training. *J. R. Soc. Med.* 2010; 103(7): 288–294.
- [18] S.K. Dhir, D. Verma, M. Batta, D. Mishra. E-learning in medical education in India. *Indian Pediatr.* 2017; 54: 871–877.
- [19] R. Klamma, M. Chatti, E. Duval, H. Hummel, E. Hvannberg, M. Kravcik, E, et al. Social Software for Life-long Learning. *Educational Technology & Society.* 2007; 10 (3), 72-83.
- [20] F.C. Wilson. Teaching by residents. *Clin. Orthop. Relat. Res.* 2007; 454: 247-250.
- [21] V. Niebuhr, B. Niebuhr, J. Trumble, M.J. Urbani. Online faculty development for creating e-learning materials. *Educ. Heal. Chang. Learn. Pract.* 2014; 27(3): 255–261.
- [22] L. Dyrbye, A. Cumyn, H. Day, M. Heflin. A qualitative study of physicians' experiences with online learning in a masters degree program: Benefits, challenges, and proposed solutions. *Med. Teach.* 2009; 31(2). <https://doi.org/10.1080/01421590802366129>.
- [23] J.K. Brueckner, D.J. Gould. Health Science Faculty Members' Perceptions of Curricular Integration: Insights and Obstacles. *Medical Science Educator.* 2006; 16(1).
- [24] M. Meiers. Teacher Professional Learning, Teaching Practice and Student Learning Outcomes: Important Issues, in: *Handb. Teach. Educ.* Kluwer Academic Publishers. 2006; 409–414. https://doi.org/10.1007/1-4020-4773-8_27.
- [25] R. V. Adams, E. Blair. Impact of Time Management Behaviors on Undergraduate Engineering Students' Performance, *SAGE Open.* 2019; 215824401882450. <https://doi.org/10.1177/2158244018824506>.
- [26] M. Lincoln, B.J. Adamson, T. Covic. Teaching time and organizational management skills to first year health science students: does training make a difference?. *J. Furth. High. Educ.* 2004; 28(3): 261–276.
- [27] Mukhtar S. Psychological Health during the corona virus disease 2019 Pandemic outbreak. *Int J Soc Psychiatry.* 2020;66(5):512-516.
- [28] Shraim, Khitam. Online Examination Practices in Higher Education Institution Learner's perspectives. *Turkish online Journal of Distance Education.* 2019;20:185-196.
- [29] R. Huynh. The Role of E-Learning in Medical Education. *Acad. Med.* 2017; 92(4): 430. <https://doi.org/10.1097/ACM.0000000000001596>.
- [30] E. Warnecke, S. Pearson. Medical students' perceptions of using e-learning to enhance the acquisition of consulting skills. *Australas. Med. J.* 2011; 4(6): 300-307.
- [31] S.S. Mazloomi Mahmoodabad, A. Barkhordari, H. Nadrian, O. Moshiri, M.T. Yavari. Survey of ownership and use of mobile phones among medical science students in yazd. *Pakistan J. Biol. Sci.* 2009; 12(21): 1430–1433.
- [32] D. Ratniece. Cognitive development in active eLearning. *Int. J. Eng. Technol.* 2018; 7(2): 53–57.