Original Article

Faculty satisfaction and perception regarding emergency remote teaching : An exploratory study

Medha Anant Joshi [a], *Pushpanjali Krishnappa* [b,*],
Avinash Vasudev Prabhu [a]

[a] *Faculty (Life & Allied Health Sciences), M.S Ramaiah University of Applied Sciences, Bengaluru, India*
[b] *Faculty (Dental Sciences), Ramaiah University of Applied Sciences, Bengaluru, India*

ARTICLE INFO

ABSTRACT

Background: The COVID 19 pandemic which made its presence felt by March 2020 made the educators and administrators, both of whom had very little experience with alternate teaching and learning methods, look for alternate methods of delivering the teaching learning. Because of the mandates from apex bodies, faculty members were forced to delve into an unknown territory of Emergency Remote Teaching (ERT). This study aimed to explore the factors that contributed to faculty satisfaction for ERT, the challenges faced, and suggestions for improving online teaching.

Method: A modified survey tool to suit ERT was developed which demonstrated favourable preliminary factor analysis (Bartlett's Test of Sphericity ($p < .001$) and the Kaiser- Mayer-Olkin measure of sampling adequacy, KMO = 0.811).

Results: The EFA identified four factors, such as faculty–student interaction, faculty and IT-related, faculty training and faculty preparedness with heavy loading on faculty training, as important factors for improving faculty satisfaction for online teaching. Most of the faculty members were satisfied with the ERT. A trend of shared opinion was observed in capacity building and empowering the faculty community with full IT and course development support from the institution in the form of faculty development programmes and infrastructure development in order to equip them with emergency academic transitions.

Conclusion: The modified Survey tool was valid in identifying the faculty perceptions regarding the ERT. Faculty felt that they managed to quickly move to online teaching due to the pandemic but felt that they needed better IT support and faculty development programmes to effectively adapt to online teaching. Students, too, need to be trained for online learning, as per faculty members.

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* Corresponding author.
   E-mail address: drpushpa14@gmail.com (P. Krishnappa).

Introduction

The COVID 19 pandemic, which made its presence felt across the globe by March 2020, disrupted educational sector. The implementation of lockdown in March 2020 in India resulted in educational institutions mandating an online mode of teaching[1,2] which was new to most of the faculty in India, unlike faculty in western universities. This mandate from higher authorities compelled the faculty members to move into an unknown territory expecting early and quick adaptation. The work from home mandate placed faculty in challenging situations and also deprived the assistance that could be got by the ICT personnel to develop the online courses and use of web-based software.[3] However, faculty members quickly moved to online learning management systems (LMS) (e.g., Blackboard, Moodle), and other online platforms such as Google classroom, Microsoft Teams and Zoom to provide cognitive content. As both IHE faculty and students were new to this format, they faced a high level of anxiety and stress while doing so.[4,5] This hurried move to online teaching in response to COVID 19 pandemic suffered a major setback in terms of quality and has been labelled 'emergency remote teaching (ERT)'.[6,7] Although ERT uses same pedagogical and technological tools like online courses, the differentiating factor is the hasty transition from synchronous face-to-face teaching to virtual, technology-dependent teaching, unlike the meticulously planned and developed course content with interactions among the learners, the instructional materials, peers and the instructor in online teaching.[7,8]

Online teaching is reported to facilitate technology based innovative teaching-learning methods, and tools, flexibility in terms of scheduling the classes and the possibility of reaching out to a large number of students in remote areas who are unable to take face-to-face courses.[9] Whether the students acquire the knowledge through conventional lectures or through online mode, both lead to similar levels of learning.[10] Faculty satisfaction, one of the pillars in the Sloan Consortium's five pillars of quality online education, is an important contributor to the quality of online courses.[11,12] Even with planned online courses, faculty members face problems that lead to their perceived dissatisfaction and challenges.[13,14]

The purpose of this study was to explore the initial perceptions and experiences of faculty members working in a private state University in India practising outcome-based education with application of knowledge as the minimal level of learning, when they were directed to move to online delivery as a result of the COVID-19 pandemic.

The study was guided by the following research questions:

a) What factors contribute to faculty satisfaction in the online environment due to shifting to ERT?
b) What challenges were faced by them during ERT?
c) What are the suggestions for improving the student and faculty experience on ERT?

Materials and methods

Study design, setting and subjects

The study comprised of tool validation, survey questionnaire with closed and open-ended questions. The participants were the faculty in a State private University in India offering undergraduate, postgraduate and PhD programmes. All faculty who had shifted to ERT and taken at least one online session during March-April 2020 were included in the study. Teaching in the faculties of the University, namely, Engineering, Management and Commerce studies, Hospitality Management and Catering Technology, Art and Design, Dental Sciences, Pharmacy and Life and Allied Health Sciences were included.

The 255 faculty members at the University were sent an email with a brief note on the purpose of the research, the approximate time required for taking the survey, assuring confidentiality and anonymity and requesting their consent for participation. It was indicated that if they were willing to participate, they should take the survey through the link that indicates their consent, and after 15 days, a follow-up and reminder email to complete the survey within the next 10 days.

Study instrument

The survey was conducted using a modified version of the pre-validated questionnaire called Online Faculty Satisfaction Survey (OFSS) to assess the perceived satisfaction of faculty instructors who were regularly engaged in teaching fully online courses.[15] It had a total of 36 items, of which 28 items were close-ended with four-point Likert scale[14] including items on (a) student-related issues, (b) instructor-related issues, and (c) institutional-related issues. However, as the purpose of this study was to explore the perception among the faculty members adopting ERT, the items were appropriately modified. Three questions from the original survey related to students meeting, use of resources by students and compensation for online teaching were deleted (No. 22, 24 and 25)[15] and six new questions (No. 26 to 31) were included. Questions 27, 28, 29 and 31 were related to faculty training for using online resources. Question 26 referred to faculty facing challenges while using online platforms and question 30 referred to their preference for an asynchronous mode of teaching. The new items were based on the literature on ERT and associated factors.[16−18] The final questionnaire had a total of 42 items, of which 31 items were close-ended, and the scale of measurement for these items was a five-point Likert scale.

The survey also included six demographic items regarding the participant's faculty, age, gender, total teaching experience and prior experience in online teaching. A question related to the number of online classes taught after moving to ERT was included for determining and validating participant's eligibility. There was one question to elicit participant's familiarity with online platforms and three open-ended

questions to assess the perception related to factors that hindered and facilitated ERT. The questionnaire was then shared with subject experts in the domains of education and statistics for face validity and content validity. The content validity was assessed using Lawshe's method,[19] and a favourable CVR of >0.5 was obtained for all items. The experts for face validity reported the items to be clear with the 15−20 min time taken for completion.

Ethics clearance
Ethics clearance for the study was obtained from the Institutional Review Board of the University (EC-2020/F/PH/RP/048). Patient consent for inclusion in the study was also obtained.

Data analysis
The data were analysed for 152 responses using the JMP Pro software 16.0.0 (512257) site-id-70284357. Descriptive analyses for independent variables like faculty type, age, gender, years of experience (Table 1) was carried out and the data were tested for normalcy. For the ease of analysis, the faculty was categorised into a technical group and a non-technical group based on the use of computers as routine for activities in the curriculum, with engineering and art and design backgrounds in the former and the other five faculties in the latter. The tool violated the normal assumption with the A-D test (p = 0.6552). Analysis was also conducted with model goodness-of-fit (GFI) indices, which describe how well the proposed factor structures fit values in the study population in exploratory factor analysis (EFA). GFI indices at or above 0.95, Adjusted Goodness-of-Fit (AGFI) at or above 0.90, and Root Mean Square Error of Approximation (RMSEA) less than 0.06 were deemed satisfactory for well-fitting mode. Statistical criteria for factor loading were set as ≥0.4 (high/moderate), low cross-factor

loading close to 0.0, high/moderate reliability (>0.06), with good discrimination between the factors. Factor structures were also investigated by using multiple steps of EFA techniques, such as a criterion of Kaiser's eigenvalue (default: 1), a scree plot, and a number of factorial solutions.

The three open-ended questions were analysed using open-coding procedures and further refined by secondary and axial-coding techniques. This procedure was followed to triangulate emerging themes within the data.[20]

Results

Descriptive univariate analysis

The overall demographic characteristics of the study population are shown in (Table 1).

The total responses received was 152 of the 255 eligible population with a response rate of 60% with equal representation from male and female faculty members. There was predominant representation from the age group between 31 and 45 years. 30% of the faculty who participated in the survey had more than 15 years of teaching experience as compared to 67% without any previous experience with online teaching. 52% of them had conducted more than 16 sessions for undergraduate, postgraduate and research scholars. The mean score for each item was predominantly 2.5 and above, with an alarming score of 1.81 for item no. 7: 'I miss face-to-face contact with students when teaching online' (Table 2).

Preliminary factor analysis

A preliminary data assessment was conducted using Bartlett's Test of Sphericity (p < .001) and the Kaiser-Mayer-Olkin measure of sampling adequacy (KMO = 0.811). The sampling measure of sampling adequacy was determined (MSA). The analysis showed favourable results to proceed with further factor analysis.

Exploratory factor analysis

The data obtained for 31 items was subjected to exploratory factor analysis. The EFA with a fixed value of >0.4 and generated ten factors with an Eigenvalue of more than one (Figure 1).

For capturing the nature of the respondent's characteristics of the data, it was determined to delete ambiguously related variables (a less than 0.4 factor loading on one factor); such items were numbers 8,11, 13, 30, 23, 22, 4, 31 and 20. The cross loading factors were analysed; Item 9, 'I look forward to teaching my next fully online course' and item 10: 'My students are very active in communicating with me regarding fully online course matters', these items had cross-loading on two factors (1 and 2) with communality of less than 0.5. But deleting these items would theoretically affect the content validity of factor1; hence, it was retained in factor 1.

The results of EFA identified four factors. The model in EFA extracted the four factors from the 31 items tool, which accounted for 33.29% of the overall variance. Factor 1 accounted for 11.28%, factor 2 accounted for 10.56%, factor 3

Variable category	Variable type	N = 152	Proportion (95%CI)
Table 1 − Descriptive information of the population (n = 152).			
Faculty type	Technical group	58	38.1%
	Non-Technical group	94	61.8%
Gender	Female	77	50.6%
	Male	75	49.4%
Age Range	25−30	27	17.8%
	31−45	88	57.9%
	46−50	20	13.2%
	51−55	5	3.3%
	56−60	10	6.6%
	>60	2	1.3%
Teaching experience (years)	0 to 5	41	27%
	6 to 10	37	24.3%
	11 to 15	28	18.4%
	>15	46	30.3
Previous experience in online Teaching	Yes	17	11.2%
	No	103	67.8%
	To certain extent	32	21%
No. of sessions conducted since lock down	1 to 5	16	10.5%
	6 to 10	22	14.5%
	11 to 15	34	22.3%
	16 and above	80	52.6%

Table 2 – Mean and standard deviations for the factors.

Factor Number	Item Number	Item Description	Mean	Std Dev
1	1	Higher Interaction	2.48	0.99
	2	Flexibility and support	3.59	0.88
	7	Miss face-to-face contact	1.81	0.90
	9	Eager for the next session	3.58	0.90
	10	Active communication	3.33	0.96
	12	Student's enthusiasm	2.73	0.95
	16	Satisfied with communication tools	3.50	0.84
	17	Providing better feedback	2.94	1.01
	18	Satisfied with teaching online	2.55	0.93
2	3	Actively learning	3.28	0.91
	5	Reliable technology	3.68	0.86
	14	Technical problems	2.58	1.06
	19	Passive in contact	2.98	0.96
	21	Participation level	2.41	1.07
	24	Teaching is gratifying	4.16	0.93
	25	Motivating students	2.66	1.06
3	27	Prior training sessions	3.35	1.09
	28	Training is essential	3.77	0.89
4	15	Longer preparation hours	2.80	1.10
	6	Higher workload	2.80	1.08

accounted for 6.27 and factor 4 accounted for 5.18%. The factor 1 was named as faculty—student interaction because all items were related to faculty and student interactions, factor 2 was named as faculty and IT related as all the items were related to faculty perception related to technology and associated issues, factor 3 was named as faculty training as the items described the need for training sessions and factor 4 was faculty preparation as the items were on workload and preparation hours with Cronbach's-alpha ranging between excellent and acceptable (Table 3).

Confirmatory factor analysis

The four-factor model was derived from the current data in EFA; cross-validation of this configured construct domain was examined where the items of the data were adequately assigned. With a validation review of the model fit statistics in CFA, this current model held higher estimates (close to one) for GFI at 0.81, AGFI at 0.78 and RMSEA at 0.08 (values between 0.05 and 0.08 are acceptable for RMSEA[21] indicating reasonable model fit).

The analysis indicated the four-model factor was relatively well-fitted and could sustain the study population's underlying perceptions of online teaching.

Descriptive analysis of faculty perceptions

The obtained composite scores were categorised into highly satisfied, satisfied and unsatisfied with the range between 67-100, 34—66, and 0—33, respectively, for ease of data interpretation. The technical and non-technical groups had scores ranging from 37% to 65%, indicating their satisfaction with faculty student interaction and with IT-related matters (factor 1 and 2). They also perceived faculty preparation and faculty training (factors 4 and 3) as contributing factors to their satisfaction. The age group between 31 and 45 years were more satisfied with these factors as compared to the other groups (p ≤ 0.05). The teaching experience of the study sample ranged from 0 to 15 years and above, and all groups had lower scores for all four factors. However, the faculty with teaching experience of 15 years and above had scores almost close to 33% for all (Table 4, Figure 2).

The analysis for the association between the independent variables with a total composite score for 20 items indicated that there was a difference in faculty satisfaction between faculty type, age and years of experience, which was statistically significant (Table 5).

The majority of the respondents were familiar with Zoom and MS teams platforms, with 141 and 116 responses consecutively, and 87 and 83 for Google classrooms and GoToMeeting, respectively. A small percentage of the faculty were familiar with Cisco Webex Meet and Go to Webinar platforms.
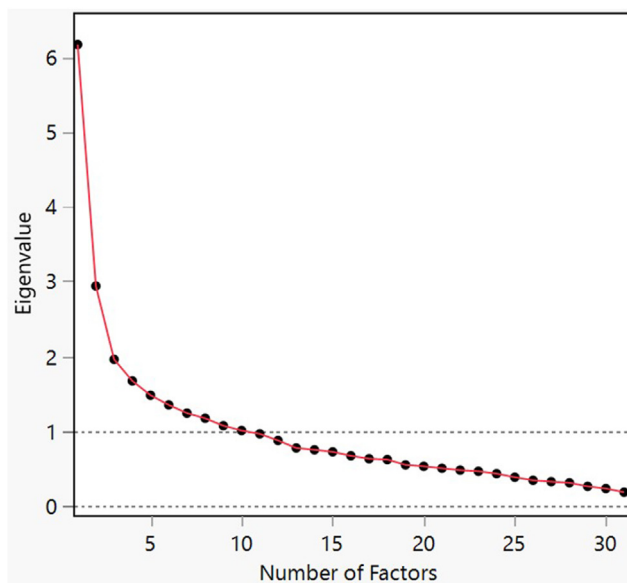

Fig. 1 — Screen Plot.

Table 3 – Exploratory Factor Analysis Factor Loadings Among the participating Faculty members.

Underlying structures	Instructor Student Interaction Factor 1	Faculty and IT related Factor 2	Faculty Training Factor 3	Faculty Preparation Factor 4	Cronbach's alpha
1. The level of my interactions with students in the fully online course is higher than in a traditional face-to-face class.	0.723				0.83
17. I am able to provide better feedback to my fully online students on their performance in the course	0.672				
18. I am more satisfied with teaching fully online as compared to other course delivery methods.	0.650				
9. I look forward to teaching my next fully online course	0.548				
12. My fully online students are more enthusiastic about their learning than their traditional counterparts	0.538				
7. I miss face-to-face contact with students when teaching fully online	0.491				
10. My students are very active in communicating with me regarding fully online course matters	0.478				
2. The flexibility provided by the fully online environment is important to me.	0.470				
16. I am satisfied with the use of communication tools in the fully online environment (e.g., chat rooms, threaded discussions, etc.).	0.437				
3. My fully online students are actively involved in their learning.		0.545			0.74
19. My fully online students are somewhat passive when it comes to contacting the faculty regarding course related matters.		0.528			
14. Fully online teaching is often frustrating because of technical problems.		0.515			
24. Fully online teaching is gratifying because it provides me with an opportunity to reach students who otherwise would not be able to take courses.		0.482			

Table 3 – (continued)

Underlying structures	Instructor Student Interaction Factor 1	Faculty and IT related Factor 2	Faculty Training Factor 3	Faculty Preparation Factor 4	Cronbach's alpha
26. I did not face any challenge in adopting to online teaching150 responses		0.448			
21. The participation level of my students in the class discussions in the fully online setting is lower than in the traditional one		0.446			
25. It is more difficult for me to motivate my students in the fully online environment than in the traditional setting		0.438			
5. The technology I use for fully online teaching is reliable.		0.412			
27. I would have done better if I was given a few training sessions on online teaching before starting online sessions			0.987		0.74
28. Training sessions on the effective use of online platforms for teaching is essential			0.562		
15. It takes me longer to prepare for an online course on a weekly basis than for a face-to-face course				0.656	0.61
6. I have a higher workload when teaching a fully online course as compared to the traditional one				0.616	
Estimated variance explained (%)	11.28%	10.56%	6.27%	5.18%	33.29%

Note: Only items with factor loadings >0.4 are shown.

Table 4 – Factor wise scores for faculty type, age, and years of teaching experience.

	Faculty–Student Interaction	Faculty and IT related	Faculty Preparation	Faculty Training
Technical group	37.14%	37.67%	37.01%	34.31%
Non-technical group	62.86%	62.33%	62.99%	65.69%
Age (in years)				
25–30	16.24%	16.78%	17.63%	17.39%
31–45	57.61%	57.37%	57.85%	56.01%
46–50	13.48%	13.83%	13.31%	14.35%
51–55	3.77%	3.37%	3.31%	3.97%
56–60	7.61%	7.61%	6.70%	7.00%
Above 60	1.28%	1.28%	1.19%	1.28%
Years of teaching experience				
0 to 5	24.74%	25.95%	27.27%	25.79%
6 to 10	24.05%	23.57%	22.41%	23.10%
11 to 15	18.88%	19.21%	18.82%	18.20%
15 and above	32.33%	31.27%	32.91%	32.91%

Fig. 2 — Composite score for each of the factors by faculty type, age and year of experience represented graphically.

Table 5 — Association between independent and dependent variables.

Independent variable	Dependent variable	Chi-Square value	DF	P-value
Faculty Type	Total Composite Score	6.121	1	0.0134
Age		14.25	1	0.0002*
Year of Teaching Experience		16.9	1	<0.0001*
Gender		0.29	1	0.588
No. of sessions conducted since the lockdown		5.73	4	0.22
Previous experience in online teaching and learning (only as a teacher)		4.0	2	0.13

The three open-ended questions attempted to recognise the real-time concerns of the faculty members. Questions such as factors facilitating ERT, factors hindering ERT and suggestions for improvement for which vivid rich responses were received. The most facilitating factors were uninterrupted high-speed stable broadband network (>50 Mbps speed) at home with power back up (18%), convenient, flexible timing, work from home, no travel time, family support leading to more time spent with students (13%), screen sharing, videos and PPTs sharing prior to the session, modifying PPTs to suit online teaching (11%), student interactions, and participation (11%), ease of online platforms, availability of web-based learning resources and use of advance features to teach (8%), previous experience with online teaching and maintaining the continuity of academics (4%)

The factors that hindered the ERT were poor internet connectivity for both faculty members and students (38%), technical glitches; inaudibility, lag in speech and video (21%), lack of training in online platform usage (12%), difficult to know if students have understood and lack of face-to-face interaction (10%), increased preparation time, environmental issues, domestic issues, bad behaviour, and short attention span of the students were some of the other issues that were challenging.

Faculty members had the following suggestions to improve the ERT and student learning experience in future: Provision of laptops, dongles for all students and training to make use of online platforms effectively (86%). Conducting training to faculty members to use online platforms efficiently, create teaching modules suitable for online teaching, make the sessions interactive (28%), provision of hi-speed, fast internet connectivity on the campus and setting up a studio for video recording (21%),better/easier learning platform, customisation of the platform for teaching, graphics and better ICT support for faculty and students (16%), provision for remote access to library resources for both students and faculty (10%), blended learning[7]at least 30% online post ERT (7%).

Discussion

Emergency remote teaching, as described by Hodges 'is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances. It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated.'[7] ERT has proved to be extremely useful during the COVID-19

pandemic to keep the academic delivery uninterrupted. Faculty satisfaction forms one of the five pillars of quality online education and also is associated with outcomes like student learning, student satisfaction, and the programmes' success.[22]

The present study reports the perceptions and challenges faced by faculty members of a private University regarding the ERT during the initial phase of the pandemic. The study also highlights the factors that facilitated and hindered the ERT and suggestions for an improved teaching and learning experience for faculty and students.

Our results indicated that most of the faculty members (Table 5) were satisfied with ERT; the factors that contributed to this were flexibility of class scheduling and better internet connectivity from home. Saini et al too, have reported similar satisfaction among nursing faculty.[23] Alqabbani et al have documented high perceived effectiveness and levels of satisfaction, along with the high level of anxiety that could be attributed to COVID 19 pandemic rather than shifting to ERT.[24] One more aspect that was found to be facilitating the ERT in our study, was working from home, thus saving on travel time, and family support leading to more time spent with students. This is contrary to what has been reported,[25] where family responsibilities were seen as hindering in carrying out ERT.

In our study, satisfaction was significantly associated with age and years of teaching experience, similar to traditional teaching, where age and experience matter, as they develop coping mechanisms leading to less burnout, improved professional and social skills, and better working conditions.[23] Among the four factors identified with factor analysis, factor labelled 'faculty–student interaction' showed the highest correlation with perceived faculty satisfaction. This suggests that in spite of moving to ERT with little time for preparation, the faculty attempted to provide the best possible learning experiences, instructional approaches and resources. Blundell et al reported the Instructor-student Interaction factor as the strongest predictor of faculty satisfaction which was expected to translate into successful student learning.[16] Earlier research too has reported a strong correlation between student learning and faculty satisfaction.[26] The other factor that affected faculty satisfaction was 'faculty and IT related', but to a lesser extent than the instructor-student satisfaction factor. Lack of technical expertise, technical support and unfamiliar online platforms were the IT aspects that contributed to lesser satisfaction, similar to findings from Blundell et al.[16] Most of the faculty members opined that they would have been able to offer better learning experiences for students, if they had received some sort of training for offering online classes similar to the findings reported by Evans et al, and O'Quinn et al,[27,28] which was also evident as the factor loading (factor 4,0.987) and also suggestions given in the open-ended question (86%).

While faculty who used technology routinely in their training (technical group) conveyed an easier transition to ERT for themselves and their students, the rest of the instructors (non-technical group) seemed to be learning online and remote teaching strategies and tools while teaching remotely.[17] Investing in faculty development programmes and IT infrastructure to handle the smooth transition from face-to-face to ERT in case of future emergency disruptions[29] would ensure better quality education in terms of student outcomes and faculty preparedness.

Our data suggest that faculty members who were accustomed to depending on verbal and nonverbal clues from students during face-to-face interactions to gauge student understanding found a lack of cues from students a major challenge. This was very similar to a study carried out across Universities in the United States of America[29]: losing face-to-face interactions, student access to the Internet or technology, time management, or student engagement, and negative student behaviour/attitude. Similar challenges were reported by Whelan, where 'feeling overwhelmed with all the online learning resources and tools', 'lack of quality Internet access', 'lack of knowledge about online/remote teaching strategies' were the top three challenges.[17]

The results are limited to a single University, but the experiences and perceptions gained from such studies would help in arranging faculty development programmes for the introduction of e-learning tools and developing content suitable for online education in future. However, it would be interesting to see if faculty satisfaction has resulted in improved student learning outcomes. Studying the student's perception of challenges faced could have helped in corroborating the student-related faculty perceptions.

Conclusion

The 20 item tool with four factors demonstrated satisfactory psychometric properties similar to Bolliger et al.[15] Extending IT support and training for effective use of digital technology were major suggestions given by the faculty. The study added valuable information for the University to institute a learning management system and a series of training for faculty on the effective use of digital technology to enhance student learning. The study also contributed to a policy decision on adopting blended learning to balance the cognitive and skill requirements of student learning. One set of faculty accepted ERT in its totality as an effective mode of teaching/learning with wider usability in the future, contradicting the other set who preferred face-to-face offline teaching methods. Elaborate opinions and perceptions of the users are explicitly summed up and presented as a part of the next publication.

Disclosure of competing interest

All authors have none to declare.

Acknowledgements

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