

Perceptions of Blended Learning in Undergraduate Medical Education in Bangladesh: Medical Teachers' Views

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Abstract

Background: Medical education exposes students to authentic learning situations and need epistemological access to tacit knowledge, skills and practice in order to interpret patient problems. Adopting a new teaching-learning approach is daunting task. Blended learning offers opportunities for the complexity of learning by integrating face-to-face and online interaction. However, this growing demand for blended learning possesses problems and challenges that are noteworthy to investigate, specifically in medical education. **Method:** This descriptive type of cross-sectional study was conducted to reflect different lenses of experiences by the medical teachers on views of blended learning in undergraduate medical education in Bangladesh. Data collected from eight medical colleges of Bangladesh. Convenient sampling technique adopted for selection of medical college and the respondents were selected from the medical college purposively. Self-administered semi-structured questionnaire was administered to collect data from 70 medical teachers to gain more details insight related with this research issue. **Results:** This study revealed out that most teachers owned digital equipments, from smartphones (100%) to laptops (91.4% of teachers), had optimum knowledge and skill in ICT (88.6% of teachers), were using social networking (91.4% of teachers). All (100%) respondents stated that they did not have established e-library facilities and no established Information Technology (IT) laboratory facilities as opined by 43% of teachers in their medical colleges. The data analysis ascertained that the teachers were in affirmative consensus on the components of teaching learning process. By mean scores of 5-point likert scale, satisfying prominent components were listed as organizing teaching process by the teachers (4.3 for teachers) and well design curriculum (4.3 for teachers). In this study, maximum 55.1% of teachers respondents preferred 20-40% of overall online class. **Conclusion:** The study recommended that a proper framework that integrate policies, curriculum contents alone with technological and electronic innovation matching with blended learning format to stimulate teaching and learning process in the path for successful introduction of blended learning in undergraduate medical education in Bangladesh.

Key Word: Blended learning, Online learning, ICT medical education, Curriculum updating.

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Introduction

With the advancement of Information and Communication Technologies (ICTs) in the 21st century and widespread integration of those technologies into the learning communities, blended learning also known as hybrid learning or mixed-mode instruction, has become a popular teaching and learning strategies in the world of education today.

Quality of medical education is facing challenges nowadays. The upward curve of growing medical knowledge, changes in health care delivery and changes in the learning interests of students in health and medical sciences. In this perspective, traditional methods of medical education can no longer meet the needs, support the students

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to achieve and maintain the notion of active and unremitting learning¹.

To improve the quality of education, many academic medical institutions are progressively investing in the application of virtual/e-learning and to support novel teaching and learning approaches and strategies to help today's learners to be successful. Meanwhile, pure virtual education is not suggested in medical sciences, because it is increasingly emphasized that the virtual learning cannot replace the traditional face-to-face learning rather merely complementary to it. For that reason, currently, one of the main approaches towards e-learning is the blended (hybrid) learning in which virtual education is combined with the traditional classroom-based education.

Medical universities have blended face-to-face teaching with online instruction when evolving new educational processes especially during COVID 19 period. As a result, the University Grants Commission (UGC) of Bangladesh has encouraged the adoption of blended learning in universities as one goal to enhance and support the country's e-learning project and ensure the rapid growth of undergraduate students despite the limited capacity of medical colleges that suit Bangladeshi culture. The study was designed to the views on blended learning among medical teachers with practical benefits and challenges that might affect blended learning implementation in under graduate medical education running in Bangladesh.

Method

This study was a descriptive type of cross-sectional study to find out the views regarding the various components of blended learning modes in undergraduate medical education among teachers. This study was conducted from 1st January 2022 to 31 December 2022 at eight undergraduate government and non-government medical college located in Dhaka and outside Dhaka. The target population for this study was teachers of all levels of basic science, para clinical and clinical subjects of eight different medical colleges who had 24

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attended online classes or currently practicing blended learning. This study employed the 'convenience sampling' technique for selection medical colleges. Respondent for quantitative data collection were selected purposively based on their availability, interest and have valuable information, gained sufficient experience on this topic at the time of our study. As non-probability sampling technique applied to collect data, sample size was not calculated by using statistical formula rather by assumption. Total sample size was about 70. Self-administered semi-structured questionnaire consisted of Likert-scale, and open-ended questions were developed to collect data from the teachers and students. The data was analyzed using SPSS version 19. For a five-point Likert scale data, results for the mean (M) above 03 will be considered as satisfactory. The response given as 'strongly agree' or 'agree' were also considered as positive towards the statement. Some of the quantitative data for developing figures were completed using the Excel programme. Descriptive analysis was performed for quantitative data by mean, standard deviations, frequencies and percentages as applicable. Quantitative data were presented by tables and graphs with necessary descriptions.

Results

'snapshot' of medical teachers' perspectives on current perception about blended learning were depicted in the under section.

Of the total respondents (n=70), 43 (61%) were male and distribution of total as per their designation is shown in figure 1.

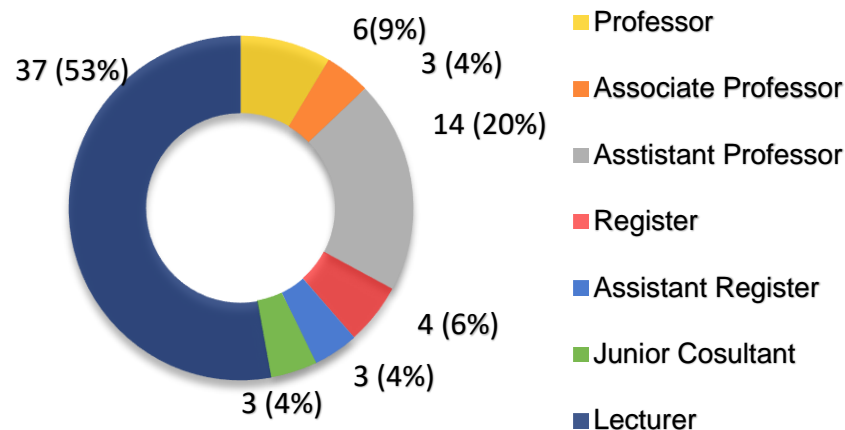


Figure 1: Distribution of the medical teachers by their d

Table 1: Distribution of medical teachers regarding general view about the using of personal devices for online browsing (n=70)

Personal devices for online browsing	Frequency*	Percent (%)*
Using Desktop	9	12.9
Using Laptop	64	91.4
Using Smart Phone	70	100.0
Using iPod/tablets	34	48.6

* **Multiple response**

Table 1 shows that 100% of the responded were using smartphone. Followed by 91.4%

and 48.6% respondents were using laptop and iPod / tablets respectively.

Table 2: Distribution of medical teachers regarding general view by them about availability of IT facilities related to blended learning (n=70)

Statement about available IT facilities	Frequency (%)	
	Yes*	No*
Wi-Fi/mobile data base facility available in college	70 (100)	0 (0)
Wi-Fi/ mobile data base facility available in home	70 (100)	0 (0)
Established e-library facilities available in college	0 (0)	70 (100)
Established IT lab facility available in college	30 (42.9)	40 (57.1)

* **Multiple response**

Table 2 shows that 100% of the teachers responded that have their Wi-Fi/ mobile database facility available in their college and home. About 43% teacher responded that

there were no established IT lab facilities medical college.

Table 3: Distribution of medical teachers regarding general views by them about technological skill to join with blended learning (n=70)

Statements in relation to technological skill to join with blended learning	Frequency (%) of level of agreement					Mean (±SD)
	SDA=1	DA=2	NAND=3	A=4	SA=5	
Adequate knowledge and skill in ICT	0 (0)	1 (1.4)	3 (4.3)	62 (88.6)	4 (5.7)	3.98 (0.399)
Can easily connected to internet facility in own PC/laptop/smartphone	0 (0)	0 (0)	0 (0)	45 (64.3)	25 (35.7)	4.44 (0.499)
Easily access to educational website of Med college/home	5 (7.1)	0 (0)	13 (18.6)	40 (57.1)	12 (17.1)	3.77 (0.981)
Can interacting with the student by using email/social medias	0 (0)	0 (0)	1 (1.4)	49 (70.0)	20 (28.6)	4.27 (0.479)
Can interacting with the peers/colleges by using email/social medias	0 (0)	0 (0)	9 (12.9)	46 (65.7)	15 (21.4)	4.09 (0.583)

Legend: SDA= Strongly disagree, DA= Disagree, NAND= Neither agree nor disagree, A= Agree, SA= Strongly agree

Table 3 depicted that out of 5-point Likert scale mean scores regarding different statements in relation to technological skill to join with blended learning were 3.8 to 4.5. Considering their level of agreements as ‘strongly agreed’ or ‘agreed’, 94.3% and 100% of the teachers were positive about the statements that ‘Adequate knowledge and skill in information & communication technology (ICT)’ and ‘Can easily connect to

internet facility with their own PC/laptop/smartphone’. Similarly, the positive statements of the teachers were 74.2%, 98.6% and 87.1% for the statements that ‘Easy access to educational website both in medical college and home’, ‘Can interact with students by using email/social medias’ and ‘Can interact with their peers/colleagues by using e-mail or social medias’ respectively.

Table 4: Distribution of medical teachers regarding general views by them about the categories of instructional technology (n=70)

Statements in relation to the categories of instructional technology	Frequency(%) of level of agreement				
	Not aware at all	Not planning to use	Interested to use	Planning to use	Currently using
Social networking (Twitter, Facebook)	1 (1.4)	1 (1.4)	4 (5.7)	0 (0)	64 (91.4)
Content management (Wikipedia, blogs)	1 (1.4)	2 (2.9)	50 (71.4)	14 (20.0)	3 (4.3)
Communication (Chat, web, video conferencing)	1 (1.4)	0 (0)	13 (18.6)	17 (24.3)	39 (55.7)
Student response (i-clicker, turning technology)	19 (27.1)	1 (1.4)	40 (57.1)	8 (11.4)	2 (2.9)

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Plagiarism detection software (turnitin.com, web Assigned)	26 (37.1)	1 (1.4)	33 (47.1)	7 (10.0)	3 (4.3)
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Table 4 shows that out of 70 respondents, 91.4% respondents presently using social networking like Facebook, Twitter etc. Among the respondents, only 4.3% respondents using various content management software. About 55% and 2.9%

of the respondents currently using various communication software and modern applications software for observing student response activities respectively. Only 4.3% of the respondents currently using Plagiarism detection software

Table 5.A: Distribution of medical teachers regarding general views by them on perception status about role of teachers on blended learning (n=70)

Statement of perception status on blended learning (BL)	Frequency(%) of level of agreement						Mean (SD ±)
	SDA=1	DA=2	NAND=3	A=4	SA=5	N/A=0	
Role of teacher in BL is negligible	42 (60.0)	13 (18.6)	7 (10.0)	8 (11.4)	0 (0)	0 (0)	1.7 (1.04)
Teacher organizes the teaching process is important in arousing student interest	4 (5.7)	1 (1.4)	0 (0)	27 (38.7)	38 (54.3)	0 (0)	4.3 (1.00)
Teachers should share teaching materials on online and offline media with students	0 (0)	0 (0)	0 (0)	51 (72.9)	19 (27.1)	0 (0)	4.2 (0.44)
Scope of interaction among student-teacher during class and beyond class hours	0 (0)	0 (0)	1 (1.4)	48 (68.6)	21 (30.0)	0 (0)	4.2 (0.48)

Legend: SDA= Strongly disagree, DA= Disagree, NAND= Neither agree nor disagree, A= Agree, SA= Strongly agree N/A= Not applicable

Table 5.A depicted that out of 5-point likert scale mean scores regarding statements in relation to perception status about role of teachers were 1.7 to 4.3. Considering their level of agreements as ‘strongly agreed’ or ‘agreed’, 11.4% and 93% teachers were positive about the statement that ‘Role of teacher in blended learning is negligible’ and ‘Organizing the teaching process by the

teachers was important in arousing student interest’ respectively. Similarly the positive statement of the teachers were 100% and 98.6% for the statements that ‘teachers should share teaching materials on online and offline media with students’ and ‘Scope of interaction among student-teacher during class and beyond class hours’ respectively.

Table 5.B: Distribution of medical teachers regarding general views by them on perception status about role of students on blended learning (n=70)

Statement of perception status on blended learning(BL)	Frequency(%) of level of agreement						Mean (SD ±)
	SDA=1	DA=2	NAND=3	A=4	SA=5	N/A=0	
Student should have own responsibility in BL	0 (0)	11 (15.7)	10 (14.3)	23 (32.7)	26 (37.1)	0 (0)	3.9 (1.07)
Fulfilling the tasks in BL has greater impact upon student level of learning	0 (0)	8 (11.4)	6 (8.6)	42 (60)	14 (20)	0 (0)	3.8 (0.86)
Scope of student-students interaction amongst themselves about course contents	0 (0)	0 (0)	0 (0)	53 (75.7)	17 (24.3)	0 (0)	4.2 (0.43)
Immediate feedback is preferred from student by using e-mail/ messenger/ messages	2 (2.9)	0 (0)	7 (10.0)	47 (67.1)	14 (20.0)	0 (0)	4.0 (0.75)

*SDA= Strongly disagree, DA= Disagree, NAND= Neither agree nor disagree, A= Agree, SA= Strongly agree N/A= Not applicable

In regards to perception status about role of students in blended learning, table 5.B depicted that out of 5-point likert scale mean scores were 3.8 to 4.2. Considering their level of agreements as ‘strongly agreed’ or ‘agreed’, 69.8% of the teachers had positive statement on ‘Student should have own responsibility in blended learning’. The

teachers stated positively as 80% with the ‘Fulfilling the tusks has greater impact upon student learning’, 100% with the ‘Scope of the student-student interactions among themselves about course content’ and 87.1% with the ‘Immediate feedback was preferred from a student by using e-mail/messenger/ messages’.

Table 5.C: Distribution of medical teachers regarding general views by them on perception status about design of activities and course materials of blended learning (n=70)

Statement of perception status on blended learning(BL)	Frequency(%) of level of agreement						Mean (SD ±)
	SDA=1	DA=2	NAND=3	A=4	SA=5	N/A=0	
Face to Face lessons in BL have a key role in learning	0 (0)	8 (11.4)	4 (5.7)	42 (60)	16 (22.9)	0 (0)	3.9 (0.86)
Student may succeed equally if the lessons are in the form of online learning	13 (18.6)	43 (61.4)	4 (5.7)	9 (12.9)	1 (1.4)	0 (0)	2.1 (0.93)
Online materials should arouse students’ interest	1 (1.4)	5 (7.1)	5 (7.1)	58 (82.9)	1 (1.4)	0 (0)	3.7 (0.66)
Features of BL materials (readability, legibility etc.) are influential on learning	1 (1.4)	2 (2.9)	1 (1.4)	53 (75.7)	14 (20.0)	0 (0)	4.1 (0.56)
BL should have well organized learning	0 (0)	0 (0)	3 (4.3)	51 (72.9)	16 (22.9)	0 (0)	4.2 (0.49)

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management system within the institute

BL should have well organized learning management system within central (university) level	0 (0)	0 (0)	3 (4.3)	50 (71.4)	17 (24.3)	0 (0)	4.2 (0.50)
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A well design curriculum needed for implementing the BL	0 (0)	1 (1.4)	1 (1.4)	47 (67.1)	21 (30.0)	0 (0)	4.3 (0.56)
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*SDA= Strongly disagree, DA= Disagree, NAND= Neither agree nor disagree, A= Agree, SA= Strongly agree N/A= Not applicable

Table 5.C depicted that out of 5-point likert scale mean scores regarding statements in relation to perception status about design of activities and course materials of blended learning were 2.1 to 4.3. Considering their level of agreements as ‘strongly agreed’ or ‘agreed’, 82.9% teachers stated positively with the statement that ‘Face-to-face lessons plays a key role of learning in blended learning, 84.3% with ‘Online material should arouse students interest’, 95.7% with

‘Features of blended learning materials (reliability, legibility etc.) are influential on learning’. Similarly positive statements of the teachers were 95.8% and 95.7% for the statements that ‘Blended learning should have well-organized learning management system within the institute and with the central (university) level respectively. About 97.1% of the teachers stated positively with the statement that ‘A well-designed curriculum needed for implementing blended learning’.

Table 5.D: Distribution of medical teachers regarding general views by them on perception status about assessment activities of blended learning (n=70)

Statement of perception status on blended learning(BL)	Frequency(%) of level of agreement						Mean (SD ±)
	SDA=1	DA=2	NAND=3	A=4	SA=5	N/A=0	
Online formative assessment preferred to know students’ progress	0 (0)	3 (4.3)	17 (24.3)	42 (60.0)	8 (11.4)	0 (0)	3.8 (0.70)
Online summative assessment preferred for certifying the students	4 (5.7)	0 (0)	11 (15.7)	53 (75.7)	2 (2.9)	0 (0)	3.7 (0.79)
Different activities (online announcement of scores, giving group assignments and some rewards) to increase students motivation towards lessons	0 (0)	0 (0)	1 (1.4)	54 (77.1)	15 (21.4)	0 (0)	4.2 (0.44)

*SDA= Strongly disagree, DA= Disagree, NAND= Neither agree nor disagree, A= Agree, SA= Strongly agree N/A= Not applicable

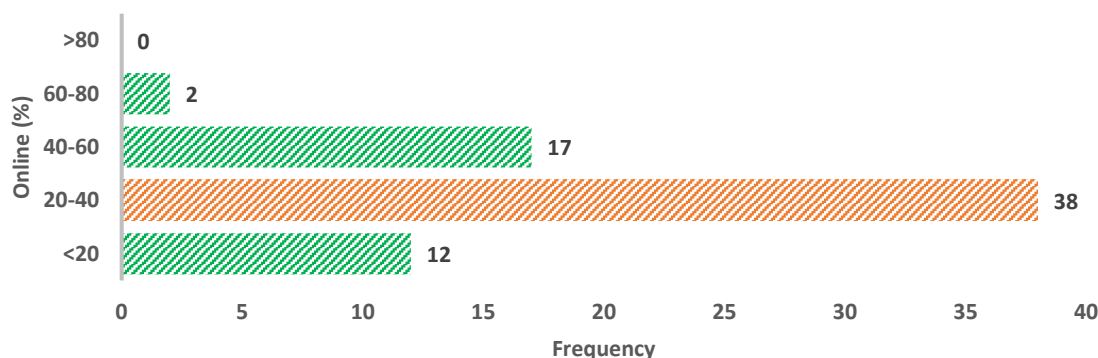
Table 5.D depicted that out of 5-point Likert scale mean scores regarding different statements in relation to perception status about assessment activities of blended learning were 1.7 to 4.3. Considering their level of agreements as ‘strongly agreed’ or

‘agreed’ 71.4%, 78.6% and 98.6% of the teachers were positive about the statements that ‘Online formative assessment preferred to know student progress’, ‘Online summative assessment preferred for certifying the student and ‘Different activities

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(online announcement of scores, giving group assignments and some rewards) to increase student motivation towards lessons’.



* Mean of 35.7 ± 13.04 (%) for 20-40% of online class

Figure 2: **Distribution of medical teacher in relation to their opinion about the preferred mode (online) of teaching-learning session in blended learning**

The teaching-learning session in blended learning, figure 2 illustrated that with a mean of 35.7 ± 13.04 (percentage), total 38 (55.1%)

teacher respondents preferred 20-40% of overall online class. Only 2 (2.8%) teachers preferred mode was $\geq 60\%$ online.

Discussion

In learner-centred paradigm, technology enhanced interactive blended learning allows learning to be individualized, enhances collaborative teaching-learning and realigns the educator's role from disseminator to facilitator of the learning process². (McCoy et al. 2015). Blended learning provides a learning delivery approach that alludes to the adult learning theoretical framework, which relates to practical application of new learning to experiences and fosters life-long learning³ (Lewis 2017). This study aimed to explore medical teachers viewed about blended learning on their learning process.

In this study among the teachers, 43 (61%) were male and 27 (39%) were female. The study showcased that out of 70 medical teachers, maximum 53% were lecturers and minimum 4% were junior consultants. These findings incorporated opinions of teachers from various level and with different teaching experiences.

Among the teacher respondents, 100% of them were using smartphone followed for 91.4% teachers were using laptop and 48.6%

using iPod/tablets. This study revealed that use of smartphone, tablet/iPod, computer and laptop were increased many fold as because of updated educational software, user friendly, availability of databased internet connection and widely used of those machines during on-line virtual education in the time of the COVID pandemic crisis.

Regarding information technology (IT) facilities to join with the blended learning, this study depicted that among all the respondents had their Wi-Fi/ mobile database facility available at their home. All (100%) of them stated that they did not have established e-library facilities in their medical college. About 43% teachers responded that there were no established IT lab facilities in their medical college. To ensure online and bended learning we must have to establish e-libraries with Wi-Fi connections and uninterrupted power supply at every medical institutes and at homes of the students and teachers.

On regards to technological skill on ICTs to join with the blended learning, mean scores were 3.8 to 4.5 for teachers as on 5 point likert

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scale. In regards to instructional technology on ICT for facilitating the blended learning, 91.4% teachers presently using social networking like Facebook, Twitter etc. About 3% of teachers respondents currently using the modern applications software for observing student response activities. On respect to the impact on student engagement with IT facilities, it was found that teaching with technology directly has an impact on student achievement and increase knowledge on digital literacy influenced student careers by using various web tools increased collaboration, communication, and creativity⁴ (Shorbaji et al. 2015). This study revealed that ICT facilities, ICT related technological skill and ICT related instructional technology for facilitating the blended learning needed to boost up further to enrich digital literacy. This study also revealed that although most teachers owned digital equipments, from smartphones to laptops, had internet access and basic software knowledge, and majority of the teachers claimed that the incorporation of ICT into their medical education was too inadequate to offer skills for their future profession. Hence, introducing ICT-related introductory training sessions prior to utilizing blended learning approaches and ensuring a sense of community (interactive online sessions) in their medical teaching is integral to the diversification of skills in addition to an integrated teaching method.

In a study by Poon viewed that blended learning enables students to become more motivated and more involved in the learning process, therefore enhancing their commitment and perseverance. Student satisfaction had also been reported to be higher in blended learning courses compared with purely face-to-face courses⁵. In this study about current perceptions on blended learning, teachers' perceptions were measured in terms of 18 items covering the components of role of teachers/lecturers, role of students, features of course materials, assessment & design of activities in blended learning. Considering their level of

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agreements as 'strongly agreed' or 'agreed' as positive statements of data, it is noticeable that teachers stated positively with the statement that 'teacher organizes the teaching process is important in arousing student interest' and 'a well design curriculum needed for implementing the blended learning' by 93% and 97.1% respectively. Again, teachers strongly disagreed (60%) with the perception of the role of teacher of teachers in blended learning is negligible. Furthermore, teachers were satisfied with online course materials, online sharing, student- student & student-teacher interaction, and assessment and design of activities. Increase knowledge on technology and attitude towards using of those technology for conducting class rather than a traditional class can drive both teachers and students more satisfaction. Moreover e-learning in undergraduate medical teaching in Bangladesh is practicing from COVID era may elicit different types of experiences. A study by Cirak depicted that the prominent components in the teaching-learning process have been identified as face-to-face lessons, the features of online course materials, design-specific activities, process-based measurement and evaluation, student-student interaction and out-of-class sharing respectively⁶.

Regarding the opinions on teaching-learning sessions in blended learning, a study by Shorbaji et al., indicates that network-based e-learning is equivalent to and perhaps even more effective than traditional learning in terms of knowledge, skills gained and has great potential in supporting capacity-building and competency-development in the health-care workforce globally⁴. However, in this study 55.1% teachers with a mean score of 35.7 ± 13.04 (percentage) preferred 20-40% of overall online class while blending with online and offline class. This study revealed that maximum 42% teachers responded for 60-80% and 40-60% online mode of delivering lectures respectively as they are already oriented with online platform by using popular software application. On the

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other hand, for clinical skills, better problem-solving, critical thinking and decision-making skills respondent still rely on offline mode of teaching-learning process. These differences among the teachers were probably due difference in experience in the online classes during the COVID 19 pandemic. Online teaching-learning platform is relatively new in Bangladesh and it require adequate digital literacy while joining as stated in finding of this study above. This finding was supported by a study in Bangladesh with the statement that the effectiveness of classroom activities was questionable through online platforms⁷. (Aziz et al. 2020).

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Conclusion

Information and communication developments have changed the way of teaching-learning systems. This study grabbed that teachers are using smartphone, iPod/tablet and laptop and different social media for teaching-learning process. Teachers highlighted the absence of e-library, absence or not fully equipped IT lab, absence of Wi-Fi facility in medical college campus, lack of motivation of the authority to implement user-friendly ICT facilities for implementing blended learning in medical college. Hence, introducing ICT at the initial stage of the undergraduate program and redesigning the curriculum to encourage the usage of ICT in their medical studies is integral to the diversification of skills of Teachers/students in addition to an integrated medical teaching method.

Results obtained from the study have shown that teachers demonstrate positive perceptions towards blended learning. In relation to the prominent components of the blended

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learning process, this study pointed out that teachers has positive concerned with the role of the instructor and role of student in the blended learning process. Then, the prominent components have been identified as face-to-face lessons, the features of online course materials, design-specific activities, student-student interaction, and assessment in blended learning respectively. Therefore, with the help of technology, blended learning can be used as an alternative approach in teaching and learning in medical education.

References

1. Burn J, Thongprasert N, (2005). A culture-based model for strategic implementation of virtual education delivery, *Int J Educ Dev ICT*, 1:1, 32–52.
2. McCoy L, Pettit RK, Lewis JH, Bennett T, Carrasco N, Brysacz S, (2015). Developing technology-enhanced active learning for medical education: challenges, solutions, and future directions. *J Am Osteopath Assoc*, 115:4, 202–11.
3. Lewis SK, Thompson P, (2017). Application of adult learning theory to physician assistant education. *J Physician Assist Educ*, 28:4,196–200.
4. Shorbaji NA, Atun R, Car J, Majeed A, Whelei E, (2015). E-Learning for undergraduate health professional education: a systematic review informing a radical transformation of health workforce development, Switzerland, WHO Library Cataloguing-in-Publication Data, 49-50.
5. Poon J, (2013). Blended learning: An institutional approach for enhancing students' learning experiences, *Journal of Online Learning and Teaching*, 9:2, 271-287.
6. Çırak K, Yıldırım, (2018). The Students' perceptions on blended learning: A-Q method analysis, *Educational Sciences: Theory & Practice*, 8:2, 427–446.
7. Aziz SM, Roobahani N, Khatony A, (2020). Factors affecting the acceptance of blended learning in medical education: application of UTAUT2 model. *BMC Medical Education*, 20:367, 1-9.