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Mansoura Manchester Medical Program Students' Satisfaction of Blended Learning Approach: A Comparative Study

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Abstract: **After the end of the 1st wave of Covid-19 pandemic, Egypt decided that the new academic year (2020-2021) will be conducted via blended learning approach, the didactic lectures will be held online, and the small number activities will be face-to-face in the campus. This study aimed to evaluate and reflect on the satisfaction of students with the used blended learning approach in order to detect weakness and points to improve. A cross-sectional study was conducted on undergraduate medical students at Mansoura Manchester Medical Program. The sample was chosen in respect to clinical, preclinical years, male and females. A questionnaire was designed formed of closed & open-ended questions. The results were subjected to SPSS program for Windows and the results were considered significant when $p \leq 0.05$. The younger students were more satisfied with blended learning and the results differences were mostly statically significant. The only two exceptions in which older students recognized model more organized & reported less problem during the beginning of E-learning. Also, female students were more positively perceiving blended learning in all items of the questionnaire. Most of students asked for better time management, better technological system support and increasing time for clinical /practical rounds. They suggested also more staff training for E-learning and stated that internet connection is a major challenge for E-learning. Younger students and females are more in favour for the blended approach. Working on the multiple challenges as infrastructure and staff training is a must.**

Keywords: **MMMP, blended approach, challenges.**

I. INTRODUCTION

In December 2019, the first case of coronavirus disease 2019 (COVID-19) from city of Wuhan in the people republic of China was reported to the World Health Organization (WHO) [1]. At that time, no one could predict that this new virus would become a deadly pandemic, causing a total shut down of all daily activities and require social distancing [2]. On the 30th of January 2020, the WHO declared COVID-19 to be a Public Health Emergency of International Concern and on the 11th of March 2020, it was announced as a state of pandemic [3]. After the end of the 1st wave, Egypt decided that the new academic year (2020-2021) activities will be blended in the form of digital learning environment especially in the crowded large number lectures and face-to-face in the small number activities as PBL, clinical and/or practical sessions but with full respect to the preventive measures and social distances.

Blended learning could be defined as a combination of both traditional face-to-face learning and either synchronous or asynchronous E-learning [4]. E-learning also known as online education characterised by the usage of electronic resources like internet, computers, and smartphones to obtain and spread knowledge. When it is augmented by audio visual elements, E-learning could offer educational content and numerous tests supporting these contents, that can enable access to needed information, and could provide an interactive environment for students and the faculty [5].

Online learning is considered a practicable and flexible method for training, scientific meetings conduction and a sustainable learning method. The expansion in global virtual learning is dependent on the feasibility of technology-enhanced active learning tools. Now, usage of digital technology in medical education is needed to have a crucial part of the learning incomes [6].

It has been argued as it does not only augment the understanding of the subject, but it also helps students to deal with the real-life scenario in a more practical mode [7]. The pandemic of COVID-19 forced us to use virtual classrooms to foster creative thinking and problem solving skills of the students. The existing digital platform empowered communication with learners with lower barriers and the online teaching was found to be a method that challenged the commonly used traditional approach [8].

However, E-learning has some disadvantages, including high-cost multimedia materials, high costs for platform maintenance, and both faculty and students training is a must. On the other hand, traditional learning presents several limitations, including requiring the physical presence of students and teachers at a specific time and place [9].

Mansoura Manchester Medical program (MMMP), Mansoura Faculty of Medicine, Egypt is applying Hybrid PBL curriculum that is five years duration. It used Moodle as a learning management system and Microsoft teams as the primary tools for virtual teaching. In cases of interruption, Zoom Cloud meetings platform was used as an alternative tool. In addition, social media groups used for announcements and extra communication. During the E-learning process, any obstacle faced, the students or staff, could contact the technical staff using the emails, WhatsApp or mobile calls in cases of emergency. Preparation for the blended learning activities at MMMP required a lot of administrative meetings and arrangements which were conducted before the start of the academic year on regular and adequate basis. Didactic lectures were recorded ahead and there were online discussion sessions conducted to allow students to ask and interact directly with professors. PBL and practical/ clinical rounds were held face to face. Thus, this study aims to evaluate and reflect on both virtual and face to face conducted activities in order to detect weaknesses and points to improve in the adopted blended learning tools.

II. MATERIAL AND METHODS

2.1. Study design and participants

This is a cross-sectional study that was conducted on undergraduate medical students at MMMP. It has been decided to choose semester three students as a representative for the preclinical phase and semester nine students as a representative for the clinical phase. Ethical approval was obtained from IRB at Mansoura Faculty of Medicine and the confidentiality of the information obtained were maintained.

2.2. The questionnaire

Questionnaire was created after extensive literature review, administered online to the assigned students. It is composed of 14 closed ended questions graded with 5 points Likert scale (Table I); and two open ended questions: Q1: Do you have any suggestion to be considered in future application of the blended learning system? Q2: What are the challenges you think we have to overcome in future during application of blended learning system?

2.3. Statistical analysis

Data were analyzed using the Statistical Package of Social Science (SPSS) program for Windows (Standard version 21). The normality of data was first tested with one-sample Kolmogorov-Smirnov test. Qualitative data were described using number and percent. Association between categorical variables was tested using Chi-square test. Continuous variables were presented as mean ± SD (standard deviation) and two groups were compared with Student *t* test. Level of significance: For all above mentioned statistical tests done, the threshold of significance is fixed at 5% level. The results were considered significant when $p \leq 0.05$. The smaller the p-value obtained, the more significant are the results.

III. RESULTS

Table (1): Sociodemographic distribution of Manchester program students, Egypt from preclinical and clinical grades involved in the study (n= 609).

	Preclinical Semester (3) (n=330)	Clinical Semester (9) (n=279)	Test of significance	P value
Gender				
Male	152 (46.1%)	132 (47.3%)	χ^2=0.095	0.758
Female	178 (53.9%)	147 (52.7%)		
Nationality				
Egyptian	153 (46.4%)	157 (56.3%)	χ^2=5.94	0.015*
Others	177 (53.6%)	122 (43.7%)		
Other nationality				
Bahraini	48 (14.5%)	32 (11.5%)		
British	1 (0.3%)	1 (0.4%)		
Iraqi	1 (0.3%)	1 (0.4%)		
Jordanian	12 (3.6%)	0 (0%)		
Saudi Arabian	28 (8.5%)	0 (0%)		
Lebanese	1 (0.3%)	0 (0%)		
Libyan	1 (0.3%)	0 (0%)	-	-
Malaysian	59 (17.9%)	73 (26.2%)		
Burmese	1 (0.3%)	0 (0%)		
Palestinian	1 (0.3%)	1 (0.4%)		
Syrian	15 (4.5%)	10 (3.6%)		
Yemeni	6 (1.8%)	2 (0.7%)		
Kuwaiti	0 (0%)	2 (0.7%)		

χ^2 : Chi square test

Table (2): Associations of responses to questionnaire items between preclinical students (n=330) and Clinical students (n=279).

Question item	Preclinical Semester (3) (n=330)	Clinical Semester (9) (n=279)	P value
1.	3.20±0.97	2.89±1.02	≤0.001*
2.	3.69±0.86	3.43±1.12	0.001*
3.	4.03±0.83	3.37±0.96	≤0.001*
4.	3.80±0.83	3.17±1.01	≤0.001*
5.	3.34±1.07	↑4.10±0.99	≤0.001*
6.	3.39±0.83	3.25±0.98	0.07
7.	3.41±0.95	2.88±0.98	≤0.001*
8.	3.74±1.08	2.63±1.19	≤0.001*
9.	3.27±1.04	2.75±1.21	≤0.001*
10.	3.17±0.94	2.48±1.09	≤0.001*
11.	3.22±0.96	2.79±0.97	≤0.001*
12.	3.47±0.85	3.03±0.99	≤0.001*
13.	2.84±1.23	2.41±1.13	≤0.001*
14.	3.23±0.93	2.92±0.95	≤0.001*
Total	47.82±7.67	42.11±8.62	≤0.001*

Question item 1-14: questionnaire items "Table I"

It has been shown that the younger students (semester 3) were more satisfied regarding blended learning and the resulting differences were statically significant in all item questions except number 6. The only two exceptions in which older students recognized model more organized and reported fewer problems during the beginning of E-learning.

Table (3): Associations of responses to questionnaire items between preclinical students (n=330) and Clinical students (n=279) according to gender.

Question item	Semester (3) preclinical (n=330)			Semester (9) Clinical (n=279)		
	Male	Female	P value	Male	Female	P value
1	3.13±1.0	3.26±0.94	0.238	2.75±1.08	↑3.01±0.96	0.037*
2	3.63±0.85	3.75±0.87	0.227	3.41±1.09	3.45±1.15	0.810
3	3.99±0.83	4.07±0.83	0.389	3.21±1.04	↑3.51±0.87	0.01*
4	3.73±0.82	3.86±0.84	0.161	3.05±1.01	3.28±1.01	0.054
5	3.27±1.11	3.40±1.02	0.277	4.05±0.97	4.15±1.01	0.418
6	3.32±0.84	3.44±0.82	0.187	3.22±0.95	3.28±1.01	0.577
7	3.33±0.96	3.48±0.92	0.141	2.88±0.98	2.88±0.98	0.992
8	3.72±1.14	3.75±1.02	0.807	2.61±1.21	2.65±1.19	0.821
9	3.18±1.05	3.35±1.02	0.153	2.78±1.19	2.73±1.23	0.719
10	3.13±1.00	3.21±0.89	0.464	2.48±1.13	2.48±1.07	0.989
11	3.15±0.96	3.28±0.94	0.180	2.70±0.96	2.87±0.97	0.154
12	3.35±0.91	↑3.57±0.78	0.017*	2.92±1.02	3.12±0.97	0.098
13	2.81±1.27	2.87±1.19	0.650	2.43±1.13	2.37±1.13	0.630
14	3.13±1.0	3.31±0.85	0.074	2.85±0.92	2.97±0.97	0.308
Total	46.89±7.83	48.62±7.46	0.04*	41.38±8.9	42.76±8.33	0.184

Question item 1-14: questionnaire items "Table I"

It has been shown that the female students (semester 3) were more satisfied with blended learning in all items of the questionnaire. Also, the female students of semester 9 were more positively satisfied with blended learning in all items of the questionnaire except questions 9 and 13 which concerning adequacy of clinical training which revealed that females were less satisfied with the time and adequacy of the clinical round in relation to male students.

Table (4): Associations of responses to questionnaire items between preclinical students (n=330) and Clinical students (n=279) according to nationality.

Question item	Semester (3) preclinical (n=330)			Semester (9) Clinical (n=279)		
	Egyptian	Others	P value	Egyptian	Others	P value
1	3.17±0.91	3.23±1.02	0.602	2.68±0.97	3.15±1.04	↑≤0.001*
2	3.83±0.79	3.57±0.91	0.005*	3.32±1.13	3.57±1.09	0.314
3	4.04±0.84	4.03±0.82	0.850	3.39±0.97	3.34±0.95	0.614
4	3.84±0.79	3.76±0.86	0.383	3.15±1.02	3.19±1.00	0.682
5	3.18±1.13	3.48±0.98	↑0.01*	4.10±1.03	4.10±0.93	0.969
6	3.30±0.77	3.46±0.87	0.077	3.29±0.99	3.20±0.98	0.459
7	3.50±0.96	3.33±0.93	0.105	2.71±1.01	3.09±0.89	0.001*
8	3.79±1.11	3.69±1.05	0.422	2.28±1.17	3.08±1.07	↑≤0.001*
9	3.17±1.12	3.36±0.95	0.095	2.67±1.23	2.86±1.17	0.190
10	3.02±0.98	3.29±0.88	↑0.008*	2.32±1.10	2.69±1.06	↑0.006*
11	3.14±1.04	3.29±0.87	0.172	2.66±1.01	2.96±0.88	↑0.011*
12	3.41±0.87	3.52±0.83	0.253	2.90±1.09	3.19±0.84	↑0.018*
13	2.71±1.35	2.95±1.10	0.074	2.29±1.14	2.56±1.09	↑0.046*
14	3.23±0.96	3.23±0.89	0.978	2.89±0.94	2.94±0.97	0.700
Total	47.37±7.53	48.22±7.79	0.314	40.69±8.58	43.94±8.34	0.002*

Question item 1-14: questionnaire items "Table I"

By analysing the students' response to questionnaire items in relation to their nationalities, a significant difference was found between Egyptian students from their peers from other nationalities in the clinical phase (p=0.002) especially in item questions 7-8, 10-13; While, for students in the preclinical phase, significant differences in response were recorded in item questions 5,10.

Table (5): number and percentages of respondent and non-respondent students in both preclinical and clinical phases

	Q1		Q2	
Students	Preclinical	Clinical	Preclinical	Clinical
Total	330	279	330	279
Respondent	131 (39.7%)	133 (47.7%)	208 (63.0%)	212 (76%)
Non respondent	199 (60.3%)	146 (52.3%)	122 (37.0%)	67 (24%)

Q1: Do you have any suggestion to be considered in future application of the blended learning system?

Q2: What are the challenges you think we have to overcome in future during application of blended learning system?

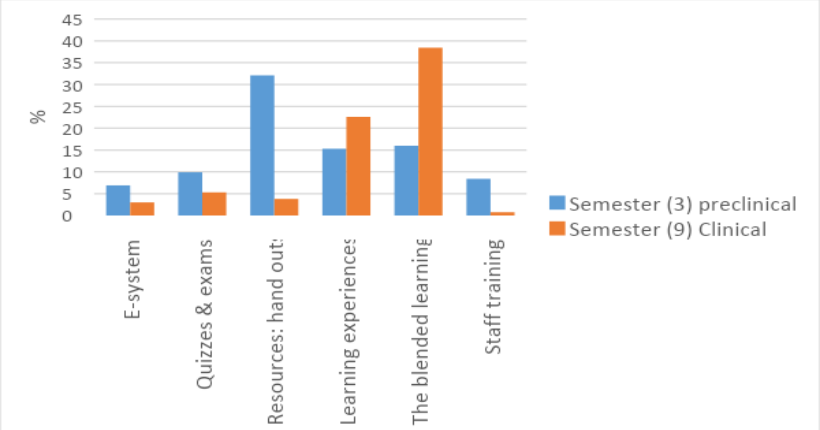

Fig (1): Percentages of preclinical and clinical phases students answer to question "Do you have any suggestion to be considered in future application of the blended learning system?"

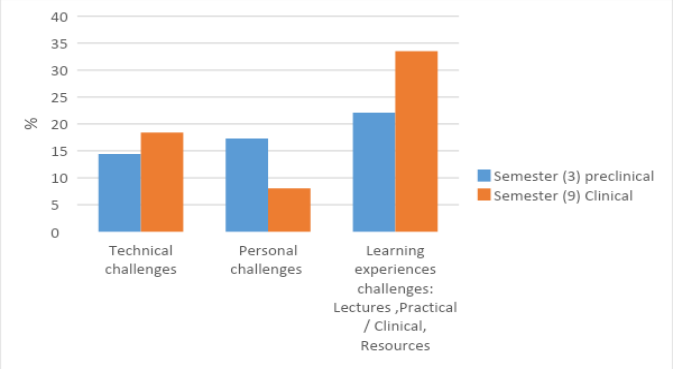

Fig (2): Percentages of preclinical and clinical phases students answer to question " What are the challenges you think we have to overcome in future during application of blended learning system?"

Regarding the open-ended questions number 1, the students asked for better management of Moodle, earlier lectures upload, faster website, and use different platforms. As well, conducting more quizzes (formative assessment) and allow longer time for quizzes, improve the quality, and increase the time of recorded videos or lectures. Regarding online discussion sessions, they asked for better time arrangements and more frequent conduction and increase number of available staff. Both categories of students asked for more time and frequency of practical and clinical training with more face-to-face communication with better organization and time management and more staff training to the new technology for better quality of E-learning sessions.

For Q2, students from both phases agreed that technical problems and bad internet connection are one of the major challenges facing blended learning system. effective communication of staff and students, better presentation skills are another important challenge. Lastly, improving the quality of practical sessions and lectures and resources, ensure integration and sufficient time allocated for practical sessions and clinical training.

IV. DISCUSSION

Blended learning is not supposed to replace the traditional instructor-led teaching, but to act as an adjuvant to it and during Covoid-19 era it was a must as no other solution was available. Our results showed that the students in both preclinical and clinical phases were satisfied with blended learning experiences to an extent. These results are supported by different studies which reported that medical and non-medical students are satisfied with E-learning [10]. Researchers had reported that students' satisfaction with the content and mode of delivery anatomy and physiology courses conducted using blended learning approach were satisfactory [11]. In addition, students' exam performance was reported to improve with the blended learning approach compared to traditional face to- face lectures [12].

In general, the less satisfaction with blended learning approach which we can assume it is due to the students' report of being more workload [13]. Also, within the context of blended learning, previous studies have revealed that computer self-efficacy and performance expectations are cognitive determinants of behaviour and that they are positively correlated to learner satisfaction [14]. Moreover, environmental factors such as system functionality, content feature (technological environment) as well as social interactions and collaborative learning (social environment) affect the perceived usefulness of blended learning [15].

In this study the younger (preclinical group) was more satisfied with the blended learning, this could be due to their higher level of mastery to technology and easy usage of it. Also, it could be due to the different scientific load which is more related to basic science not yet involving much clinical exposure. This explanation was supported by Dost as they stated that benefits to preclinical years of blended learning has been confirmed, for example, in anatomy. In addition, the younger generation is more accustomed to use YouTube and on the other hand, there is limited understanding of the impact of exclusive online teaching and its use in clinical years [16].

On the contrary, some researchers reported higher satisfaction of older students and it was explained by the concept that older students are more committed, self-motivated and self directed learner [17]. But, this finding, is different from the older report which said that online interaction environment is equivalent to learners of all age [18]. In addition, basing on the qualitative reports, it has recorded that students with a higher education level tend to positively perceive online learning [17].

This study also demonstrated unsatisfaction with the conducted clinical rounds which is also reported by Dost who found that a crucial concern among medical students was that online learning diminished the development of their appropriate level of clinical competence. They suggested this could be overcome with proficient use of social media platforms in helping medical education [16].

Lower level of satisfaction among students with blended learning could be explained with time constrains as the medical students especially are under pressure to find sufficient time to manage the new self-directed approach and maintain a work life balance personal life commitment. Another study added also that, lack of time appears to be linked with lack of incentives to engage with online or E-learning [19]. Perlman highlight time as a barrier against faculty engagement [20].

The results of this study demonstrated a better satisfaction among female student with the blended learning, this was opposed by findings of Venkatesh who reported that male students had a higher overall learner satisfaction than their female corresponds, which might be due to higher levels of computer self-efficacy and reduced anxiety in males compared to females [15]. On the same hand, previous literature had reported that lower perceived computer self-efficacy and higher computer anxiety among female students have an impact on their perceived satisfaction with blended learning [21,22]. Females are considered to be more of read/write learners, and they prefer learning environments that encourage communication and collaboration, while males are more kinaesthetic learners who prefer to have practical experiences [23].

Although, other research has supported the current study`s finding of higher prevalence of acceptance to blended learning among female students as females are reported to be more academically successful in the online version of the course than men. Research proposed that this is because females tend to be more reflective in their learning, and less hesitant to engage in the online environment. In addition, they are more in control over their learning [24]. As well, McKnight-Tutein and Thackaberry suggested that this mode of learning was women conducive to a high level of success for them [25]. Another explanation was suggested by Yoo and Huang who reported that female students have a stronger intrinsic motivation to take online courses than their male counterparts, as self motivation is considered as an important influencer on the success of online learning and this also was obvious as female did better on their assignments and exams, because they are more self-regulating. Women were also more likely to progress through set of tasks in a linear fashion, while men would jump ahead and run into problems [26].

According to the results of the present study, overall satisfaction of students (Egyptians and non-Egyptians) is nearly approximate to 50% with no significant differences in students' satisfaction between Egyptian and non-Egyptians in the preclinical phases. Meanwhile, in the clinical phase percentage of satisfied non-Egyptian students were significantly higher than then Egyptian peers. It can be explained by the fact that ethnic groups with an individualism cultural norm preferred web-based, interactive medium of communication while those with a collectivism cultural norm preferred a face-to-face interaction for a long-term relationship. Smith and Ayers conducted case studies of online learning and found that the student group with a high-context culture, such as Latino students, was dissatisfied with web-based learning as it was designed with a low context culture. Usually, the remote learning environment requires facilitating communication within different culturally diverse students to allow successful learning. This collaborative and interactive nature of blended allows cross-cultural interaction, which may explain the overall satisfaction toward online learning [27].

Reflecting on the results of the open-ended questions of this study, many factors were recorded to affect successfulness of the online learning, which could be categorized into student led factors to staff led factors [28]. Thus, in order to ensure robust evidence to support E-learning in medical education, it is crucial that account be taken to all perspectives including student, educator, training bodies such as schools or universities [19]. For instance, the cultural resistances among staff which could be used as a key to implement a successful E-learning. Pettersson and Olofsson's study referenced time as a barrier to the implementation of E-learning technologies [29]. They noted that there is limited time available for faculty to learn these new technologies which in fact damages self-confidence. The lack of time available also made faculty concerned about the pedagogical and organisational aspects of distance teaching. In order to allow educators, the necessary time to learn new technologies, institutions should allow protected time for educators to develop these skills, learn concepts and reflect on practices [30]. Having feelings as inadequacy, limited knowledge of or lack of proper training would affect the attitude of the staff. To overcome the personal mediated factors, we should promote a change of norms and attitudes of staff, students, and community toward online approach [19]. One of the recommendations of this study is to train the staff more about concept & conduction of online learning. Staff also might feel overwhelmed with the change which mandate them to be engaged with new technologies and tools rapidly [19] and having little patience for navigating minor technical issues [31].

One of major limitation of the E-learning part of blended learning is the decreased personal interaction between students and teachers. Although, they tried to overcome this obstacle by allocating time for live discussion and by the face-to-face interactions in the practical clinical rounds [10].

Another stated challenge by students was the lack of good quality infrastructure and technology friendly environment; this is considered a major challenge especially in the 3rd world countries. Facing unstable and slow internet connections, difficulty in purchasing high quality paid application for lectures recording, LMS and poor quality of supporting services created less satisfaction with the online part of the blended experience. This conclusion was supported by Attardi and Rogers` study which identified technical issues such as poor internet connectivity as barriers to live broadcasting of lectures in their institution in Canada [32]. Same reports about poor internet connection and infrastructures were registered in two different studies one from Cameroon [28] and the other from Iran [33].

V. CONCLUSION

In conclusion, the transition from traditional to blended learning is still facing many challenges. As students are perceiving the E-learning as a method to overcome the lockdown required to face covid-19 epidemic only and not seen as a change in the direction of their learning that activates the adult learning principals and that they are required to be more participatory and responsible for their learning which tends to be more self-directed as a nature for e learning, they are going to evaluate it less effective than face to face. So, explaining adult principles of learning to students and cultivating concept of active learning and lifelong learning is another major challenge facing blended learning system application. This was an attempt to understand how our students perceived the blended learning approach, its disadvantages and limitation to help us to get feedback and highlighted the required modifications for improving the delivery methods. As we think digitalization of medical education is a step forward mandate that the institution should moderate their resources to improve the student's perception and satisfaction towards it.

Limitation of the study:

This study was only conducted only on one semester, more studies needed to involve multiple semesters and use instruments other than questionnaires.

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