

The Students' Experience of Hybrid- Education Model at the University of Baghdad College of Pharmacy: Lessons and Future Directions

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Abstract

The impact of COVID-19 pandemic on education models was mainly through the expansion of technology use in the different educational programs. Earlier impact of COVID-19 was manifested in the complete and sudden transition to distance education regardless of institution preparedness status. Gradually, many institutions are moving back to on-campus face-to-face education. However, others including all higher education institutions in Iraq are adopting the hybrid education model. This report presents part of the end of semester evaluation survey conducted at the University of Baghdad College of Pharmacy for the Spring 2021 semester. The survey aims to address points of strength and weakness associated with the hybrid education model and specifically the virtual content delivery aspect of hybrid education. The outcomes of the end of semester evaluation will shape a better experience for upcoming years and guide distance education implantation in the program.

Keywords: E-learning, COVID-19, Hybrid education, Student satisfaction, Pharmaceutical education, Iraq.

تجربة الطلاب مع التعليم المدمج في كلية الصيدلة بجامعة بغداد: الدروس والتوجهات المستقبلية

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الخلاصة

اثر جائحة كورونا على نظام التعليم بشكل أساسي من خلال التوسع في استخدام التكنولوجيا في البرامج التعليمية المختلفة. تمثل التأثير الأولي لجائحة كورونا في الانتقال الكامل والمفاجئ إلى التعليم عن بعد بغض النظر عن حالة الاستعداد والجاهزية في المؤسسة التعليمية. فيما بعد وتدرجياً، بدأت العديد من المؤسسات التعليمية تعود إلى التعليم التقليدي الحضوري داخل الحرم الجامعي بينما تبنت مؤسسات أخرى ومنها مؤسسات التعليم العالي في العراق نموذج التعليم المدمج. يقدم هذا التقرير جزءاً من استطلاع تقييم نهاية الفصل الدراسي الذي أجري في كلية الصيدلة بجامعة بغداد للفصل الدراسي الثاني من العام الدراسي ٢٠٢٠ - ٢٠٢١. يهدف الاستطلاع إلى معالجة نقاط القوة والضعف المرتبطة بنموذج التعليم المدمج وعلى وجه التحديد الجوانب المتعلقة بتقديم المحتوى الافتراضي للتعليم المدمج. تساهم نتائج تقييم نهاية الفصل الدراسي في صياغة تجربة أفضل للسنوات القادمة وتوجه عملية تعزيز التعليم عن بعد في التعليم الجامعي.

الكلمات المفتاحية: التعليم الإلكتروني ، كوفيد - ١٩ ، التعليم المدمج ، رضا الطلاب ، التعليم الصيدلاني ، العراق.

Introduction

The use of Technology in Pharmacy Education Iraq

Prior to COVID-19, the use of information and communication technologies (ICTs) in pharmacy education in Iraq was largely limited. Few institutions were implementing technologies like electronic course management (ECM), on-line sessions, electronic exams, video lectures, and others. However, these were sporadic attempts. During the academic year of 2019 -2020, and in response to COVID-19 pandemic, all educational

programs were suddenly moved to distance education over the period of few weeks ⁽¹⁾. The sudden transition was a courageous yet challenging action step to continue the academic year requirement. However, the general lack of infrastructures and adequate training required for successful distance education forced the adoption of other education models for the academic year of 2020 – 2021.

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The Hybrid Education Experience for the Academic year of 2020-2021

The ministry of higher education and scientific research (MOHESR) decided that all universities and colleges will be adopting the hybrid education model for the academic year of 2020-2021. For medicine, dentistry, and pharmacy colleges and programs, it was determined that all lectures are to be delivered virtually. Mid-term exams are to be given online for all courses, final exams on the other hand were determined to be conducted as on-campus paper exams for 60% of core classes. Final exams for the remaining 40% core classes and non-core classes were determined to be administered on-line. The laboratory sections are to be delivered in a hybrid mode such that the lecture part and instructions for experiments are to be delivered virtually and students would come to perform the experiments in the lab on campus. This hybrid model of education allows maximum social distancing throughout the academic year by reducing the number of students present on-campus at any day. However, no further investments at infrastructures essential for distance education took place. In this format of hybrid education, distance learning represented a significant component of content delivery. As we reported earlier, distance education in Iraq is a fairly new experience that was implanted without prior planning or preparation ⁽¹⁾. Therefore it was important that faculty receive appropriate training on various tools used in distance education. The training was available through the supervision and scientific evaluation apparatus in the MOHESR, Continuing Education Center at the University of Baghdad, Continuing Education Unit and Ibn-Sina Unit for distance education at the university of Baghdad college of pharmacy (UOB CPharm), and others. Faculty members were highly encouraged to attend training courses and workshops on new tools in education and specifically distance education.

It is very important to maintain the quality of education regardless of the education model implanted. As such, synchronous lectures were the main content delivery mode in the distance education component of the academic year. Synchronous lectures were reported to be associated with a more positive learning experience compared to asynchronous delivery ⁽²⁾. However, all lectures were recorded and made available to students through the college YouTube channel. This is to address the issue of poor internet service that faces some students and cause them to miss the synchronous lecture.

End of semester evaluation

Student perceptions of the different components of the educational system is an integral part of "satisfaction with the educational program" which is a component of the "plan-do-check-act" cycle of quality assurance of education ⁽³⁾. End of

semester evaluation should be done regularly and annually. Results from the end of semester evaluation should be considered carefully to address areas of unsatisfaction without compromising the quality of the program. At UOB CPharm, end of semester evaluation has been regularly conducted. Some instructors distribute an end of semester evaluation for the course they teach. Instructors are encouraged but not required to distribute the end of semester evaluation. In the last two years, these evaluations have become very important due to the rapid changes in the education model enforced in response to COVID-19 pandemic. Over the course of 20 months, the students moved from attending lectures in lecture halls to full distance education and then partially back to being on campus in the hybrid education model. These rapid changes were enforced and implemented without sufficient preparations and necessary infrastructures. As such, these changes are expected to shift students' satisfaction with the educational program. Consequently, a central end of semester evaluation was conducted. The objective of the end of semester survey is to evaluate students' satisfaction with the hybrid model in general and more specifically with the virtual component of content delivery. Here we report the main findings of the end of semester evaluation and its future implications.

Methods

The end of semester evaluation had quasi experiment design to conduct post-intervention assessment of new (hybrid) educational approach. The survey was developed using google form.

The authors developed new survey items to evaluate the student perceptions toward the implementation of hybrid education model. The survey included measures evaluating students' satisfaction with synchronous and asynchronous lectures for the different courses they take, students' satisfaction with hybrid education in terms of scientific gain in distance education compared to traditional face-to-face education, hybrid mode of lab sessions, and in-class final exams following virtual delivery of course materials. Additionally, the survey included a section comparing the distance education experience for the current academic year (2020 – 2021) (hybrid education model) compared to previous year (2019 – 2020) (mostly distance education).

This last section is very important toward the success of information and technology implementation at the UOB CPharm where the college administration is actively working to expand the use of technology in different areas of the educational program. This section included measures of student perceptions of their skills in using google classroom and taking online exams, students' satisfaction with online exam management by the college, technical support services provided,

and the overall students' satisfaction with distance education this year compared to last year.

Lastly, the survey included a question on students' satisfaction with faculty understanding and support during the challenging times of COVID-19 and a question on student perceptions of misconduct carried out by some students who took advantage of COVID-19 pandemic to submit fake excuses and get permissions to skip assignments and quizzes.

Student recruitments

The survey was distributed to the students via their university emails at the end of final exams for the Spring 2021 semester with two reminders every three days. The participation was optional.

Statistical analysis

The analysis was conducted using the Statistical Package for the Social Sciences (SPSS, IBM, USA version 24). Means, standard deviations (S.D.), and medians of participant responses were calculated. A 5-points Likert scale (strongly disagree (1), disagree (2), neutral (3), agree (4), strongly agree(5)) was used for student responses. Kruskal Wallis test was used to compare means of

student responses to different questions according to their year of the study. A multiple linear regression analysis was used to identify predictors of student perception of the education model implanted by the college. The multiple linear regression measured the association between 11 independent variables and the outcome variable (In general, our college successfully implemented distance education imposed due to COVID-19). This survey was part of the end of the semester assessment.

Results and Discussion

A total of 548 student out of 1370 students responded to the survey giving rise to 40% response rate. Responses from students had a median score of agree (4) for most measures used except for the following three measure: "in general, our college successfully implemented distance education imposed due to COVID-19", "in general, the faculty members had good understanding of students' circumstances during COVID-19 pandemic", and "some students took advantages of the pandemic to not fulfill their academic commitments" which had a median score of neutral (3) (Table 1).

Table 1. The descriptive characteristic of the student perceptions about the college teaching modes.

	Measure	N	Median	Mean	Std. Deviation
A	Although all the lectures were virtual, in-class final exam improved my scientific gain compared to online exams.	544	4	3.29	1.33
B	Having the practical part of the lab on campus improved my understanding even though the lecture part of the lab was virtual	544	4	3.35	1.27
C	hybrid education model is better than distance education	543	4	3.53	1.27
D	It would have been better to have the whole lab session on campus	545	4	3.57	1.32
E	My scientific gain in distance education component is similar to in-class education	433	3	2.64	1.30
F	In general, the experience of distance education this year is better than last year	432	4	3.45	1.12
G	In general, the management of online exams this year is better than last year	432	4	3.50	1.04
H	My skills in using Google classroom this year is better than last year	432	4	4.11	0.78
I	My skills in taking online exams this year is better than last year	432	4	4.03	0.81
J	The technical support unit in the college was able to help resolve technical issues related to distance education	543	4	3.68	0.90
K	The college administration worked hard to support the success of distance education	542	4	3.57	0.91
L	I hope to continue using google classroom to distribute instructions and class materials after the resumption of full on-campus education	450	4	3.83	1.28

Continued table 1.

	Measure	N	Median	Mean	Std. Deviation
M	I will continue using university email to communicate with my instructors after the resumption of full on-campus education in the upcoming years	450	4	3.78	1.05
N	In general, our college successfully implemented distance education imposed due to COVID-19	432	3	3.38	1.00
O	In general, the faculty members had good understanding of students' circumstances during COVID-19 pandemic	544	3	2.71	1.07
P	Some students took advantages of the pandemic to not fulfill their academic commitments	543	3	3.19	1.11

Seven factors had significant (P-value < 0.05) positive association with the outcome variable according to the regression analysis (Table 2). The seven significant positive factors included the students' perceptions of the hybrid teaching compared to the in-class teaching, perceptions toward in-class exam, this year experience with

virtual learning, the administration of the virtual exams, skills of using Google Classroom, technical help with the college team, and the college efforts to enhance the virtual learning (Table 2). A more detailed presentation of the end of semester evaluation outcomes is presented below.

Table 2. Multiple linear regression of factors associated with student perceptions toward college hybrid education approach.

Measure	Standardized Coefficients (Beta)	P- value
My scientific gain in distance education is comparable to my gain in traditional face-to-face learning in the previous years	0.186	0.0001*
Although all the lectures were given virtually, the in-class exams enhanced my scientific knowledge compared to online exams	0.100	0.009*
Attending the practical side of the laboratory on campus helped me to understand the material better even though the lecture part was given online	0.064	0.127
Hybrid education model in the practical course is better than distance education model	-0.080	0.067
In general, virtual learning experience this year is better than last year	0.192	0.0001*
In general, online exams administration and management is better this year compared to last year	0.171	0.0001*
My skills to use google classroom this year is better than last year	0.102	0.044*
My skills in taking and submitting online exams this year is better than last year	-0.068	0.180
The electronic education unit team in the college was able to help me resolve technical issues experienced in distance education	0.127	0.001*
The college administration worked hard to support the success of distance education experience	0.321	0.0001*
In general, the faculty members had good understanding of students' circumstances during COVID-19 pandemic	0.007	0.853

*Significant, P-value < 0.05. Dependent variable: In general our college successfully achieved virtual learning due to COVID-19. Seven factors significantly (P-value < 0.05) positive associated with the outcome variable according to the regression analysis.

Students' Evaluation of the Hybrid Education Experience

The hybrid education model implemented for the theoretical part of the courses included online lectures and in-class exams. The in-class exams were important to ensure the integrity of the exam given the limited resources that hinder proper online exam proctoring. Virtual delivery of the theoretical part was conducted in a synchronous and asynchronous mode. For the practical (lab) sessions,

the lecture part was given electronically, and students performed the experiment on campus.

Student perceptions of the usefulness of synchronous lectures for their learning was trending toward neutral with an appreciable percentage of students expressing an attitude of disagree (Figure 1A). Student perceptions were trending toward an attitude of agree for the usefulness of video lectures for their learning (Figure 1B-C). These outcomes are mainly driven by the poor internet services in Iraq pertaining to non-optimal synchronous lecture experience.

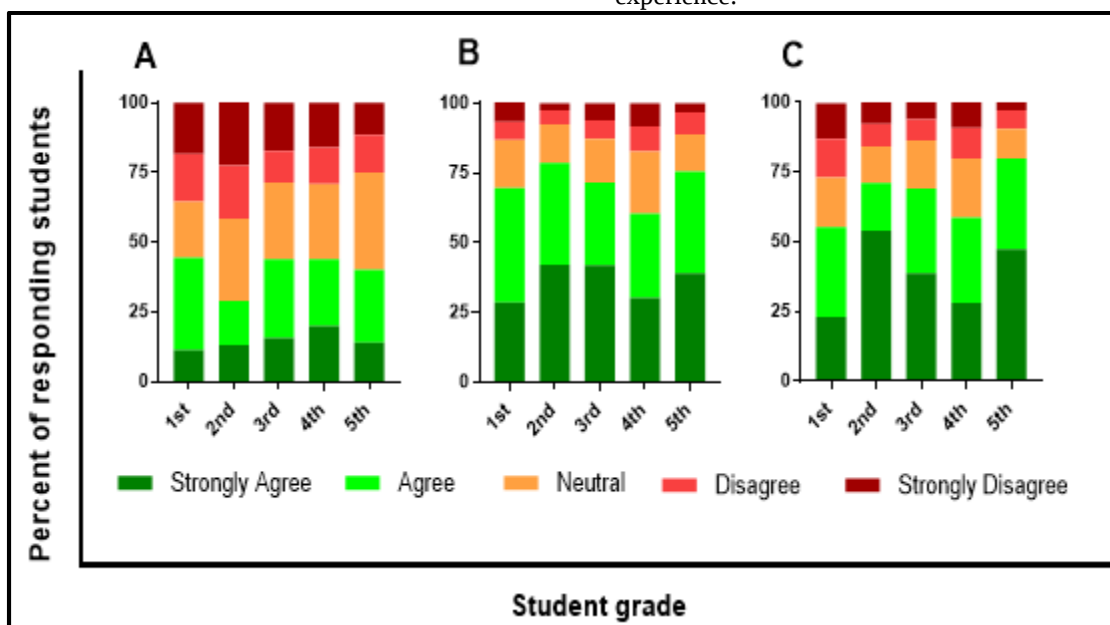


Figure 1. Student perceptions on the different modes of virtual content delivery used in the hybrid education model. A: synchronous lectures helped me understand the materials better, B: recorded video lectures that can be streamed on YouTube is one of the advantages that came with distance education implementation, C: I prefer watching recorded video lecture over attending the synchronous lecture

Students' responses on the different measures on their experience with hybrid education showed a median score of agree (4) (Table 1 (A-D)). Students perceived hybrid education to be better than e-learning for the lab sections of the courses where the majority of students agreed that attending the lab and performing experiments improved their learning (Figure 2). However, students expressed their preference for traditional on-campus full lab section over the hybrid mode. The majority of students agreed that paper exams improved their learning outcomes compared to online exams (Figure 2). While an appreciable percentage of students perceived distance education to be equally

beneficial for their learning to traditional education, a good proportion of the students disagreed resulting in a median score of neutral (3) for that measure (Table 1E). It is worth noting that student perceptions of their scientific gain in distance education compared to face-to-face education and the improvement of their scientific gain when giving in-class final exams had significant positive association with their perception of the college success in the distance education experience (Table 2). These results are well expected giving the young age of experience for the faculty and the students with education models other than face-to-face education.

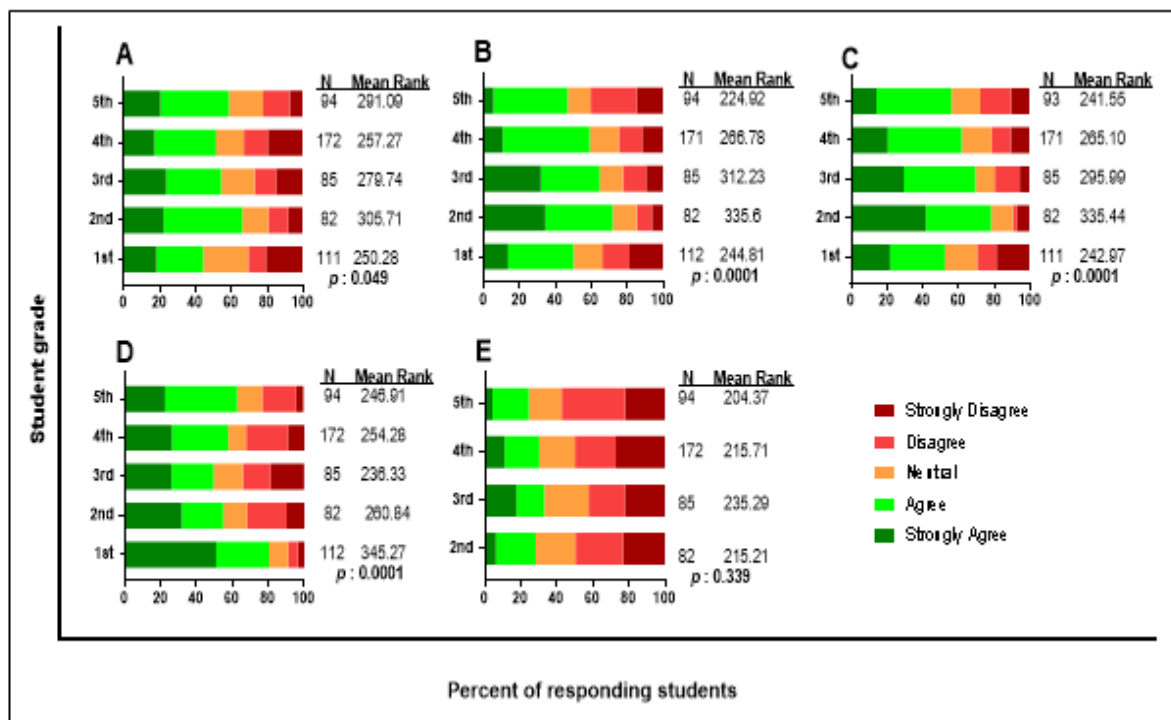


Figure 2. Student perception of hybrid education model implemented during the academic year of 2020-2021. A: Although all the lectures were virtual, in-class final exam improved my scientific gain compared to online exams. B: Having the practical part of the lab on campus improved my understanding even though the lecture part of the lab was virtual. C: hybrid education model is better than distance education. D: It would have been better to have the whole lab session on campus. E: My scientific gain in distance education component is similar to in-class education. Kruskal Wallis test was used to compare means of student responses to different questions according to their year of the study. N: number of students responding to the survey.

Student perceptions of the distance education experience compared to previous year

Even though the academic year progressed in the hybrid model, the virtual component was still heavy compared to education prior to COVID-19. While this was only the second academic year at which distance education is being implemented, it was not expected to be the last. This is because the COVID-19 pandemic that enforced distance education is still ongoing. Additionally, the administrations both at the university and college levels are determined on expanding the size of information and technology use in education as one mean of improving educational outcomes and institution performance⁽⁴⁾. As such, it was important to learn about students experience with e-learning this year compared to previous year. The majority of students agreed that they had a better experience this year and that the management of online exams by the college was improved from last year where their responses showed a median score of agree on both measures (Table 1F-G, Figure 2A-B). This outcome can be driven by improved students' skills in using the ECM system (Google classroom) and in taking and submitting online exams. Both of these measures showed median score of agree (4) where only 20% or less of students in any level disagreed (Table 1(H-I), Figure 3(C-D)). Other factors that can

contribute to students' better experience is administration efforts and technical support provided by the e-learning unit at the college. All of these measures had a significant positive association

with student perceptions of the college success in distance education implemented in response to COVID-19 pandemic (Table 2).

Students' evaluation of the semester is significantly different across the different grades of the study program.

The extent of experiencing the different models of education (face-to-face, hybrid, distance) was different for students in the different grades of the study program (Figures 2-4). To elaborate, first and second year students did not experience traditional face-to-face education at the college level before as they were admitted into the program shortly before or during COVID-19 pandemic. On the other hand, third-, fourth-, and fifth-year students experienced the traditional education model during the earlier year(s) in the program before they were forced to transition to distance education due to COVID-19. These different experiences were reflected in student perceptions of the semester and the academic year. Indeed, first and second year students' responses showed the highest level of significant differences by the pairwise comparison

test conducted for the different measures in the end of semester evaluation. Responses from the first- and second-year students showed higher ranked mean compared to students in other levels in questions on their willingness to continue using

google classroom and university email for the remaining of their years in the study program (Figure 4).

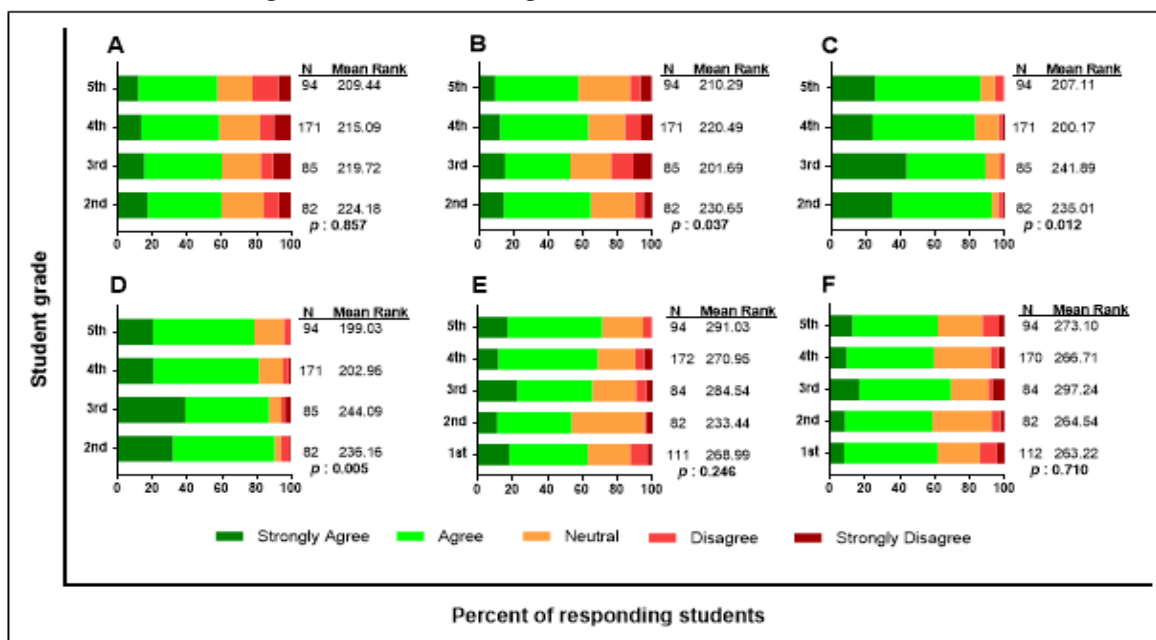


Figure 3. Student perceptions on the distance education experience during the academic year 2020-2021 compared to that during the academic year 2019-2020. A: In general the experience of distance education this year is better than last year, B: In general the management of online exams this year is better than last year, C: My skills in using Google classroom this year is better than last year, D: My skills in taking online exams this year is better than last year, E: The technical support unit in the college was able to help resolve technical issues related to distance education, F: The college administration worked hard to support the success of distance education. Kruskal Wallis test was used to compare means of student responses to different questions according to their year of the study. N: number of students responding to the survey.

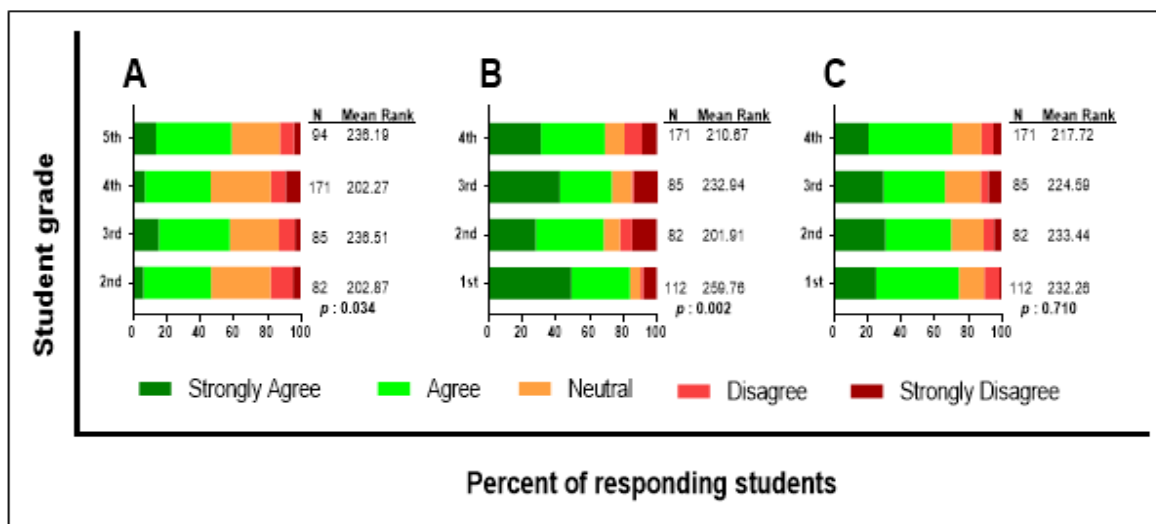


Figure 4. Student perceptions of the overall college performance in distance education and their intention to continue using ICT tools following the complete resumption of on campus face-to-face education. A: In general our college was able to succeed in the distance education experienced implemented in response to COVID-19, B: I hope to continue using Google classroom to receive notification, assignments and class materials even after fully going back to on campus face to face education, C: I will continue using university emails to communicate with my instructors after the resumption of on campus face-to-face education. Kruskal Wallis test was used to compare means of student responses to different questions according to their year of the study. N: number of students responding to the survey.

On the other hand, responses from last year students showed the highest ranked mean, though not significantly different, to the question on student perceptions of technical team (Ibn-Sina Unit for e-learning) capabilities in providing required support (Figure 3E). This possibly indicates a higher level of appreciation from the senior students to the efforts put by the college in transitioning from close-to-zero electronic communication to fully functioning electronic management system of communication and course delivery. First and second year students started their academic study with or after the establishment of formal electronic communication system. These students experienced distance education starting in their first year. Video lectures and handouts were made available early in their study. As such they would have higher expectations for electronic services at the college.

Challenges in distance education implantation and future directions

The overall rating of the college success in distance education showed a median score of neutral (3) (Table 1). As mentioned earlier, students had a median score of agree for their willingness to continue using Google classroom and university email for the remaining of their study program. This is a very good improvement from a study conducted at the beginning of distance education implantation in mid-2020⁽⁵⁾. The earlier study covered ten colleges of pharmacy in Iraq including the UOB CPharm and reported a median score of disagree (2) for students' intention to use electronic course management. Even though the two reports are one year apart, the magnitude of improvement in the quality and extent of use of electronic course management (Google classroom) is big. The earlier study reported students' response shortly after the sudden transition to distance education where neither students nor faculty were trained enough for such transition. This current report comes after about two years of using Google classroom as an electronic course management platform at UOB CPharm. These results reflect the importance of appropriate training for the implementation of a new educational tool.

While the aforementioned outcomes about students' intention to continue using ICT in education are very promising, the actual implantation might be hindered by lack of essential resources. Poor internet service, limited free internet service on campus for most institutions, lack of financial allocations required to provide essential exam monitoring services, limited number of technical support workers, and resistance of some faculty and students (anti-technology behavior) are only some examples of missing resources that challenge ICTs implantation in education in Iraq.

Concluding remarks

The level of ICTs implantation in education in Iraq has been directly affected by

COVID-19 pandemic. Given the limited infrastructure and resources available for proper ICTs implantation, the MOHESR is actively working to balance the quality of education and safety requirement enforced in response to the pandemic. Hybrid education model was adopted in all universities and colleges including the UOB CPharm. Virtual content delivery represented the main platform of the academic year of 2020 – 2021. The UOB CPharm has come a long distance in managing distance education which was well reflected in students' response in the end of semester evaluation. The students expressed their appreciation for the administration effort and the technical support provided in virtual content delivery. An important outcome was students' intention to continue using Google classroom as the ECM platform and their university email in their education. The next step should be to continue using ECM and university emails after the full resumption of face-to-face education. Moreover, virtual class meetings can be utilized to encourage international collaborations where educators from distant universities can be hosted to deliver content as part of the educational program curriculum. The academic year of 2021 -2022 was determined by the MOHESR to be mainly in the traditional face-to-face model for all core classes. This will put the college administration in a true challenge to continue using ICTs in education and at the same time might make their use more acceptable by the students. Indeed, Google classrooms are being used as the ECM at the UOB CPharm. The platform is mainly used to deliver handouts, assignment, notifications, and other course related materials. It is expected that such strategy will result in a better learning experience pertaining to higher level of student satisfaction with ICTs implantation for the academic year of 2021 – 2022.

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