COVID-19 Pandemic Endorses New Era of E-learning
Case Study: Hashemite University

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Abstract

Technology has affected the development of the education process over time. COVID-19 pandemic has forced educational facilities to close. Consequently, transformation from face-to-face educational approach to the E-learning approach has pushed the world to enter a new state of learning. This situation has elicited doubts about the implementation and the difficulties related with this immediate action. In this paper, statistical analysis was used on the filled survey by the instructors and students at the Hashemite University (HU) to investigate the quality of the E-learning process. Various factors such as e-content, Virtual Classroom (VC) and Learning Management System (LMS), and Technology Infrastructure affect E-learning process. A contradiction between instructors' and students' opinions regarding the usage of the E-learning at HU exists. Therefore, a set of recommendations was made to overcome the shortage in the E-learning process and to reach a full satisfaction about the quality of its implementation in future.

KEYWORDS: E-Learning, COVID-19, E-Content, Virtual Classroom (VC), Learning Management System (LMS), HU.

1. Introduction

COVID-19 has forced people to commit to social distancing to slow down the spreading of the virus which led to drastic changes in our daily lifestyle. All universities globally and specifically in Jordan were closed. At that time, instructors and students were sitting in different locations where they were using various communication technologies to connect with each other. The students and instructors were forced to transfer from face-to-face traditional approach to a fully E-learning approach which showcased the challenges that students and instructors had to face for the rest of the academic year. This transformation includes moving from the digital resources that are used in the traditional approach to employ one of the different Learning Management Systems (LMSs).

The usage of E-learning in Higher Education Institutes (HEIs) increased rapidly during the last few years, however, it was not commonly used in Jordan (Al-Shboul, Rababah, Al-Saideh, Betawi, & Jabbar, 2013) and (Alkhawaja & Halim, 2019). E-learning has multiple benefits and limitations as listed in Pujari, Sharma, & Jathar (2020), Levine & Sun (2002), Buttar (2016) and Wilp (2020). The process of correctly implementing E-learning required approval from directors and continuous technical support as mentioned in Almarabeh & Mohammad (2013), Raheem & Khan (2020), Nenko, Kybalna, & Snisarenko, (2020), Wargo (2020), Fayyoumi, Idwan, AL-Sarayreh, & Obeidallah (2015) and Mahalakshmi & Radha (2020). However, this procedure was not widely used until the lockdown caused by COVID-19.

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This has negatively impacted the face-to-face teaching approach and the proper implementation for E-learning was suddenly necessary.

Due to the current pandemic, the need for the E-learning approach dramatically increased. It can be utilized as an alternative solution to provide a high-quality e-content material as well as unceasing communication between the students and their instructors. It provides multiple tools for students to be used to improve their critical thinking skills, leadership, self-motivation and exhibit commitment. The spreading of COVID-19 raised the sudden demand to this change for all majors at the Hashemite University (HU). This study aims to address the following research questions during pandemic:

- *Research Question 1: How did the students and instructors practice E-learning principles on daily basis?*
- *Research Question 2: Was the E-learning process at the HU enhanced by evaluating the current situation and estimating different kinds of shortages to overcome them in future?*

To answer these questions, we investigated the most effective factors in the E-learning process from the students' and instructors' perspectives. These factors are e-content, Virtual Classroom (VC) and Learning Management System (LMS), and Technology Infrastructure. The main objective of this paper is to assess the quality of the E-learning process to guarantee that the faculty, students and decision makers were satisfied with this transformation. Since nobody knows when this pandemic will be over, the E-learning approach is considered as a solution to keep the continuity of the educational process during the coming semesters.

This paper is organized as follows: Section 2 presented the literature review. The research method is presented in Section 3. Section 4 illustrated results and discussions. Recommendations and conclusion were illustrated in Section 5 and Section 6, respectively.

2. Literature Review

Information and Communication Technology (ICT) role is rising sharply in today's educational systems all over the globe. The unpredicted transition to E-learning caused by the lockdown during COVID-19 pandemic required ICT to be integrated into education to replace the traditional face-to-face learning overnight in almost all HEIs in the world.

E-learning has many benefits and limitations. Pujari, Sharma, & Jathar (2020) showed the effective use of ICT in higher education world. It inspires students, allows fast communication across geographical distances, develops students' hypertext skills, and stimulates teachers to learn new skills and teaching techniques.

HEIs usually fall in several mistakes while introducing ICT to education. Buttar (2016) presented the technological systems that might be imposed from the top down not involving faculty and students nor considering content availability and students' needs.

Wilp (2020) presented skills to be practiced, new platforms and tools to be used, teaching approaches and learning outcomes to be revised due to COVID-19. Raheem & Khan (2020) reviewed the role of E-learning in COVID-19 crises. The study explored the E-learning tools that have been used in India and many other countries from all over the world during the lockdown period such as China, Turkey and Iraq. Nenko, Kybalna, & Snisarenko (2020) investigated the state of distance learning in Ukrainian HEIs during COVID-19 pandemic; provided types, effectiveness, negative and positive aspects, faced problems and proposed solutions by getting the feedback from students through an online survey. Mahalakshmi & Radha (2020) stated that students have become more comfortable with online education due to the student's interaction with the multimedia content according to their needs, time and commitments while no physical travel is required. Sahu, (2020) highlighted the influence of the COVID-19 outbreak on education and mental health of students and academic staff. Sahu, (2020) raised several questions about shifting from face-to-face to online classes and how would this affect students and instructors without laptops or internet access, universities with poor technological infrastructure, labs and practical courses. Other doubts were also raised about the assessment and evaluation techniques as they should be revised to fit the online mode, difficult to be monitored to prevent cheating, and the labs and practical courses are difficult to be delivered and assessed online.

COVID-19 pandemic enforced HEIs to reimagine teaching, learning delivery, assessment and accreditation. Wargo (2020) recommended that the education should be viewed as mixture of both physical places and digital spaces in order to provide equity of access to higher education. Daniel (2020) provided guidance to teachers and institutions during COVID-19 that addressed several issues such as: remote-teaching preparation addressing students' needs, introducing LMS, developing curricula and designing assessments. Agarwal & Kaushik (2020) recommended to use online learning in the postgraduate training in their institution after the pandemic as they found it feasible and cheap.

The Jordanian government has recognized the importance of integrating E-learning to support education. An E-learning steering committee was formed by the Ministry of Higher Education and Scientific Research (MoHESR) and a national E-learning strategy for higher education in Jordan for the period 2007-2010 was articulated to support HEIs to transform education into high quality, learner-centric

system by embedding E-learning (MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC, 2009).

However, several organizational and cultural challenges hindered the implementation of E-learning at HEIs in Jordan. Fully online education is actually not implemented in Jordan as the MoHESR does not accredit such type of education and requires student's regular attendance in order to get a degree (Al-Shboul, Rababah, Al-Saideh, Betawi, & Jabbar, 2013). Hence, E-learning has been implemented in the universities of Jordan as a supporter for the traditional face-to-face education solely. However, recently the ministry allowed students to take not more than 25% of their credit hours online. Al-Shboul, Rababah, Al-Saideh, Betawi, & Jabbar (2013) illustrated the challenges raised by implementing E-learning at HEIs in Jordan. Also, Alkhawaja & Halim (2019) listed several problems that affected the adoption of E-learning in Jordan such as technical issues, computer illiteracy, poor time management and lack of self-motivation.

The implementation of E-learning should be gradually achieved with patience, encouragement, and continuous technical support (Almarabeh & Mohammad, 2013). However, the lockdown forced by the quarantine did not allow things to go as ideal as that in most HEIs in the world. HEIs needed to convince instructors and students overnight to accept and leverage ICT in education.

The case in the HU was somehow better. The HU is a public university in Jordan, located in Zarqa. The HU is well-known for its leadership in the field of E-learning among its peers in Jordan and Middle East. An E-learning center was established in the early 2007. Several E-learning tools were offered to all faculties to encourage them to practice the learning process via Blackboard LMS, Lectora authoring tool, Tegrity Lecture Capture, and Illuminate Live. Furthermore, several training courses were held to qualify instructors to use these tools professionally. Therefore, several E-learning activities were practiced such as designing e-content for several courses, recording and broadcasting lectures to other universities locally and regionally. Later, HU moved to a customized version of the open-source Moodle LMS. By the year 2019, most of the courses offered by the departments of the university were converted into e-content to support the face-to-face approach. Fayyoumi, Idwan, AL-Sarayreh, & Obeidallah (2015) explored the effect of the infrastructure, regulations and rules, e-course, student and instructor factors on the E-learning process at HU. The results showed statistically that all these factors had a medium effect on the E-learning process according to the survey's participants. This indicated that HU has succeeded in mitigating the negative effects of these factors.

3. Materials and Methods

Herein we briefly describe our method in obtaining the argued results by recognizing the target sample and the appropriate statistical tool used to undertake this analysis. The target group in this paper were divided into two categories: Students and Instructors at the HU. These categories represent the main actors in the E-learning process. In general, the instructor depicts the teaching and learning environment by determining the instructional plan of the course that is aligned under the course learning outcomes. Moreover, the instructor is the one who selects the most appropriate LMSs that increase the students' engagement and allow students to use the course material productively. Meanwhile, the students need to be more active during the E-learning process by recognizing the e-content materials, the platform, the different kinds of interactions including quizzes, assignments and other assessment tools.

The questionnaire was answered by 16,383 out of 17,000 students and 382 out of 400 instructors covering all faculties at HU in May 2020. The purpose of the questionnaire was to assess the quality of the E-learning process during COVID-19 pandemic from the perspective of the two primary actors in this process. The rate of the accepted sample was 96.4% for students and 95.5% for instructors. The questionnaire consists of three demographic information while the remaining questions were used to measure the main factors affecting the quality of the E-learning process.

The demographic questions include gender, faculty and scientific degree in the students and instructors survey as shown in Figure 1 and Figure 2, respectively.

Each question in the distributed survey had a possibility of four-point Likert scale. A Likert scale forms opinion due to missing safe 'neutral' option. For example, each of the four responses would have a numerical value as follows: Strongly agree = 4, Agree = 3, Disagree= 2, and Strongly disagree = 1.

The percentage of the evaluation of the E-learning was investigated by itemizing number of factors. These factors play predominant role in the E-learning process as shown in Figure 3. These factors are e-content, VC and LMS, and Technology Infrastructure, as follows:

Technology Infrastructure
In the past five years the telecommunication companies in Jordan positively contributed to the education transformation from the traditional approach to the E-learning approach in schools, colleges and universities (Int@j, 2018). This infrastructure includes high speed internet bandwidth and different communication technologies such as computers, laptops, smart phone, tablets etc.

Virtual Classroom and Learning Management System

The E-learning process is nothing more than a homogenous integration between the LMS and VC. This integration is utilized to upload the required materials and to establish the synchronous or asynchronous communication between the instructors and students. The LMS is a software application that is used for the management, documentation, tracing, and reporting the learning process (Turnbull, Chugh, & Luck, 2019).

Moodle, Blackboard, and MS-teams are examples of LMS. While VC is a digital replica of a traditional classroom where the instructors and students can meet digitally instead of face-to-face. Zoom, Facebook, WhatsApp and Skype are examples of VC.
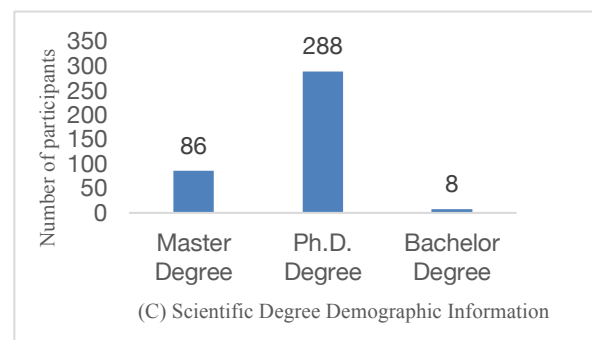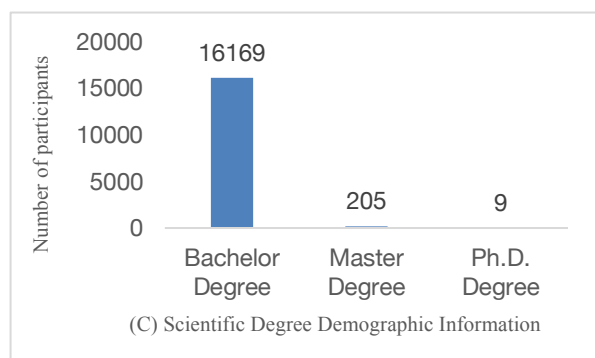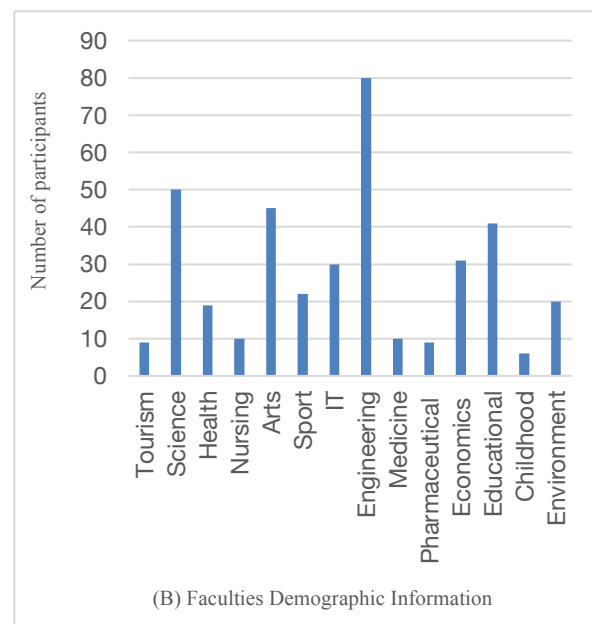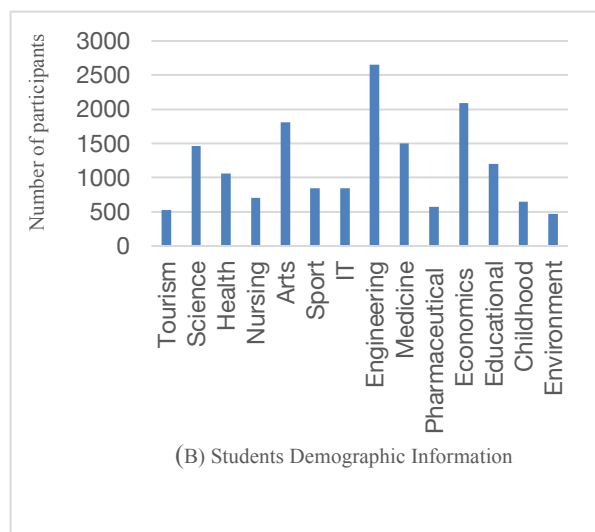

(A) Age Demographic Information

(B) Students Demographic Information

(C) Scientific Degree Demographic Information

Figure 1 - Demographic information for students at the HU.

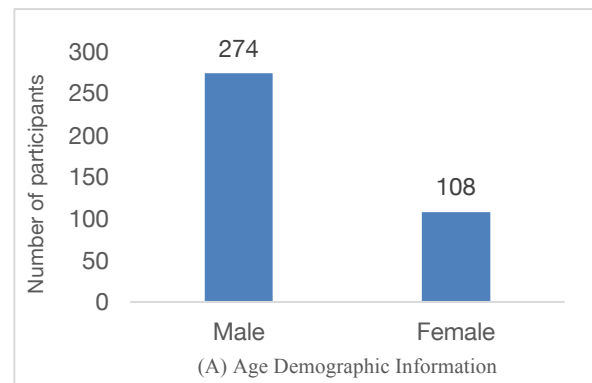(A) Age Demographic Information

(B) Faculties Demographic Information

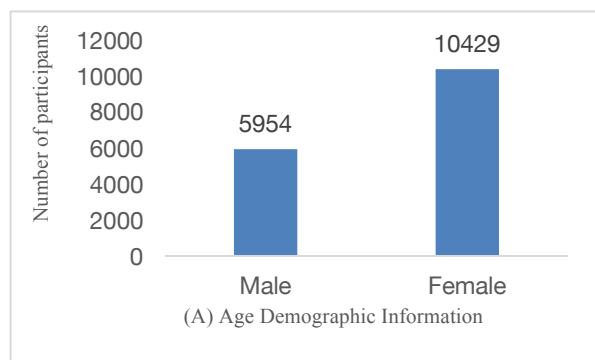(C) Scientific Degree Demographic Information

Figure 2 - Demographic information for instructors at the HU.

E-content

E-content is a digital transformation of the course content via the internet. It is fundamental to maintain its good quality. This is because, it is the top of the E-learning paradigm as shown in Figure 3 and it plays a key role in achieving not only a complete E-learning process but also preserving its high quality. This transformation requires an expert in the subject area and instructional designer who is responsible to develop the structure and the sequence of the topic in the course.
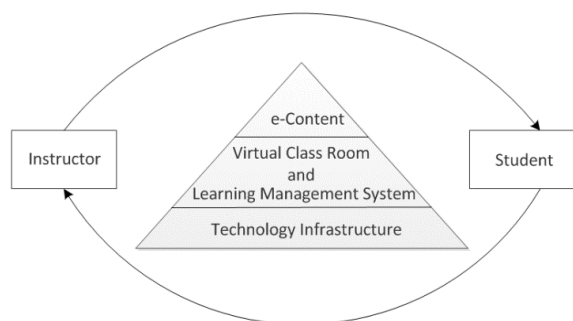

Figure 3 - The most effective factors in the E-learning process at the HU.

4. Results and Discussions

To the best of our knowledge the traditional learning restricts the time and the location. This type of learning is supervised and driven by the instructor regarding running classes, opening discussion, and initiating other activities. On the other hand, the E-learning is a more flexible type of learning, where some of the duties are moved to the students such as getting the education they seek for in their own convenient time and inside their comfortable homes. The statistical analysis of these factors was restrained by a set of criteria such as:

Technology Infrastructure

As mentioned earlier, the technology infrastructure measures the availability of the high-speed internet and the accessibility to different communication devices. Figure 4 shows the students and instructors responses at HU regarding the infrastructure technology factor. It is clearly shown that most students and instructors have a machine/device that was used during the E-learning process with 84.7% and 78.3% respectively. This is due to the escalation in the usage of smart-phones and computers/laptops in Jordan. In addition to that, the transformation to 4G services expands the number of the Internet users that reached up to 88.80% (Int@j, 2018). It's worth mentioning that 15.3% from students and 21.7% from instructors suffer from having their own devices to attend/give and prepare the lectures. This presents a well-known phenomenon that envaded social media and the newspapers at that time which is

the burden on the family to afford a device for each member.

During COVID-19 pandemic, a quick response has been received from the three largest telecommunication companies (Zain, Orange, and Umniah) in Jordan. This was presented by providing affordable internet-bundles for students at universities based on understanding their needs to stay at home. This justifies the obtained results that showed there was no problem with the internet high speed bandwidth as 55.8% from students' perspective. This consequently encourages the student to enroll in the E-learning process, although it contradicts the obtained results in (Sathishkumar, Mahalakshmi, Kumar, & Saravanakumar, 2020). While it presents a problem with 59.2% from the instructors' perspective.
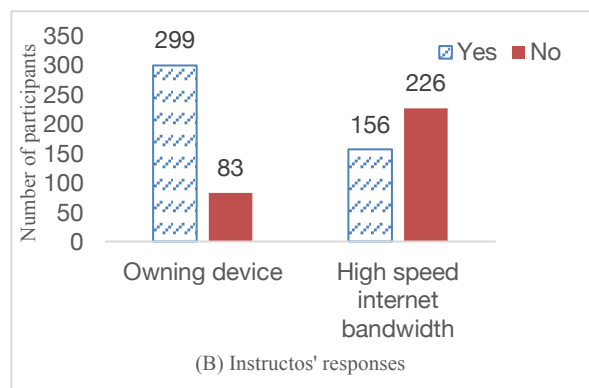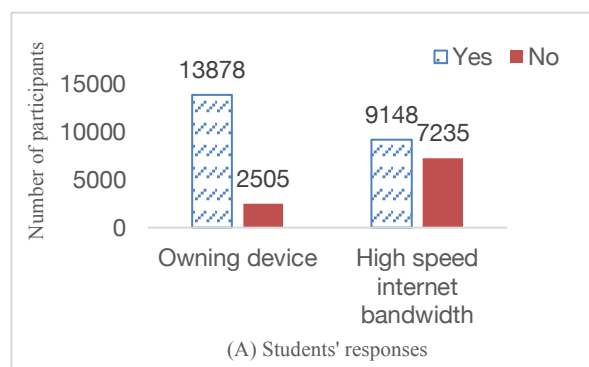

(A) Students' responses

(B) Instructos' responses

Figure 4 - Technology infrastructure factor.

This refers to non-existing support from the telecommunication companies to instructors during COVID-19 pandemic. Taking in consideration that the instructors have more duties that consume a huge amount of the Internet data usage such as upload the required e-content material and initiate the virtual classes. These low percentage values are not accepted from our point of view due to reductions in the quality of the E-learning process. Further efforts are required from the telecommunication companies in Jordan to guarantee good quality of services to various regions in Jordan.

We found that the perceived results are coherent with the results claimed in (Ferri, Grifoni, & Guzzo, 2020) cross Europe and, in particularly, UK.

Virtual Classroom and Learning Management System

It is well-known that the instructor is the person who is responsible in choosing the most appropriate LMS. He/she uploads course materials to achieve learning goals and prepares assessments, quizzes and tests to estimate the students' progress. The only left task is to determine whether the VC is synchronously or asynchronously to be broadcasted via appropriate tools.

Figure 5 shows the percentage of different used kinds of the VC tools during the pandemic period at the HU. It is clearly shown that MS-teams, Facebook, Zoom and other tools (i.e., WhatsApp and Skype) were used by instructors with 61%, 21%, 7%, and 11% respectively. Our results showed that MS-teams was the prevalent VC tool, while the Zoom is the dominant one in India (Sathishkumar, Mahalakshmi, Kumar, & Saravanakumar, 2020).

Our study intended to examine the differences between the various utilized VC tools in the instructor population by invoking Pearson Chi-Square test. This test informs us that there was a statistically significant difference between the various VC tools. The calculated Chi-square value was equal to 134.241 with an associated significant p-value = 0.000, which is greater than the alpha (α =0.05) to the benefit of MS-teams. The Crisis Management Committee at HU prepared the emergency plan to overcome this pandemic by training the students and instructors by using short videos and tutorials via MS-teams for explaining and exploring different VCs communication. Every single faculty at the HU used all the previous mentioned VC tools with different percentages. The MS-teams were maximally used by Faculty of Pharmaceutical Sciences as 88.9%, while Facebook was maximally used by Queen Rania Faculty of Tourism and Heritage as 77.8%. In the other hand, the Zoom tool was maximally utilized by Prince Al-Hussein Bin Abdullah II Faculty of Information Technology as 36.7%, and the other VC tools were maximally utilized by the Faculty of Engineer.

The VC had been evaluated as a factor that can affect the quality of the whole E-learning process during the pandemic from the perspective of students and instructors. In our study, we compared the students' behavior and the instructors' behavior based on attending/running the virtual classes and the interaction between them. It is important to highlight that the evaluation of the E-learning process from the students' perspectives during the pandemic was 2.32 out of 4.00 as a Low. Moreover, this result is consistent with the students' behavior where the mean value of their synchronous attending to the virtual classes was 2.88 as perceived Average factor where their VC synchronousness interaction was 2.21 which exceeds the 76% of the attendees. This indicates that the learning process is smoothly running, and the students are more active in the class. Consequently, this increased the quality of the E-learning process. It is essential to highlight that the infrastructure factor (device/internet speed) affect the way chosen by students to either attend the class synchronously or asynchronously. On the other hand, the evaluation of the E-learning process from the instructors' perspectives during the pandemic was 3.13 out of 4.00 as an Average. Also, this result is aligned with the instructors' behavior where the mean value of their running the VC was 3.9 as perceived High factor. While their interaction with the students inside the VC was 2.78 as perceived Average factor.

The evaluation of the E-learning process during the pandemic is classified as Low perceived factor in our results as well as many other obtained results such as (Mahyoob, 2020), (Berezhna & Prokopenko, 2020), and (Marinoni, Land, & Jensen, 2020).
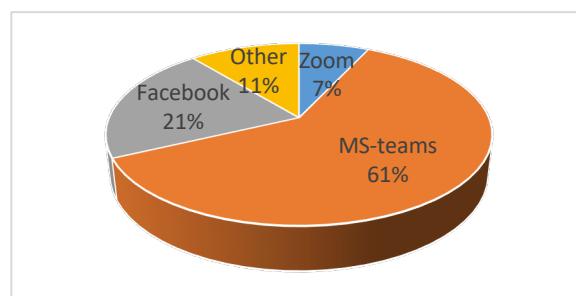

Figure 5 - The percentage of different used of VC tools during the pandemic period at the HU.

E-content

It is worth mentioning that the presidency office at HU sought to transform the campus into a smart campus. One of the predominant elements of the smart campus is to prepare online contents for the offered courses all over the faculties. This goal was monotonically achieved throughout the past five years. During the pandemic, HU electronically prepared all e-content for the offered courses to be ready and posted on Moodle. The effectiveness of the e-content of the offered courses at HU was estimated during the pandemic by measuring the quality of the e-content and assuring if it successfully meets the course learning outcomes. In our study, we compared the evaluation of the e-content from the students' and instructors' point of view. The students' evaluation for the quality of the offered e-content course was 1.98 out of 4 as a Very Low perceived factor due to the lack of proper instructional design. While the instructors' evaluations were 2.86 out of 4 as an Average perceived factor. This is inconsistent with the reported results in India (Hassan, Mirza, & Hussain, 2020), where a set of technical difficulties were occurred while creating the e-content.

Our results showed that the e-content attained the course learning outcomes with value 2.47 out of 4 as Low perceived factor from the students' perspective.

While it was 3.42 out of 4 as high perceived factor from the instructor point of view. This contradicts the fact that two-third of students did not face any problems in understanding the explained material. This is due to the fact that the previously prepared e-contents were designed to meet the blended-learning approach not a complete E-learning approach. All these results answer the first research question addressed previously in this paper.

Finally, it is a vital task to compare and investigate the E-learning education to the traditional education. A contradiction was found between the instructors' and the students' opinions. The students' evaluation was 2.08 out of 4 (Low factor), while the instructors' evaluation was 2.5 out of 4 (Average factor). The Pearson Coefficient test showed a strong positive relationship between comparing the E-learning education to the traditional education with a value 0.626 and 0.525 from students' and instructors' perspective respectively.

Self-evaluation of the E-learning experience was guided at the end of each learning unit. The students and instructors had a chance to quantify the learned material and to emerge the gained knowledge into a real-life practice. This self-evaluation allowed both instructors and students to appraise what they have taught/learned to reach a better conception of the learning subjects. Consequently, the students' evaluation for the self-evaluation was 2.30 out of 4 (Low factor) while the instructors' evaluation was 3.36 out of 4 (Average factor). Another contradiction was found in this manner which reflected the instructors'

acceptance and the students' refutation towards this type of learning. The Pearson Coefficient Test displayed a strong positive relationship between self-evaluation of the E-learning experience with a value 0.532 and 0.433 from students' and instructors' perspective respectively.

Moreover, Pearson Coefficient Test was accomplished to investigate the relationships between the set of criteria and the percentage of the quality of the E-learning evaluation. All experiments were fair, since each experiment chose one criterion out of the set of criteria shown in Table 1 as the independent variable to measure the percentage of the E-learning evaluation (dependent variable). There were statistically significant positive relationships between the predefined set of criteria and E-learning evaluation as percentage from students' and instructors' viewpoints. The values of the correlation coefficients were statistically significant at the level of significance less than (0.01) as shown in Table 1.

By comparing the students' responses with the instructors' responses on the set of the criteria, we unfortunately found that there were negative reverse relationships. The value of the statistic F-Test is either relatively low or high with statistical significance greater than 0.05. In both cases, it indicated a very weak relationship between instructors and students. This signposts a huge conflict between the students' and instructors' opinion. These results answer to the second research question addressed previously in this study.

The diversity of the students' and instructors' evaluations of the quality of E-learning process is a

Factors	Criteria	Correlation Coefficient	Students' Perspective	Instructors' Perspective
Technology Infrastructure	Availability of the high-speed internet	Pearson Correlation	0.423**	0.321**
		Sig. (2-tailed)	0.000	0.000
		N	16383**	382**
	Accessibility to different communication technologies	Pearson Correlation	0.489	0.362
		Sig. (2-tailed)	0.000	0.000
		N	16383	382
Virtual Classroom	Attending/running the virtual class	Pearson Correlation	0.401**	0.215**
		Sig. (2-tailed)	0.000	0.000
		N	16383	382
	Interaction between the students and their instructors	Pearson Correlation	0.409**	0.454**
		Sig. (2-tailed)	0.000	0.000
		N	16383	382
E-content	Quality of the e-content	Pearson Correlation	0.565**	0.535**
		Sig. (2-tailed)	0.000	0.000
		N	16383	382
	Full filling the course learning outcomes	Pearson Correlation	0.526**	0.431**
		Sig. (2-tailed)	0.000	0.000
		N	16383	382

Table 1 - The statistically significant relationships between the main factors and the percentage of practicing E-learning at HU.
** indicates a statistically significant p-value less than 0.01.

phenomenon that needs to be justified. The E-learning during the pandemic is considered as a successful experience from the instructors' perspective, while it is an immature experience from the students' perspective due to the following explanations:

1. Students did not understand the new role of the instructor as a guide or facilitator. Some students believed that the instructors were not teaching due to the new adapting format. Students requested instructor's emotional and intellectual support which unfortunately were not part of the E-learning process. This brings into line Hong Kong University students were also affected physically and emotionally during the pandemic, and teachers had to create an appropriate teaching and learning experience in view of the external environment and the students' internal emotional needs (Sum, 2021).

2. In Jordan, we have extremely large family size that is impossible to afford a technology device for each family member. In addition to that, all online sessions were running simultaneously from 8:00 am to 4:00 pm at school, colleges and universities. This generated a problem between the family members (UNDP , 2020).

3. Students have been raised on a face-to-face teaching approach since school time. They didn't get any chance to practice the E-learning process in any subject or part of subject before the pandemic. This drastically increased the pressure on adapting this new approach (Lemay, Bazelais, & Doleck, 2021).

4. Before the pandemic the culture of E-learning was not applied completely on any course in its correct definition because all the ready prepared e-content were used in a blended-learning approach. The methods of e-content deliverance are learning through doing, investigation, testing and evaluation. The educators became tech-savvy in the rise of the global technological teaching (Peter, 2021).

5. The learning process has two directions: one is related directly to receiving information from the instructor and the other one is related to working in groups. It is worth mentioning that the group discussion had not been activated during the virtual classes due to its large size. This consequently led to miss the cooperation between students, which decreases the quality of education (Powell & McGuigan, 2021) and (Sugino, 2021). Some instructors are running one VC for all sections of the same course. The number of students may exceed one hundred which accordingly affected the style of instructors' teaching. The spoon feeding will dominate the class, and the instructor-centered the learning approach. The instructor failed to generate a small, fixed size of students group to discuss the topic, and to work with them in solving a problem (Powell & McGuigan, 2021) and (Sugino, 2021).

5. Recommendations

There is an urgent need for HU to plan appropriate measures to protect students' and instructors' health to practice the actual definition of the E-learning in real life scenario, and simultaneously, improve the quality of the education. HU has to deploy a new tactic for education during the pandemic for the coming academic terms by disseminating the E-learning culture. Thus, a new educational era will start with a new strategy that includes students and instructors to guarantee the continuity of the education process. Some feasible suggested actions should be taken in response to the findings of our study:

1. Developing this new strategy is a tricky task due to the inapplicability of the E-learning during the pandemic. The E-learning in its current format is not accepted to be applied for the coming academic terms. The drawbacks of the E-learning experienced received from the students have to be incorporated to enhance the quality of the education and to satisfy the students' needs. Reshaping the E-learning process is a must action by establishing the virtual office hours, forcing the instructors to answer students' queries 24/7, changing the assessment plan to cover a homework per class, weekly quizzes and a well incremental structure project. Therefore, the workload for the instructors should be doubled or even tripled. Consequently, several graders have to be assigned to every instructor to support the E-learning process. The mark of the offered courses should not remain as pass/fail since this will affect the quality of the education. Therefore, a real mark has to be assigned.

2. Integrating the technology in education will increase the possibility of having sociological problems in students' life. Instructional monitoring and constant caring are highly required to reduce the complexity of using the technology among students. A policy of assigning a specific advisor for every single student is deployed to conduct a weekly meeting. This should be reflected as a part of the instructors' load.

3. No indicator when this pandemic will end, thus there is a high possibility for both instructors and students to be infected by COVID-19 during the coming semesters. Dealing with the student case is simple by extending the deadline of the submission date for quizzes or assignments and consider his/her absents as a legal excuse. On the other hand, a backup plan should be seriously adopted in the instructor case by assigning another expert instructor to cover his/her classes during the sickness period.

4. Instructors face much-challenged life started with on-line teaching and resume their research activities. One year should be added to the tenure clock due to the time they spent to be trained and

the effort they devoted to preparing the e-content. Moreover, their research activities had been suspended during this pandemic (Int@j, 2018). The Ministry of higher education in Jordan and particularly the deanship of scientific research at HU should take into consideration extending the deadline for all funded researches.

5. The higher education system must carefully look to the education in a new perspective. Providing different learning methodologies to support fairness and to guarantee the lifelong learning should be implemented in all universities. In addition, to identify new policies and regulations that support students to have a chance in choosing between the traditional learning approach and E-learning approach per course during the coming academic terms.

6. Conclusion

COVID-19 outbreak has deeply jammed the universities and schools globally and specifically in Jordan. Universities require many things to satisfy the students' needs and to reduce the instructors' concerns. In this paper, we used the statistical analysis to highlight the main factors in the E-learning process and to utilize them to improve the education process currently. Our results showed that HU has successfully integrated E-learning in the educational process. It is not only important to adapt E-learning as a response to this pandemic, but also making the higher education more reachable and available for everyone in the future. Some recommendations were highlighted in this study to help the decision makers at HU, and the other universities in Jordan, to overcome this crisis.

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