International Journal of Web-Based Learning and Teaching Technologies
Volume 16 • Issue 5 • September-October 2021

Student Perspective-Based Evaluation of Online Transition During the COVID-19 Outbreak:
A Case Study of PNU Students

Fahima Hajjej, Information Systems Department, College of Computer and Information Sciences, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia

https://orcid.org/0000-0002-9469-1759

Sarra Ayouni, Information Systems Department, College of Computer and Information Sciences, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia

https://orcid.org/0000-0002-4019-380X

Hadil Shaiba, Computer Sciences Department, College of Computer and Information Sciences, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia

Ala Saleh Alluhaidan, Information Systems Department, College of Computer and Information Sciences, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia

https://orcid.org/0000-0001-6829-9705

ABSTRACT

Due to the COVID-19 pandemic, many higher education institutes shifted to online learning with the precautionary measures taken by governments. This transition was very rapid and sudden, which brought challenges to all learning methods in all disciplines while opening up new opportunities. Different studies have been carried out to evaluate experiences of online migration and study its effect on stakeholders in education. This paper is aimed to rationally evaluate the transition to online learning in PNU from the student perspective. Five thousand ten student responses to an online survey were collected. The survey results indicate that the majority of students were satisfied by the quality of the delivered courses during this crisis period as they have received adequate support from instructors, IT, and leaders. Moreover, student satisfaction can be explained by the readiness and preparedness of PNU for such circumstances. Indeed, students and instructors are poised to adopt new learning modalities as they were familiar with new technologies and innovation in learning and teaching so far.

KEYWORDS

COVID-19, Large Survey, Online Transition, Student Perspective

INTRODUCTION

The spread of the coronavirus disease 2019 (COVID-19) is predominantly affecting public health. However, it has yet deleterious effects on many other sectors such as economy, society as well as education. Significant disruption of education provision is caused by the mandated lockdown and the confinement measures taken by governments to reduce the spread of the virus. Millions of students

DOI: 10.4018/IJWLTT.20210901.oa2

This article, published as an Open Access article on July 9th, 2021 in the gold Open Access journal, the International Journal of Web-Based Learning and Teaching Technologies (converted to gold Open Access January 1st, 2021), is distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/) which permits unrestricted use, distribution, and production in any medium, provided the author of the original work and original publication source are properly credited.

around the world were cut off from on-campus learning and most educational institutions were urged to adapt and shift from traditional to fully online learning. In such a way, students were provided with the required course content and number of class hours through online learning. The perception of this global astonishing shift to online education differs from country to country and from university to university. Indeed, there is little consensus on the success of such a change as some studies estimate online learning to be efficient and some presume its failure to replace face-to- face learning. Many institutions which were reluctant to change are compelled to accept modern technology, others are already prepared to such a massive change.

In Saudi Arabia, almost all universities have made great strides in implementing robust infrastructure for deploying online learning during the last decade (Al-Asmari & Rabb Khan, 2014). During the pandemic these universities have proved their adaptation and resilience facing such crisis. Princess Nourah University (PNU) was one of the leading universities in KSA that has adopted fully online transition of teaching and learning. In PNU there are 15 colleges and institutes including about 38.000 students.

The premises of the PNU like all other university in the KSA, have been closed in early March as part of the government's efforts to contain the spread of the virus. Shifting to online education was implemented promptly through various technical platforms and systems. For the examination and the remaining evaluation part of the semester, the universities were left to implement whatever decision they deemed best in assessing students. PNU has decided to handle exams and evaluation in fully online settings.

Several studies were conducted to report and evaluate the online shifting experience in universities during the coronavirus pandemic (Almaiah, Al-Khasawneh, & Althunibat, 2020) (Ashokka, et al., 2020) (Berezhna & Prokopenko, 2020) (Johnson, Veletsianos, & Seaman, 2020) (Moawad, 2020) (Schneider & Council, 2020) (Telles-Langdon, 2020) (Watermeyer, Crick, Knight, & Goodall, 2020).

This article is aimed to rationally evaluate the transition to online learning in PNU from students' perspective. To this end we propose to examine the most favored dimension to consider for evaluating PNU's online transition experience through analyzing an online survey shared with students. The online survey was created by the Deanship of Quality Assurance and Accreditation of the university.

In the next parts of the paper, we are going to start by presenting some universities' experiences with online transition. Afterward we present our methodology and we report the different findings resulted from the survey analysis.

UNIVERSITIES' EXPERIENCES WITH ONLINE TRANSITION DURING COVID-19 CRISIS

Different studies (Ali, 2020) (Almaiah, Al-Khasawneh, & Althunibat, 2020) (Ashokka, et al., 2020) (Bao, 2020) (Bao, 2020) (Berezhna & Prokopenko, 2020) (Abbasi, Ayoob, Malik, & Memon, S. I, 2020) (Hiij, et al., 2020) (Watermeyer, Crick, Knight, & Goodall, 2020) (Telles-Langdon, 2020) have been carried out to evaluate experiences of online migration and study its effect on stakeholders in education (i.e. faculty, administrators and students). In what follows we review some of these studies.

Many reseaches study the effect of the transition on students and faculty members. A study focused on the effect of COVID-19 on UK academics was conducted by (Watermeyer, Crick, Knight, & Goodall, 2020). It criticizes the educational systems and claims that they are not ready for digital transformation and urges the need for change. In the study of (Johnson, Veletsianos, & Seaman, 2020), authors focus to study the effect of the fast shift to online learning during the beginning of COVID-19 on faculty members and administrators. It mentioned the positive effect of this transition on students and faculty members as it provided support to those who were affected by those events. In the study of (Moawad, 2020), the author analyzes the College of Education students' most concerns and fears during the first week of the lockdown at King Saud University (KSU). The author mentioned the importance of students trusting the online environment, the faculties engaging with students and

vice versa, and the students and faculties knowing how to work with the platform and understand its functionalities. Another questionnaire conducted by (Berezhna & Prokopenko, 2020) addressed the difficulties students across Ukraine's universities are facing during the online learning transition. The issues addressed were the lack of technical preparations in some institutions, mental issues faced by students which included missing some classes, needing more real time online streaming and live interaction with faculty members, the rise in the amount of assessments and the lack of time to complete them, laptops and limited internet accessibility. The study also showed that some disciplines had an easier transition than others. In the study of (Ashokka, et al., 2020), the authors investigate the challenges of the emergency learning transformation occurring due to COVID-19 outbreak in some medical disciplines which require hands-on experience and face-to-face training. Indeed, the effect of the responses to the pandemic in a Singapore medical center was studied. To mitigate the effects, the authors suggested modeling a timely response plan that includes reducing the interaction between students and groups and isolate cohorts from each other, reschedule the academic calendar and shift assessments or modify them. Being transparent about the number of reported and severe cases in the institution, can help decision makers make the right decisions. It is also suggested that the decisions made by the stakeholders should be based on scientific evidence and experts. The paper mentions different challenges with fully online transition which included lack of tools and resources especially for training purposes, issues such as internet connection, disparity between students' engagement, and fake identities logging into the system.

Some studies, instead of concentrating on challenges, listed a set of online resources that can help learners advance their knowledge during those challenging times. One example is a research done by (Schneider & Council, 2020) which help dermatologists get the best online training resources and help them shift from traditional one-to-one learning to remote learning. The study mentioned that Cook and Dupras (Cook & Dupras, 2004) described in their article the best practices for a successful online delivery of training directed to medical students. They recommended using a user-friendly platform that is well maintained and including a self-assessment tool to ensure that students are following up and engaging with the delivered material. In the study of (Almaiah, Al-Khasawneh, & Althunibat, 2020), 30 students from a Saudi university and 31 experts from several Jordanian universities and the Ministry of Higher Educations participated in a survey done to analyze the challenges and factors of successful delivery of distance learning during the pandemic. Among the participants were students, IT experts, policymakers, and faculties from Information Systems disciplines. The results showed that the first issue is the resistance to change by students and faculties. The second concern is technical issues with the platform and the need for a platform that is easy to use, has a friendly interface and usable. The budget dedicated for e-learning was another issue raised by participants as the success of such a platform requires financial assistant. Providing faculties with the best methods of teaching during this rapid shift is a concern for many academics. A case study of the experience of a faculty member was described in the research of (Telles-Langdon, 2020). The author mentioned that the transition has stressed not only students and faculties but also staff providing technical support and services to students and others who are holding different roles in the university.

The global COVID-19 pandemic has forced educational institutions to shift to online education. This crisis situation presents a set of serious challenges and opportunities. A few research studies have explored these challenges and opportunities associated with online learning during the Corona Crisis situaion. Many researchers are trying to explore the advantages, disadvantages and challenges of recent online learning initiatives from the perspective of faculties and students.Some other studies addressed these challeges and opportunities from administrato's perspectives. Future research should investigate students' opinions regarding online learning to examine the challenges faced by students. More research is needed to explore the challenges of utilizing e-learning that hinders students from achieving their learning goals. In this research, we suggest studying the quality of online learning from the student perspective.

DIMENSIONS INFLUENCING STUDENT PERCEPTION TOWARDS ONLINE TRANSITION

Some Statistics About PNU Transition to Online Learning

According to the preventive measures and directives taken by the Saudi Ministry of Education to contain the virus, face-to-face education was suspended in all schools and universities in the Kingdom of Saudi Arabia on the 8th of march 2020 and replaced by online learning to ensure the continuity of the educational process remotely. In PNU, the department of electronic learning endeavored to support students and faculty into online transition and made it as smooth as possible. All the issues related to the IT or the learning management system faced by instructors or students are reported to the team of the department through the electronic units in each college of the university. The department of electronic learning has created different communication channels (e.g. emails, WhatsApp groups, telegram groups and forums) to answer all questions and solve any problems faced by students and faculties.

In PNU and prior to COVID-19, both academics and students had existing experience with these technologies that they were able to expand. Indeed, all faculty members are required to design their courses on the blackboard according to the QM standards. In the other hand, all students have two fully-online courses named "Arab 202" and "Salam 101" to complete by the second semester of their studies. So, students and academics are not starting from scratch with these technologies, which facilitated the smooth transition into the online learning during the pandemic, although it was sudden.

The continuity of the educational processes (i.e. classes, assessments, examination, etc.) was assured by faculty over seven weeks using different tools and platforms (e.g. Zoom, Microsoft team, Blackboard, etc.). Figure 1 shows the number of synchronous sessions delivered within the lockdown period (i.e. seven weeks). The faculty member was given the choice to deliver the lectures synchronously or asynchronously. We can observe from Figure 1 that synchronous lectures start decreasing in week 6 and 7. These two weeks are dedicated to final labs and project's discussion. During the first 5 weeks, the majority of faculty members choose to deliver their lectures synchronously.

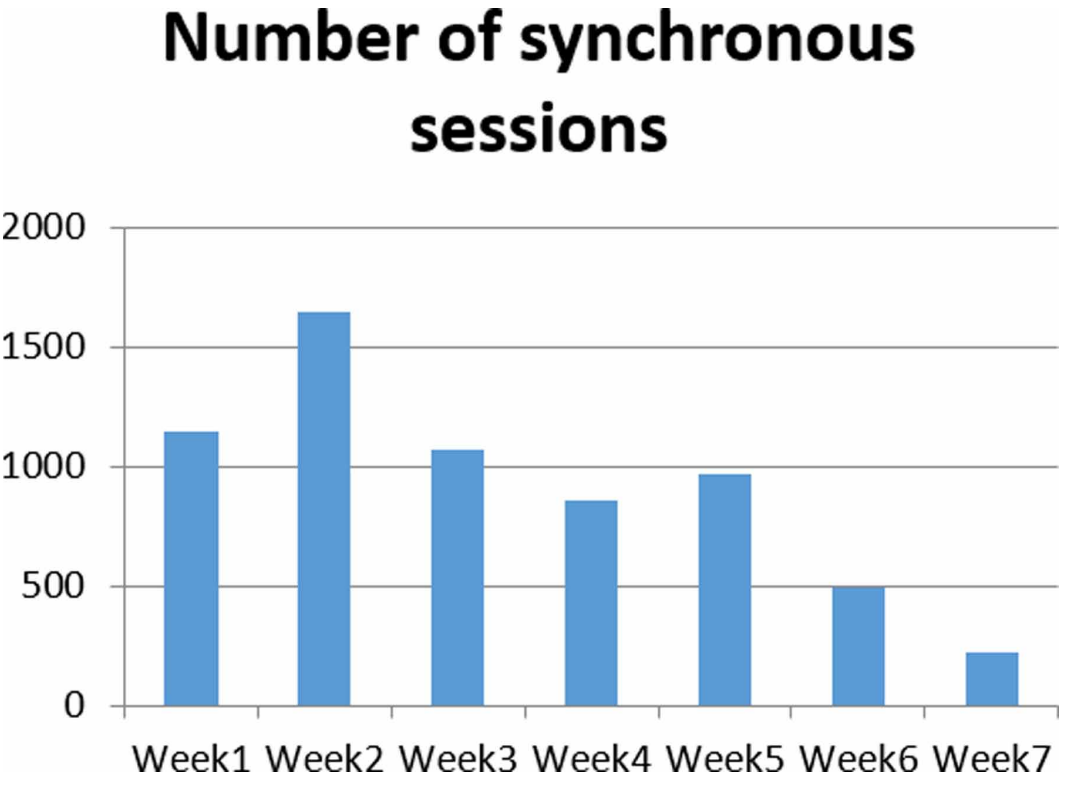
All University examinations except clinical ones were scheduled using an online delivery method. Clinical examinations were postponed to the next semester. The department of electronic learning has created an examination policy for both students and academics. All students were required to ensure that they have read and fully comply with their corresponding policy before starting an online exam. All faculty members were required to respect the policies related to how to design an exam online (i.e. the duration, type and number of exam questions, exam models, etc.). Indeed, the exam should be designed on the Blackboard using question pools from which a random selection of questions is presented each time a student takes an exam. The number of exams taken within the period of three weeks are depicted in Figure 2.

Dimensions to Consider in Evaluating PNU Student Experience From Students' Perspective

Many researchers focused to describe the critical factors influencing learner satisfaction in an online learning environment (e.g., (Liaw & Huang, 2013), (Weidlich & Bastiaens, 2018), (Dziuban C. M., 2015)). Others explore the factors underlying the success or failure of online learning (e.g., (Bolliger & Halupa, 2018); (Shelton, Hung, & Lowenthal, 2017); (Yang, Baldwin, & Snelson, 2017)). Some other studies (e.g., (Moore, 2014); (Kuo, Walker, Belland, & Schroder, 2013); (Dziuban C. M., 2015))) were conducted to evaluate online learning experience based on several dimensions and factors.

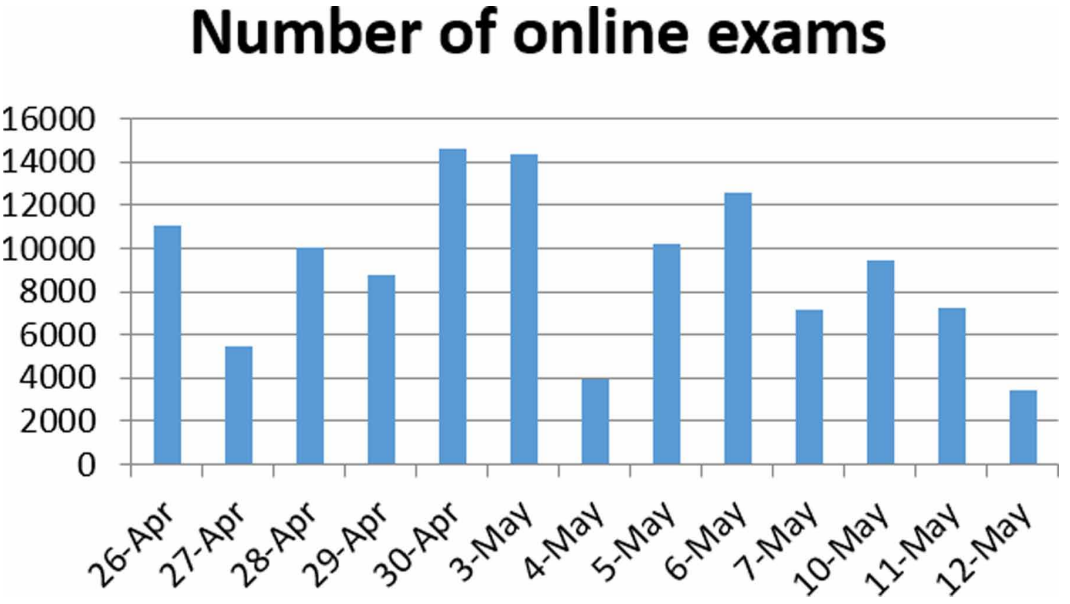
Ke and Kwak (Ke & Kwak, 2013) determined five factors of student satisfaction: "learner relevance, active learning, authentic learning, learner autonomy, and technology competence". Kuo et al. (Kuo, Walker, Belland, & Schroder, 2013) identified three indicators of students' positive perceptions towards online learning: ''learner-instructor interaction and learner-content interaction combined with technology efficacy''. Moore (Moore, 2014) examined success, failure, withdrawal,

Figure 1. Synchronous sessions delivered in PNU during Covid-19 lockdown



and satisfaction of students in online public courses. He found that strongest predictors of success

Figure 2. Performed exams in PNU during Covid-19 lockdown



and satisfaction are student–student interaction and self-discipline.

The authors (Keengwe, Schnellert, & Mills, 2012) declared that effective technology tools in online learning are the key to understand student satisfaction. The authors concluded that satisfaction was most impacted by the effectiveness of e-learning tools combined with learning convenience. Martin and Parker (Martin & Parker, 2014) identified the reason behind adopting synchronous virtual classrooms and how it is used. They determined that resource and technology availability along with increasing social presence and the aim to enhance student learning are the reasons behind adaptation to this type of teaching method. Nwankwo (Nwankwo, 2015) conducted a study regarding faculty perceptions of online learning. Nwanko's findings indicated instructor interface and instructor learning interaction were the most critical elements. The author identified six dimensions to online learning: (a) instructor interface, (b) learner–learner interaction, (c) course structure, (d) instructor–learner interaction, (e) learner autonomy, and (f) higher learner expectation.

The authors (Shackelford & Maxwell, 2012) listed types of interaction especially the ones that contribute most to students' sense of community (SoC) within the context of online graduate courses. The results indicate that the interactions that are most predictive of SoC include instructor modeling, support, and encouragement, facilitating discussions, multiple communication modes, and required participation. A study by (Sher, 2009) explores the importance of student interaction in online learning programs. It found that student-instructor and student-student interactions were substantial contributors to student learning and satisfaction. In their study, Gamage et al (Gamage, Perera, & Fernando, 2015) propose a framework to measure effectiveness of online learning. A proposed framework is constructed using 10-dimensional effectiveness.Those dimensions are: "interactivity, pedagogy, collaboration, usability, network of opportunity, motivation, technology, content, support for learner and assessment''. Noesgaard and Ørngreen (Noesgaard & Ørngreen, R, 2015) considered that the effectiveness of e-Learning is by conducting an integrative review. Looking for the definition of effectiveness for e-Learning, authors define effectiveness on linking it to 'learning outcome' measurement were mostly include quantitative approach with pre-and post-tests. Additionally, they found that self-assessments can be a reliable source of data. A framework of effectiveness is suggested that includes factors cover: "the context in which the e-Learning solution is used, the artifact (the e-Learning solution itself) and the individuals that use the artifact''. To measure the motivation of students in an online course, Selvi (Selvi, 2010) develops a framework based on the following factors "learning-teaching process, competencies of instructors, participants' attention, online learning environment/technical infrastructure and time management".

METHODOLOGY

The main purpose of this study is to determine students' perception towards online learning during the lock down. The research is based on the results of a survey organized at PNU (public women's university). When composing this survey, we formulated five basic hypotheses which are to approve or disprove, which are stated as follows:

- **H1**: Student's satisfaction levels vary by field of study.
- **H2**: Student's satisfaction levels vary by practical orientation of the courses.
- **H3**: teaching methods, strategies and e-learning tools diversity have positive effect on student acquiring new skills and competences during online transition.
- **H4**: Student development and support: Instructor commitment and support has positive effect on students' outcomes in switching from face-to-face to fully online learning.
- **H5**: Building the competitive capabilities of PNU university: Issues related to the online systems and the IT support are not considered in PNU.

Table 1. Number of Participants/Type of College and sections

	Colleges	
	Humanities	**Sciences**
Number of colleges	5	10
Number of sections/colleges	73	94
Number of students/colleges	2190	2820

Sample

The survey was carried out on students from all colleges of PNU in KSA. Table 1 illustrates the total number of respondents which is 5010 students that belong to colleges of humanities and sciences.

Data Collection Method

A total of 5010 female students responded to the survey after finishing the online courses and after entering the after exams. This online survey was created by the Deanship of Quality Assurance and Accreditation of the university. It includes a set of questions about the learning effectiveness through e-learning during coronavirus pandemic and student's satisfaction level. The survey was designed based on 5-point Likert scale on a continuum from strongly disagree to strongly agree as shown in Table 2. This was pre-tested on a group of students from all PNU colleges for standardization before the administration of the survey. After the final exams, the Deanship of Quality Assurance and Accreditation shared the link of the survey with all students. The students are requested to fill out the survey made available on the PNU portal. The data was collected over three weeks (May 2020). The survey takes about four minutes to complete. For this study, a request to the Deanship of Quality Assurance and Accreditation was made in order to get the results of the survey. We were provided by a set of random and anonymous responses of the survey from different colleges.

The survey consists of 22 questions divided into five dimensions: 1- Planning, preparation and organization 2- Learning and teaching environment 3- Instructional and technological adequacy of the teacher 4- Learning resources and feedback 5- E-learning environment and IT support. Each dimension has different number of questions. The last item of the survey which is Q22 is about general evaluation of the course. To analyze the survey data, we used the SPSS software version 20 (SPSS, 2020). The software was chosen for its excellent reliability among multiple measures of variables of the study.

The Reliability of the Instruments

The survey consisted of 22 items. Table 3 shows the value of the Cronbach's Alpha. As mentioned in Table 3, the overall Cronbach's Alpha reliability is 0.992. Alpha value is high and shows that the instrument yielded consistency since reliability is accepted when the Crobach's Alpha is greater than 0.70. The alpha coefficient suggests that the items have relatively high internal consistency and hence all items of the survey will be retained.

Table 2. Score of each point of the Likert scale

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
5	4	3	3	1

Table 3. Reliability Statistics

Cronbach's Alpha	N of Items
.992	22

Data Analysis

In this section, the results of the research are discussed in detail based on students' responses to the online survey that were provided by the Deanship of Quality Assurance and Accreditation in PNU. As mentioned earlier, the purpose of the study is to investigate the student's satisfaction and perception towards online learning during COVID-19 lockdown. Thus, according to the values in Table 4, the average scores of the majority of factors are even greater than 4 on a 5-point scale which means that the majority of students expressed good satisfaction towards online learning. Unlike several studies which have found that students have negative perception towards e-learning [(Abbasi, Ayoob, Malik, & Memon, S. I, 2020); (Ali, 2020)], 81% of PNU students have positive perception.

As shown in Table 4, switching from face-to-face to fully online learning process was not surprising nor chocking for students that have expressed positive perception about course planning, implementation and organization (i.e.; Dimension 1 of the survey) with a mean value of 4.2426. Also, the instructional and technological adequacy of faculty members (i.e.; Dimension 2 and 3) and the use of various tools in the online environment have been evaluated positively with respectively mean values of 4.1845 and 4.1065. This can be explained by the fact that all faculty members in PNU have previously experienced online environment (through using the Learning Management System (LMS)) and used it to communicate with students and deliver their course content. So, faculty members seem to already have enough technological skills to swap to the new settings.

From the reported results, we can conclude that students have received feedback on their progress in the course, the resources they need and prompt responses to their answers about the course (i.e. dimension 4). In another hand, the promptness of response from the IT team and the quality of the technological setting were judged quite good (i.e. dimension 5), with a mean value of 4.12723. All things considered, PNU students' experience with the online transition can be judged quite good. This can be confirmed by the results related to question Q22 ("I generally feel satisfied with the quality of the course on distance"), that reveal that students' satisfaction overall level towards online transition is relatively high with a mean value of 3.9.

This can be explained by the prior acquaintance to online learning environment of both PNU students and faculty members. Before the pandemic and for many years, the department of online learning has strived to integrate the LMS into the teaching and learning processes. For example, as mentioned previously, in level 1 and 2 of each curriculum in the university, all students take two fully online common courses, besides, they have many blended ones. These findings show that the higher and the earlier adoption of the online learning environment (i.e. through an LMS) the smoother and more successful the online transition during an outbreak will become.

H1: Student's Satisfaction Levels Vary by Field of Study

In the university there are 15 colleges classified into 9 colleges of Sciences and 6 colleges of Humanities. From Table 5, the reader may observe that students from Humanities' discipline are more satisfied than those from Science over the five dimensions. This observation is outstanding, especially for the fourth dimension (i.e. Learning resources and feedback) with a mean value of 3.99554 for sciences and 4.20129 for humanities' disciplines. This is likewise confirmed by results of Q22 where students from sciences are less comfortable with online transition than those from humanities disciplines with mean values of respectively 3.8675 and 4.0842. H1 is supported.

Table 4. Student satisfaction/Dimension

		Mean	Std. Deviation
Dimension1: Planning, implementation and organization		**4.24257**	**0.41144**
Q1	I was provided with the course plan and all its requirements from the beginning of the semester.	4.2917	0.38122
Q2	The remaining topics of the course plan has been appropriately completed online during the lockdown.	4.2254	0.43196
Q3	The course material was presented in a flexible and coherent manner, according to the needs of the students and the technical capacities at their disposal.	4.2106	0.42115
Dimension 2: Learning and teaching environment		**4.10650**	**0.43799**
Q4	Online teaching and learning methods have been diversified according to the course objectives.	4.109	0.44324
Q5	Various electronic tools have been employed to suit the nature of the course content	4.1501	0.42216
Q6	Online teaching and learning activities helped me to acquire new skills and information.	4.0604	0.44856
Dimension3: Instructional and technological adequacy of the teacher		**4.17230**	**0.46490**
Q7	The faculty member was keen to announce and notify the course news and events clearly.	4.223	0.48281
Q8	The faculty member complied with the pre-scheduled dates of online lectures.	4.2099	0.43584
Q9	The faculty member has succeeded to manage various learning activities in the virtual learning environment.	4.1206	0.48414
Q10	The faculty member was able to present the course using the appropriate electronic methods.	4.1667	0.44756
Q11	Various communication tools and support were provided to meet my needs accordingly with emergency updates.	4.1413	0.47415
Dimension4: Learning resources and feedback		**4.09460**	**0.47196**
Q12	The evaluation tools announced in the course were clear to me during the distance learning.	4.1518	0.45444
Q13	I was provided with the necessary instructions on electronic homework and tests in a way that helped me accomplish what was required	4.1147	0.47909
Q14	The grades were distributed appropriately to the electronic assessment mechanisms provided as an alternative to the traditional methods.	4.0064	0.53158
Q15	The faculty member was keen to provide me with directions and notes on my academic progress.	4.041	0.51938
Q16	I was provided by a timely responses to my questions about the course and its requirements.	4.0686	0.50985
Q17	The references and teaching material linked to the course stood out for their novelty.	4.1316	0.40905
Q18	Various learning resources were used through the electronic environment.	4.1481	0.40034
Dimension5: E-learning environment and IT support		**4.12723**	**0.36814**
Q19	Ease of use of the e-learning system tools applied in the course.	4.174	0.37547
Q20	The e-learning system tools were used effectively in a way that helps me in achieving the course outcomes.	4.1526	0.38404
Q21	Rapid response of the IT support team to meet my needs and solve technical problems through various communication channels.	4.0551	0.34491
Q22	I generally feel satisfied with the quality of the course on distance.	**3.9719**	**0.55073**

Table 5. Student satisfaction/Discipline

	Discipline					
	Sciences		Humanities		Total	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Dimension1	**4.16440**	**0.44386**	**4.32673**	**0.35649**	**4.24257**	**0.41144**
Q1	4.2332	0.39705	4.3547	0.35521	4.2917	0.38122
Q2	4.1375	0.47377	4.3201	0.36149	4.2254	0.43196
Q3	4.1225	0.46077	4.3054	0.35277	4.2106	0.42115
Dimension2	**4.00713**	**0.48470**	**4.21350**	**0.35317**	**4.10650**	**0.43799**
Q4	4.0127	0.4946	4.2126	0.35515	4.109	0.44324
Q5	4.0419	0.47831	4.2667	0.31543	4.1501	0.42216
Q6	3.9668	0.48119	4.1612	0.38893	4.0604	0.44856
Dimension3	**4.05611**	**0.51350**	**4.26830**	**0.37745**	**4.15827**	**0.46441**
Q7	4.1094	0.53897	4.3454	0.38083	4.223	0.48281
Q8	4.1168	0.48932	4.3101	0.34564	4.2099	0.43584
Q9	4.006	0.51817	4.2441	0.41338	4.1206	0.48414
Q10	4.0675	0.49129	4.2735	0.3693	4.1667	0.44756
Q11	4.0242	0.51557	4.2674	0.39046	4.1413	0.47415
Dimension4	**3.99554**	**0.52269**	**4.20129**	**0.38468**	**4.09460**	**0.47196**
Q12	4.0733	0.5185	4.2363	0.35786	4.1518	0.45444
Q13	4.0185	0.52373	4.2183	0.40407	4.1147	0.47909
Q14	3.9142	0.56493	4.1056	0.47706	4.0064	0.53158
Q15	3.9105	0.57048	4.1815	0.41789	4.041	0.51938
Q16	3.9437	0.56752	4.2032	0.40121	4.0686	0.50985
Q17	4.0535	0.46244	4.2158	0.3248	4.1316	0.40905
Q18	4.0551	0.45124	4.2483	0.30989	4.1481	0.40034
Dimension5	**4.00953**	**0.44524**	**4.17328**	**0.36009**	**4.08840**	**0.41379**
Q19	4.0912	0.41241	4.2631	0.30971	4.174	0.37547
Q20	4.0718	0.41409	4.2396	0.32978	4.1526	0.38404
Q21	4.0076	0.36338	4.1062	0.31828	4.0551	0.34491
Q22	**3.8675**	0.59109	**4.0842**	0.4826	**3.9719**	0.55073

H2: Student's Satisfaction Levels Vary by Practical Orientation of the Courses

Table 6 represents the mean values of the survey items according to the level of practical orientation of the courses delivered online. Practical orientation of the course can be high, medium or low according to its specification. As shown in this table, students' satisfaction is decreasing as far as the level of practical orientation is increasing. This observation is confirmed by the results of the item Q22, where the related mean values of students' satisfaction about Low, Medium and High practical orientation level of the course are respectively 4.0685, 3.9658 and 3.8511. It can be observed that

Table 6. Student satisfaction/Course Practical Orientation

	Practical Orientation							
	Low		Medium		High		Total	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Dimension1	**4.32673**	**0.35393**	**4.22307**	**0.35698**	**4.14677**	**0.48960**	**4.24257**	**0.41144**
Q1	4.3551	0.35505	4.2714	0.33477	4.2233	0.43234	4.2917	0.38122
Q2	4.3189	0.35813	4.2092	0.37106	4.1155	0.52615	4.2254	0.43196
Q3	4.3062	0.34861	4.1886	0.3651	4.1015	0.51032	4.2106	0.42115
Dimension2	**4.21613**	**0.35427**	**4.08557**	**0.42525**	**3.97867**	**0.50742**	**4.10650**	**0.43799**
Q4	4.2154	0.35301	4.1056	0.41608	3.9738	0.52775	4.109	0.44324
Q5	4.2737	0.31427	4.1019	0.41417	4.0222	0.50385	4.1501	0.42216
Q6	4.1593	0.39553	4.0492	0.44551	3.94	0.49065	4.0604	0.44856
Dimension3	**4.28592**	**0.38523**	**4.09368**	**0.49728**	**4.07706**	**0.50834**	**4.17230**	**0.46490**
Q7	4.3476	0.38506	4.0839	0.58345	4.1533	0.49386	4.223	0.48281
Q8	4.3059	0.35099	4.1203	0.48944	4.1445	0.47913	4.2099	0.43584
Q9	4.2397	0.4209	4.0733	0.4831	3.9978	0.53143	4.1206	0.48414
Q10	4.2732	0.37452	4.1253	0.43117	4.0562	0.51613	4.1667	0.44756
Q11	4.2632	0.39466	4.0656	0.49923	4.0335	0.52117	4.1413	0.47415
Dimension4	**4.19794**	**0.38977**	**4.03164**	**0.52455**	**4.00239**	**0.51011**	**4.09460**	**0.47196**
Q12	4.2348	0.36189	4.1047	0.52167	4.0755	0.50308	4.1518	0.45444
Q13	4.2156	0.40884	4.0625	0.52606	4.0185	0.51348	4.1147	0.47909
Q14	4.091	0.48651	3.9869	0.51748	3.9098	0.58563	4.0064	0.53158
Q15	4.1769	0.42172	3.9344	0.62696	3.9353	0.52509	4.041	0.51938
Q16	4.1993	0.40385	3.95	0.6217	3.9776	0.52231	4.0686	0.50985
Q17	4.2194	0.33077	4.0833	0.44636	4.0498	0.45759	4.1316	0.40905
Q18	4.2486	0.31483	4.0997	0.41164	4.0502	0.46361	4.1481	0.40034
Dimension5	**4.20060**	**0.32789**	**4.13010**	**0.33536**	**4.03060**	**0.41714**	**4.12723**	**0.36814**
Q19	4.262	0.31693	4.1667	0.33822	4.0651	0.4401	4.174	0.37547
Q20	4.2392	0.33804	4.1436	0.34775	4.0467	0.43806	4.1526	0.38404
Q21	4.1006	0.32871	4.08	0.3201	3.98	0.37327	4.0551	0.34491
Q22	**4.0685**	**0.49065**	**3.9658**	**0.6379**	**3.8511**	**0.54896**	**3.9719**	**0.55073**

students having a high practical level in the course plan are less satisfied than those having Low practical orientation courses.

Going more into details, Table 7 shows the results of nine randomly selected sections with different practical orientation levels. It can be observed from the data in this table that the mean values of sections with high practical orientation level over all the five dimensions are even lower than the other sections with medium and Low practical orientation level. H2 is supported.

This observation is consistent with results of many other studies [(Ali, 2020), (Bao, 2020), (Hiij, et al., 2020)] in many other countries (e.g.; China, Malaysia, Singapore, etc.)

Table 7. Samples of sections with different practical orientation level

Sec 9	Sec 8	Sec 7	Sec 6	Sec 5	Sec 4	Sec 3	Sec2	Sec 1	
Low	**Low**	**Low**	**Medium**	**Medium**	**Medium**	**High**	**High**	**High**	**Practical orientation**
									Dimension1
4.18	4.74	4.6	4.19	4.11	3.73	4	3.84	4.05	**Q1**
4.24	4.78	4.5	4.07	4.11	3.64	3.75	3.64	3.91	**Q2**
4.47	4.74	4.5	4.15	4.04	3.77	4	3.70	3.82	**Q3**
									Dimension2
4.53	4.62	4.3	3.96	3.82	3.5	3.75	3.48	3.77	**Q4**
4.41	4.64	4.5	3.96	3.86	3.59	3.75	3.64	3.86	**Q5**
4.41	4.58	4.5	3.93	3.89	3.64	3.25	3.5	3.68	**Q6**
									Dimension3
4.53	4.7	4.4	3.74	4.32	3.95	2	3.36	3.64	**Q7**
4.41	4.68	4.3	4.11	4.07	3.82	3	3.32	4.41	**Q8**
4.41	4.66	4.2	4.04	4.04	3.77	3	3.27	3.59	**Q9**
4.41	4.78	4.3	4.07	3.96	3.77	3.75	3.41	3.86	**Q10**
4.53	4.76	4.3	3.93	4.11	3.59	2.75	3.43	3.86	**Q11**
4.35	4.72	4.6	3.96	4.04	3.55	2	3.43	3.77	**Q12**
									Dimension4
4.35	4.76	4.5	4.04	4.11	3.68	2	3.48	3.68	**Q13**
4.12	4.76	4.3	3.89	4.21	3.5	2.5	3.48	3.59	**Q14**
4.29	4.6	4.2	3.85	4.25	3.77	1.75	3.18	3.5	**Q15**
4.47	4.64	4.3	3.70	4.25	3.59	1.75	3.30	3.68	**Q16**
4.47	4.68	4.4	3.96	3.96	3.5	4	3.57	3.64	**Q17**
4.29	4.7	4.3	3.96	4.11	3.64	3.75	3.57	4	**Q18**
									Dimension5
4.29	4.7	4.6	4	4.07	3.64	3.75	3.66	3.82	**Q19**
4.35	4.64	4.5	3.93	4.18	3.45	3.5	3.66	3.91	**Q20**
4.12	4.44	4.4	3.93	4.14	3.73	3.75	3.5	3.77	**Q21**
3.82	4.62	4.6	3.67	4.07	3.41	1.75	3.48	3.55	**Q22**

a. Effect of online Learning and teaching methods on student acquisition of new skills

In this subsection we are trying to prove or disapprove our hypothesis H3, that is the following.

H3: Teaching Methods and E-Learning Tools Diversity Have Positive Effect on Student Acquiring New Skills and Competences

To do so, we focus on the second dimension of the survey related to the learning and teaching environment. As it can be seen in Table 8, the survey items Q4 ("Online teaching and learning methods have been diversified according to the course objectives.") and Q5 ("Various electronic tools

Table 8. Pearson correlation between Q4, Q5 and Q6

		Q6
Q4	Pearson Correlation	.934**
	Sig. (2-tailed)	.001
	N	162
Q5	Pearson Correlation	.935**
	Sig. (2-tailed)	.001
	N	162

**. Correlation is significant at the 0.01 level (2-tailed).

have been employed to suit the nature of the course content.") have a statistically significant linear relationship ($p < .001$) with Q6 ("E-learning and teaching activities contributed to my acquisition of new skills and information"). Furthermore, the direction of the relationship is positive (i.e. Q4, Q5 and Q6 are positively correlated), which means that these variables tend to increase together. Thus, the hypothesis H3 is supported.

In this analysis, many teaching methods and e-learning tools are used in online learning. It encompasses a holistic view, interdisciplinarity, and working with different methods, where students can acquire new knowledge and skills. In order to facilitate supportive and corrective feedback, interaction proves important for both instructors and students and instructors can design highly interactive settings.

b. Effects of instructor commitment and support on student outcomes

In what follows we are trying to approve or disapprove our second hypothesis H2, that is:

H4: Instructor Commitment and Support Have Positive Effect on Student Outcomes

In the literature, instructor commitment has been recognized as an important predictor of school success [Fink, 1992]. Instructor commitment and support represents their devotion to their students' behavior and learning [Dannetta, 2002; Elliott & Crosswell, 2002; Nias, 1981). It includes instructor willingness and dedication to support students in their learning through the following:

1. how course content is designed and delivered to students on the e-learning environment (item Q3 of the survey),
2. to which extent online teaching and learning methods have been diversified according to the course objectives (item Q4 of the survey),
3. Does the instructor respect the pre-scheduled dates of online lectures (item Q8 of the survey)
4. Does the instructor provide students with timely responses and a feedback about the course and its requirements (item Q16 of the survey).

In this study, we argue that the instructors' commitment and support to their students effect the achievement of student outcomes (item Q20 of the survey).

As mentioned in Table 9, the survey items Q3 ("The course material was presented in a flexible and coherent manner, according to the needs of the students and the technical capacities at their disposal. "), Q4 ("Online teaching and learning methods have been diversified according to the course objectives."), Q8 ("The faculty member complied with the pre-scheduled dates of online lectures. ") and Q16 ("I was provided by a timely responses to my questions about the course and

Table 9. Correlations between survey items Q3, Q4, Q8, Q16 and Q20

		Q20
Q3	Pearson Correlation	.963**
	Sig. (2-tailed)	.001
	N	162
Q4	Pearson Correlation	.959**
	Sig. (2-tailed)	.001
	N	162
Q8	Pearson Correlation	.949**
	Sig. (2-tailed)	.001
	N	162
Q16	Pearson Correlation	.956**
	Sig. (2-tailed)	.000
	N	162

**. Correlation is significant at the 0.01 level (2-tailed).

its requirements. “) have a statistically significant linear relationship ($p < .001$) with the item Q20 (“The e-learning system tools were used effectively in a way that helps me in achieving the course outcomes.”). Moreover, the direction of the relationship is positive (i.e., Q3, Q4, Q8, Q16 and Q6 are positively correlated), meaning that these variables tend to increase together. Hence, the second hypothesis H2 is supported.

c. Effectiveness of the online systems and the promptness of IT team support in PNU

In what follows we are trying to approve or disapprove our second hypothesis H3, that is:

H5: Issues Related to the Online Systems and the IT Support are not Considered in PNU

The third hypothesis is built on information gathered from the survey (i.e. dimension 5) as well as data provided by the department of online learning and the IT department in the university. This hypothesis is supported based on the results of the items Q19 (“Ease of use of the e-learning system tools applied in the course.”), Q20 (“The e-learning system tools were used effectively in a way that helps me in achieving the course outcomes.”) and Q21 (“Rapid response of the IT support team to meet my needs and solve technical problems through various communication channels.”) of the survey as shown in Table 4. Indeed, students are deemed to be satisfied of the effectiveness of online systems and the prompt IT support. In another hand, the university has tried to help students who lack computers and/or facing internet connectivity issues.

DISCUSSION AND CONCLUSION

Summary of the Results

The five hypotheses defined in this study were confirmed based on the responses of 5010 students to the survey. One of the positive points of this study is the large number of students participating in the survey. This survey sought to see how successful the shifting to online learning during

COVID-19 lockdown is in PNU and what dimensions are influencing this success. It seems that the five dimensions, we considered are the most significant for a successful transition to online learning.

It is evident from the results of the present study that the majority of students have shown a positive perception towards online learning systems in use in PNU. This research confirmed that flexible curricula and flexible technological system provide and deliver the educational material to all groups of students. However, some students have found that online learning is less appealing due to its limitations with respect to practical orientation of some courses in some disciplines (e.g. nursing, medical, dental).

We considered that the success of PNU university is related to the prepared online environment previousily of Corona Virus crisis. PNU university has prepared a quantitative development plan in online learning that mentions five dimentions: planning, preparation and organization, learning and teaching environment, instructional and technological adequacy of the teacher, Learning resources and feedback and e-learning environment and IT support. It has devoloped a plan for future policies in line with best practices and pionnering experiences. Furthermore, the cited points facilates the online tansition in learning.

Theoretical and Practical Implications

We employed in-depth survey to identify student's continuous learning intentions during Corona virus outbreaks. This research contributes to our understanding of student's perceptions of online learning from five dimensions. In line with existing studies that emphasized evaluating experiences of online transition and study its effect on stakeholders in education (i.e. faculty, administrators, and students), our research uncovers evaluate the transition to online learning in Princess Nourah Bint Abdulrahman University (PNU) in KSA from the student perspective. Compared with existing research on educational technology that analyses the learner's satisfaction, our research compares students' perceptions according to disciplines (humanities and scientific) and to level of course practical orientations.

Practically, the research findings may help stakeholders better examines the requirements of students in online learning according to different disciplines and types of courses. It encourages teachers to apply various forms of online learning practices, especially in courses with practical orientations (use of medical lab, use of software, etc). Moreover, since our results show that the impact of using online learning by all PNU students before the Corona Virus outbreaks facilitates the transition, it is suggested to researchers taking these significant initiatives toward ensuring online learning transition during a crisis.

LIMITATIONS AND FUTURE RESEARCH

Our results suffer from a number of limitations that should be noted, one of them being that the study is limited to female students and does not include male students, which is a limitation. Therefore, results of the study cannot be generalized and can be extended to male students from other universities in KSA in future studies. This study is focused on the success of online shifting from students' perspective. Yet, the transition has effected faculties and administrators too. Thus, in future studies, we should focus on the satisfaction of these stakeholders and the challenges they face.

ACKNOWLEDGMENT

This research was funded by the Deanship of Scientific Research at Princess Nourah bint Abdulrahman University through the Fast-track Research Funding Program.

REFERENCES

Abbasi, S., Ayoob, T., Malik, A., & Memon, S. I. (2020). Perceptions of students regarding E-learning during Covid-19 at a private medical college. *Pakistan Journal of Medical Sciences, 36*(S4). doi:10.12669/pjms

Al-Asmari, A., & Rabb Khan, M. (2014). E-learning in Saudi Arabia: Past, present and future. Near and Middle Eastern Journal of Research in Education. 10.5339/nmejre.2014.2

Ali, N. (2020). *Students disappointed with online teaching system amid COVID-19*. Retrieved from https://dailytimes.com.pk/587446/students-disappointed-with-online-teaching-system-amid-covid-19

Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). A. Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. *Education and Information Technologies*, *25*(6), 1–20. doi:10.1007/s10639-020-10219-y PMID:32837229

Ashokka, B., Ong, S. Y., Tay, K. H., Loh, N., Gee, C., & Samarasekera, D. (2020). Coordinated responses of academic medical centres to pandemics: Sustaining medical education during COVID-19. *Medical Teacher*, *42*(7), 762–771. Advance online publication. doi:10.1080/0142159X.2020.1757634 PMID:32401085

Bao, W. (2020). COVID -19 and online teaching in higher education:A case study of Peking University. *Human Behavior and Emerging Technologies*, *2*(2), 113–115. Advance online publication. doi:10.1002/hbe2.191 PMID:32510042

Berezhna, S., & Prokopenko, I. (2020). Higher Education Institutions in Ukraine during the Coronavirus, or COVID-19, Outbreak: New Challenges vs New Opportunities. *Revista Romaneasca pentru Educatie Multidimensionala, 12*(1Sup2), 130-135. 10.18662/rrem/12.1sup2/256

Bolliger, D. U., & Halupa, C. (2018). Online student perceptions of engagement, transactional distance, and outcomes. *Distance Education*, *39*(3), 299–316. doi:10.1080/01587919.2018.1476845

Cook, D., & Dupras, D. (2004). A practical guide to developing effective web-based learning. *Journal of General Internal Medicine*, *19*(6), 698–707. doi:10.1111/j.1525-1497.2004.30029.x PMID:15209610

Dziuban, C. M., Moskal, P., Thompson, J., Kramer, L., DeCantis, G., & Hermsdorfer, A. (2015). Student satisfaction with online learning: Is it a psychological contract? *Online Learning*, *19*(2). Advance online publication. doi:10.24059/olj.v19i2.496

Gamage, D., Perera, I., & Fernando, S. (2015). A framework to analyze effectiveness of eLearning in MOOC: Learners perspective. In *8th International Conference on Ubi-Media Computing (UMEDIA)* (pp. 236-241,). Colombo: IEEE. doi:10.1109/UMEDIA.2015.7297461

Hiij, B., Ting, S., Heng, W., Kong, Y., Pathy, N., & Zaki, R. (2020). *How medical students can respond to the Covid-19 pandemic 21.* Retrieved from https://www.thestar.com.my/opinion/letters/2020/04/21/how-medical-students-can-respond-to-the-covid-19-pandem

Johnson, N., Veletsianos, G., & Seaman, J. (2020). U.S. Faculty and Administrators' Experiences and Approaches in the Early Weeks of the COVID-19 Pandemic. *Online Learning*, *24*(2). Advance online publication. doi:10.24059/olj.v24i2.2285

Ke, F., & Kwak, D. (2013). Constructs of Student-Centered Online Learning on Learning Satisfaction of a Diverse Online Student Body: A Structural Equation Modeling Approach. *Journal of Educational Computing Research*, *48*(1), 97–122. doi:10.2190/EC.48.1.e

Keengwe, J., Schnellert, G., & Mills, C. (2012). Laptop initiative: Impact on instructional technology integration and student learning. *Education and Information Technologies*, *17*(2), 137–146. doi:10.1007/s10639-010-9150-8

Kuo, Y.-C., Walker, A., Belland, B., & Schroder, K. (2013). A predictive study of student satisfaction in online education programs. *The International Review of Research in Open and Distributed Learning*, *14*(1), 16–39. doi:10.19173/irrodl.v14i1.1338

Liaw, S. S., & Huang, H. (2013). learning environments as predictors to self-regulation in e-learning environments. *Computers & Education*, *60*(1), 14–24. doi:10.1016/j.compedu.2012.07.015

Martin, F., & Parker, M. (2014). Use of Synchronous virtual classrooms: Why, who and how? *Journal of Online Learning and Teaching*, *10*(2), 192–210.

Moawad, R. (2020). Online Learning during the COVID- 19 Pandemic and Academic Stress in University Students. *Revista Romaneasca pentru Educatie Multidimensionala, 12*(1Sup2), 100-107. doi:doi:10.18662/rrem/12.1sup2/252

Moore, J. (2014). Effects of Online Interaction and Instructor Presence on Students' Satisfaction and Success with Online Undergraduate Public Relations Courses. *Journalism & Mass Communication Educator*, *69*(3), 271–288. doi:10.1177/1077695814536398

Noesgaard, S., & Ørngreen, R. (2015). The Effectiveness of E-Learning: An Explorative and Integrative Review of the Definitions, Methodologies and Factors That Promote e-Learning Effectiveness. *Electronic Journal of e-Learning, 13*(4), 278-290.

Nwankwo, A. (2015). Students' Learning Experiences and Perceptions of Online Course Content and Interactions. *Walden Dissertations and Doctoral Studies*, 188. https://scholarworks.waldenu.edu/dissertations/188

Schneider, S. L., & Council, M. (2020). Distance learning in the era of COVID-19. Archives of Dermatological Research, 1–2. doi:10.1007/s00403-020-02088-9

Selvi, K. (2010). Motivating factors in online courses. *Procedia - Social and Behavioral Sciences, 2*(2), 819-824. 10.1016/j.sbspro.2010.03.110

Shackelford, J. L., & Maxwell, M. (2012). Sense of community in graduate online education: Contribution of learner to learner interaction. *The International Review of Research in Open and Distributed Learning*, *13*(4), 228–249. doi:10.19173/irrodl.v13i4.1339

Shelton, B. E., Hung, J., & Lowenthal, P. (2017). Predicting student success by modeling student interaction in asynchronous online courses. *Distance Education*, *38*(1), 59–69. doi:10.1080/01587919.2017.1299562

Sher, A. (2009). Assessing the Relationship of Student-Instructor and Student-Student Interaction to Student Learning and Satisfaction in Web-Based Online Learning Environment. *Journal of Interactive Online Learning*, *8*(2).

SPSS. (2020). *IBM Corp. Released 2020. IBM SPSS Statistics for Windows, Version 20.0*. IBM Corp.

Telles-Langdon, D. M. (2020). Transitioning University Courses Online in Response to COVID-19. *Journal of Teaching and Learning*, *14*(1), 108–119. doi:10.22329/jtl.v14i1.6262

Watermeyer, R., Crick, T., Knight, C., & Goodall, J. (2020). COVID-19 and digital disruption in UK universities: Afflictions and affordances of emergency online migration. *Higher Education*, 1–19. Advance online publication. doi:10.1007/s10734-j PMID:32836334

Weidlich, J., & Bastiaens, T. (2018). Technology matters – The impact of transactional distance on satisfaction in online distance learning. *The International Review of Research in Open and Distributed Learning*, *19*(3). Advance online publication. doi:10.19173/irrodl.v19i3.3417

Yang, D., Baldwin, S., & Snelson, C. (2017). Persistence factors revealed: Students' reflections on completing a fully online program. *Distance Education*, *38*(1), 23–36. doi:10.1080/01587919.2017.1299561

Fahima Hajjej has a PhD in computer science (2016/2017), from the Faculty of Sciences of Sfax. She is actually an assistant professor in the Department of Information Systems, College of Computer and Information Sciences at PNU, Saudi Arabia. She is a member of the Research Laboratory in Technologies of Information and Communication and Electrical Engineering (LaTICE). Her research interests include the modelling concepts of e-learning, e-assessment, integration of formal and semi-formal methods, Data science and Big data.

Sarra Ayouni has a PhD in computer science (2012/2013), from the Faculty of Sciences of Tunis (FST) and from the University of Montpellier 2 (France). She is specialized in Data mining filed. She is actually assistant Professor in Information Systems department of the College of Computer and Information Sciences in Princess Nourah Bint Abdulrahman University (PNU) and she is currently the Distance Education Coordinator of the college.

Hadil Shaiba obtained her Ph.D. in Computer Science from Southern Methodist University, U.S.A. She is currently the Vice Dean of Graduate Studies and Scientific Research at the College of Computer and Information Sciences, Princess Nourah bint Abdulrahman University, Saudi Arabia. Her research interest includes data mining, machine learning, data analytics and visualization. She is currently working on applications in healthcare, traffic accidents, meteorology, and education.

Ala Alluhaidan received her B.Sc. degree in computer science from Princess Nourah bint Abdulrahman University Riyadh, Saudi Arabia, her M.Sc. degree in Computer Information Systems from the Grand Valley State University, MI USA, and her Ph.D. degree in Information Systems & Technology from Claremont Graduate University, CA USA. She is currently an assistant professor with the Department of Information Systems, Princess Nourah bint Abdulrahman University, Saudi Arabia. Her research interests include health informatics, big data analytics, machine learning.