



## Microsoft teams as an online education system in higher education: The case for Jordan

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### ABSTRACT

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This study seeks to determine the effectiveness of Microsoft Teams as an online education system in higher education. The researchers developed and tested a path model with factors related to the effectiveness of Microsoft Teams according to the views of students. Using random sample procedures, data from 3,572 undergraduate students was acquired. According to the findings, undergraduate students thought that Microsoft Teams was a useful online teaching tool and had positive opinions of online learning. The outcomes also validate the postulated path model, according to which the two antecedent factors—technical support and Microsoft Teams' class features—which had positive impacts on the usefulness of the instructional method. Additionally, a positive correlation was found between online interaction and the usefulness of the instructional method. Ultimately, the main factor that greatly affects exam satisfaction and perceived learning outcomes is online interaction. However, students' opinions of the university's technical assistance were less positive, and their level of exam satisfaction was below expectations. The study provides a number of practical and theoretical implications for the field of study. For example, it is expected that this research will provide valuable information for decision makers in the Jordanian government (e.g., Ministry of Higher Education) to take clear and precise steps to help higher education minimize the threats and challenges to students' learning. Global researchers and practitioners can use this research model to cope with unexpected situations and crises, such as the COVID-19 pandemic, that may arise in the future.

**Contribution/Originality:** The present study proposed and tested a research-based path model related to features of Microsoft Teams as an online learning platform in higher education. The findings will enable universities and faculty members to take proactive steps regarding the facilitators and limitations of online learning.

## 1. INTRODUCTION

The quick revolution in technology has impacted the teaching–learning process. In order to provide students with more options for education, schools and colleges have transitioned to integrated learning environments and have made courses available online (Pal & Vanijja, 2020). Online learning implemented by higher education institutions has many benefits, such as accessibility, affordability and flexibility, which may lead to increasing students' enrollment in online classes and programs (Zhang et al., 2022).

The COVID-19 pandemic drove educational systems across the world to switch from campus-based lessons to online lessons using tools such as Google Classroom, Zoom, Cisco WebEx, and Microsoft Teams, to allow the continuity of education during the crisis (Bordoloi, Das, & Das, 2021; Ho et al., 2020; Pal & Vanijja, 2020; Sreehari, 2020; Toquero, 2020; Webb, McQuaid, & Webster, 2021; Zeshan & Bhatti, 2021). While some universities managed to successfully transition to online learning, many lacked the necessary skills to handle online learning as a teaching method (Arora & Srinivasan, 2020).

Due to the unanticipated disturbance, teachers and learners from K-12 to tertiary education have firsthand experience with remote instruction (Zhang et al., 2022). Because of the quick shift to online learning, academics and professionals are now more inclined to look into what makes online instruction effective.

There is ample evidence that over 1.5 billion schoolchildren and adults have been negatively affected by school and institution closures across the globe (International Association of Universities, 2021). Recent statistics by UNESCO estimated that as many as 60% of students worldwide have been affected due to the closure of educational organizations (UNESCO, 2021). Only those students who have experience with online and blended learning have managed to deal with the transition.

Based on the above, this is the largest movement in digital education compared to previous historical events (Thomas, 2020). This sudden shift has raised questions among scholars related to the efficiency of online learning environments for communicating knowledge (Baber, 2020; Mashau & Nyawo, 2021; Zeshan & Bhatti, 2021).

It is evident that the sudden closure of colleges and universities by mid-March of 2020 and the shift toward online learning brought both opportunities and challenges to the academic community (Ho et al., 2020). Based on the capacity to engage in online learning, these possibilities and barriers may have had a significant impact on students' performance and education. The fact that individuals can learn at their own speed without being limited by time or location has led to positive attitudes among students toward online learning (Lall & Singh, 2020). Further, research indicates that online education is satisfying for students because of factors such as accessibility, convenience, flexibility, and efficiency (Baber, 2020; Sisson & Kwon, 2021; Zeshan & Bhatti, 2021). These benefits can develop critical thinking and reflection, listening, and communication skills, which deepen students' understanding of the learning materials (Martin & Bolliger, 2018).

However, it is well-documented that transitioning from traditional classrooms to online learning has presented challenges for students (Crawford et al., 2020). There are concerns associated with organizational support, content and course design, means of instruction and communication, students' motivation to learn, interaction/engagement issues, assessment tools, and feedback (Adnan & Anwar, 2020; Hodges, Moore, Lojje, Trust, & Bond, 2020; Omotayo & Haliru, 2020). Other concerns mentioned include students' attendance and contribution during class sessions, internet connectivity and bandwidth, and access to computers and smart phones (Dhawan, 2020; Webb et al., 2021).

On March 16, 2020, the Jordanian Ministry of Higher Education issued a directive ordering the closure of all institutions and universities and to shift completely from campus-based instruction to online instruction during the COVID-19 crisis. During the first two weeks, instructors used WhatsApp, Skype, Google Classroom, and learning management systems, such as Moodle, to support students' learning during the closures. Microsoft Teams was first introduced to the teaching process on April 1, 2020, which was a new experience for both students and teachers. This platform has witnessed unprecedented growth worldwide. Furthermore, Jordanian educational officials believe that even after the COVID-19 outbreak, many courses will offer a digital option as standard practice.

## 2. LITERATURE REVIEW

A review of previous research supports the fact that there are positive and negative experiences connected to virtual education during COVID-19. A study by Iqbal, Ashiq, Rehman, Rashid, and Tayyab (2022) investigated the level of satisfaction with online education during the COVID-19 outbreak. A random sample of 707 students was

retrieved from 45 universities in Pakistan. The outcome of the study indicated that students were dissatisfied with the support provided by their university and faculty members, the means of communication and assessment tools, and the availability of electricity and connectivity. In sum, students had a negative experience with online learning and are unlikely to enroll in online courses in the future.

A study by [Salas-Pilco, Yang, and Zhang \(2022\)](#) indicated that students and faculty members need professional training in order to raise the standard of online education, solve internet connectivity issues, and provide students with emotional support. Research by [Balderas-Solís, Roque-Hernández, Salazar-Hernández, and Monsivais \(2022\)](#) looked at how Mexican university students felt about online education. Replies from 909 students were gathered using a survey approach, and the findings showed that several elements of online learning, such as class recordings, teacher interactions and online demos, were well received by students, but they also expressed worries regarding projects, assignments, videos and tests.

[Egielewa, Idogho, Iyalomhe, and Cirella \(2022\)](#) examined how Nigerian university students felt about online education during COVID-19. Data from a sample of 1,134 pupils was gathered using a quantitative survey approach, and the findings showed that due to inadequate internet infrastructure and a shortage of energy, students were dissatisfied with online learning. In order to ascertain the obstacles that Pakistani higher education institutions experienced while implementing online education due to the COVID-19 epidemic, [Khan, Ahmed, and Khan \(2022\)](#) carried out a thorough assessment of the literature. Their conclusions demonstrated that barriers to higher education include those pertaining to digital knowledge and competence, access to equipment, organizational support, and preparedness for change.

Twenty-six research studies that examined the function of learning technology during higher education institutions' shift to online learning that were published between February 2020 and October 2020 were examined in depth ([Turnbull, Chugh, & Luck, 2021](#)). The findings demonstrated that social media, Zoom, Microsoft Teams, and learning management systems were among the technologies utilized throughout the shift. The study's results also revealed four barriers to online learning: academic dishonesty, teacher and student online proficiency, access, and usage of blended synchronous/asynchronous learning applications.

[Barhoumi, Alsaysi, and Essid \(2022\)](#) conducted a study in Saudi Arabia to ascertain the efficacy of the online platforms utilized during COVID-19 through the opinions of university students. Data from a sample of 1,196 pupils was gathered via a survey, and the findings suggested that the use of multimedia did not improve students' experiences with online learning platforms and that learning from these resources—which include images, videos, simulations, animations and multimedia—was not made easier.

[Zhou and Zhang \(2021\)](#) examined how American college students perceived their experiences with online learning. Information was gathered from 62 students using a survey approach, and the findings showed that interactions between students and faculty members were not always positive for the students.

In order to ascertain the challenges perceived by university students in making the switch to online learning, [Petillion and McNeil \(2020\)](#) employed a mixed methodology approach. The study's conclusions suggested that online anxiety, commitment, scheduling, and communication with faculty members were the most common challenges.

In order to succeed, students and instructors should be trained and guided on various features of the online platform used. For example, Microsoft Teams is a communication platform that is efficient, convenient and secure, reinforcing students' discipline and providing positive learning outcomes ([Henderson et al., 2020](#)). It offers features for video conferencing, team creation (virtual classes), meetings, recorded sessions, exam features, assignments, file storage, website sharing, muting and unmuting options, whiteboard use, chat options, and posts.

Within the context of online learning, students engage in a learning experience that is executed in both synchronous and asynchronous modes utilizing communication devices such as smartphones and laptops with internet connection ([Singh & Thurman, 2019](#)). The way that a synchronous learning environment is set up allows

students to participate in live lectures, communicate with teachers and other students in real time, have discussions in relation to stress and course activities, and offer the opportunity for prompt feedback from instructors and peers (Basilaia, Dgebuadze, Kantaria, & Chokhonelidze, 2020; Dhawan, 2020). However, in an asynchronous learning environment, students can learn at any time and at their own pace (Lin & Gao, 2020) through recorded lectures, stored files, and questions posted by instructors and peers. In this setting, students do not feel pressured to respond immediately, they are able to provide points of view in more detail, and they can develop self-directed learning (Cho, Kim, & Choi, 2017).

### 2.1. Research Problem

The COVID-19 pandemic affected school systems globally. Jordan, like any other nation, sent out orders to all of its institutions and universities to switch to offering entirely online courses. Additionally, many university courses were expected to be available online after the crisis. Students' perceptions of online education are crucial to the success of any virtual learning initiatives as they are among the most important stakeholders in higher education (Mailizar, Almanthari, & Bruce, 2020). Prior studies on COVID-19 have primarily been conducted in industrialized nations, including the United States, Europe, China, and others. However, in the Middle East, including Jordan, not much study has been done. For a better understanding of research in this area, the present study aims to examine university students' perceptions of the efficacy of Microsoft Teams following the outbreak of COVID-19. Another purpose of the study was to develop and test a comprehensive path model that determines the efficacy of Microsoft Teams as an online educational tool. In light of this, the following research goals were established:

1. Determine the perceptions of undergraduate students from a selected public university in Jordan of the effectiveness of Microsoft Teams as an online learning platform.
2. Test a path model in which technical support and Microsoft Teams' class features are hypothesized to have a positive link with the usefulness of instructional methods. Moreover, a path from the usefulness of instructional methods is hypothesized to have a positive link with online interaction. Further, a path from online interaction is hypothesized to have a positive link with perceived learning outcomes and exam satisfaction. Figure 1 illustrates the hypothesized relationships in the path model.

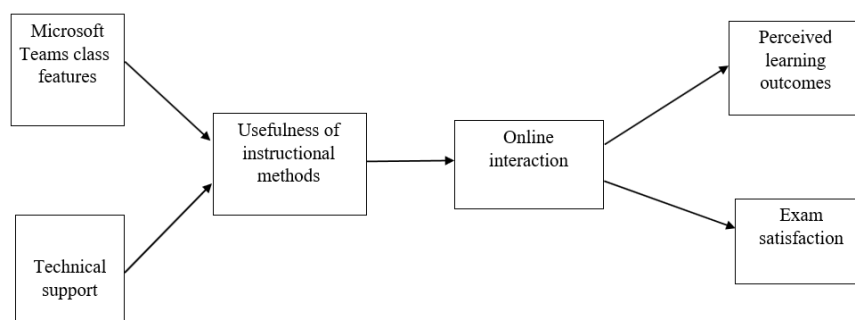


Figure 1. Theoretical model for the effectiveness of Microsoft Teams as an online learning platform.

## 3. METHODOLOGY

### 3.1. Study Context

Online learning is not often employed in Jordan since the majority of higher education institutions provide courses using traditional teaching methods. However, the university under study has been using online learning for mandatory courses for the past few years through the limited version of the "Moodle" learning system. This system encompasses the use of the internet, discussion groups, and online feedback. However, it lacks the features of online exams, online sharing of learning and resource materials, online mentoring, animations, audio and video

communications, and an electronic whiteboard. Moreover, emergency online learning in its current form is new and sudden, which requires rapid learning and adaptation.

Further, blended learning has been incorporated in many university courses. Despite the COVID-19 pandemic, this university did not encounter significant difficulties in carrying out its instructional programs since it had already built online and mixed learning platforms. Training workshops and educational videos were provided for faculty members and students to learn how to use the Microsoft Teams platform. The information and technology center was instructed to provide support for all stakeholders.

### 3.2. Research Design

Utilizing a quantitative descriptive research approach (such as means and standard deviations), this study gathered information via an online survey to assess Microsoft Teams' efficacy as an online learning tool during COVID-19. The Pearson correlation coefficient was used to assess how strongly the predicted variables were related to one another. Standardized regression coefficients were employed to assess path models pertaining to the direct effects among the variables. Jeffrey's Amazing Statistics Program (JASP) 15.0 was used to perform a path analysis to assess the model fit.

### 3.3. Study Participants and Procedures

Data collection took place in the second semester of the 2020–2021 academic year between June 1 and June 21, more than a year after the closure of Jordan's higher education institutions because of the COVID-19 outbreak. During that period, all university courses were delivered online through Microsoft Teams. To generate the sample for the study, compulsory and elective university courses as well as college courses were randomly selected. Only sophomores, juniors and seniors were selected to participate because they attended traditional classes and fully online classes. These procedures resulted in an accessible population of 5,690 undergraduate students from a single Jordanian public university (more than 30% of the total student population). To obtain consent to participate, the students were assured of the voluntary and anonymous nature of the study. Instructors of the selected courses were contacted by the authors who requested their cooperation in posting a survey link to Google Forms through various means, including Microsoft Teams, WhatsApp and other chat tools. A total of 3,572 participants returned the surveys, a reply rate of approximately 63%. Of the participants, 1,474 (41.3%) were male and 2,098 (58.7%) were female, 911 (25.5%) were from social science colleges and 2,661 (74.5%) were from science colleges, 1,167 (32.7%) were sophomores, 893 (25.0%) were juniors and 1,512 (42.3%) were seniors.

### 3.4. Instrumentation

The literature on online learning, best practices and undergraduate education was carefully reviewed before creating the survey that was used in this study (e.g., (Bangert, 2008; Chickering & Gamson, 1987; Chu, Liu, So, & Lam, 2021; Eom & Ashill, 2016; Nikou & Maslov, 2021; Pal & Vanijja, 2020; Zhou & Zhang, 2021)). A demographics component was incorporated to offer an overview of the sample with respect to gender, academic level, and college. Thirty questions in total, covering six criteria, were developed and assessed using a five-point rating system with the following anchors: 1 for "bad," 2 for "low," 3 for "moderate," 4 for "good," and 5 for "high." Three content judges—faculty members with experience in online learning and surveys—were given these items to review.

The final survey was named the "*Effectiveness of the Microsoft Teams Scale*" (EMTS). The EMTS factors along with their items were as follows: *Online interaction* (five items), *usefulness of instructional methods* (five items), *exam satisfaction* (four items), *perceived learning outcomes* (four items), *technical support* (two items), and *Microsoft Teams' class features* (five items).

To support the construct validity of the scale measures, an exploratory factor analysis (EFA) was carried out on the 25 items using direct oblimin as the rotation approach (Hair, Anderson, Tatham, & Black, 1998). For items to be retained on factors, a minimum loading of 0.30 was necessary. The factor loadings in this solution ranged from 0.33 (low) to 0.87 (high). The first factor, "perceived usefulness of instructional methods," is represented by five items and accounted for 46.24% of the variance; the second factor is "online interaction," which was represented by five items and accounted for 4.20% of the variance; the third factor was "exam satisfaction," which was represented by four items and accounted for 3.40% of the variance, the fourth factor was "perceived learning outcomes," which was represented by four items and accounted for 2.73% of the variance, the fifth factor was "usefulness of instructional methods," which was represented by five items and accounted for 2.00% of the variance, and the sixth factor was "technical support," which was represented by two items and accounted for 1.31% of the variance. To evaluate the model fit, the six-factor model was subjected to a confirmatory factor analysis (CFA) with JASP 15.0. The results showed sufficient fit indices (GFI = 0.93; CFI = 0.95; NFI = 0.95; NNFI = 0.94; RMSEA = 0.05; SRMR = 0.03) (Byrne, 1998).

## 4. RESULTS

### 4.1. Objective One

To find out how undergraduate students at a single Jordanian public institution felt about Microsoft Teams' efficacy as an online learning tool, means and standard deviations were employed. The classification of data was high for those over 3.66 and low for those below 2.33. As shown in Table 1, all subscales used in this study (Microsoft Teams' class features, online interaction, usefulness of instructional methods, learning outcomes, technical support, and exam satisfaction) exhibited moderate levels as indicated by their overall mean values. Cronbach's alpha reliability estimates were valid for all subscales, with values ranging from 0.75 to 0.91.

**Table 1.** Descriptive statistics for the efficacy of Microsoft Teams as an online education.

| Subscale                            | $\alpha$ | Mean | SD   | Level    |
|-------------------------------------|----------|------|------|----------|
| Microsoft Teams' class features     | 0.88     | 3.57 | 0.93 | Moderate |
| Online interaction                  | 0.83     | 3.47 | 0.91 | Moderate |
| Usefulness of instructional methods | 0.83     | 3.46 | 0.90 | Moderate |
| Learning outcomes                   | 0.91     | 3.07 | 1.14 | Moderate |
| Technical support                   | 0.75     | 2.97 | 1.12 | Moderate |
| Exam satisfaction                   | 0.85     | 2.96 | 1.05 | Moderate |

### 4.2. Objective Two

The second objective was to test a hypothesized path model for the effectiveness of Microsoft Teams as an online education tool as perceived by undergraduate students from the selected public university in Jordan.

**Table 2.** Correlations among the hypothesized factors related to the efficacy of Microsoft Teams as an online education tool.

| Subscale                               | 1  | 2      | 3      | 4      | 5      | 6      |
|--|----|--------|--------|--------|--------|--------|
| 1. Technical support                   | -- | 0.59** | 0.66** | 0.64** | 0.53** | 0.64** |
| 2. Usefulness of instructional methods |    | --     | 0.70** | 0.70** | 0.69** | 0.62** |
| 3. Learning outcomes                   |    |        | --     | 0.71** | 0.63** | 0.65** |
| 4. Microsoft Teams' class features     |    |        |        | --     | 0.61** | 0.64** |
| 5. Online interaction                  |    |        |        |        | --     | 0.54** |
| 6. Exam satisfaction                   |    |        |        |        |        | --     |

Note: \*\*  $p < 0.01$ .

The correlations between the variables were established before the structural modeling (path analysis). The correlation matrix shown in Table 2 indicates that technical support was positively associated with the usefulness of

instructional methods ( $r = 0.59, p < 0.01$ ) and that Microsoft Teams' class features were positively associated with the usefulness of instructional methods ( $r = 0.70, p < 0.01$ ). Moreover, the usefulness of instructional methods was positively associated with online interaction ( $r = 0.69, p < 0.01$ ), and online interaction was positively associated with exam satisfaction ( $r = 0.54, p < 0.01$ ) and perceived learning outcomes ( $r = 0.63, p < 0.01$ ).

#### 4.3. Path Analysis

Using JASP 15.0, five fit indices were investigated. According to Byrne (1998) these indices are the standardized root mean residual (SRMR), the goodness-of-fit index (GFI), the comparative fit index (CFI), the non-normed fit index (NNFI), and the root mean square error of approximation (RMSEA). For an acceptable degree of fit, a GFI, CFI, and NNFI value of 0.90 or higher is often advised (Hair et al., 1998). Lastly, models that exhibit a strong fit to the data are indicated by RMSEA values smaller than 0.10 (Byrne, 1998). The square root of the mean residuals between the suggested model and the data is represented by the SRMR. Values smaller than 0.05 often indicate that the model and the data are well matched. All of the estimations' standard errors were low enough to indicate that they are mostly accurate. This model tried seven different pathways. Figure 2 presents the regression coefficients ( $R^2$ ) for each path, summarizing the findings of the path study. As can be shown, there was support for all seven of the proposed pathways ( $p < 0.01$ ). The model shows high predictive power where Microsoft Teams' class features explained 58% of the variance in usefulness of instructional methods, and technical support explained 31% of the variance in usefulness of instructional methods. Usefulness of instructional methods explained 84% of the variance in online interaction, and online interaction explained 96% of the variance in perceived learning outcomes and 86% of the variance in exam satisfaction.

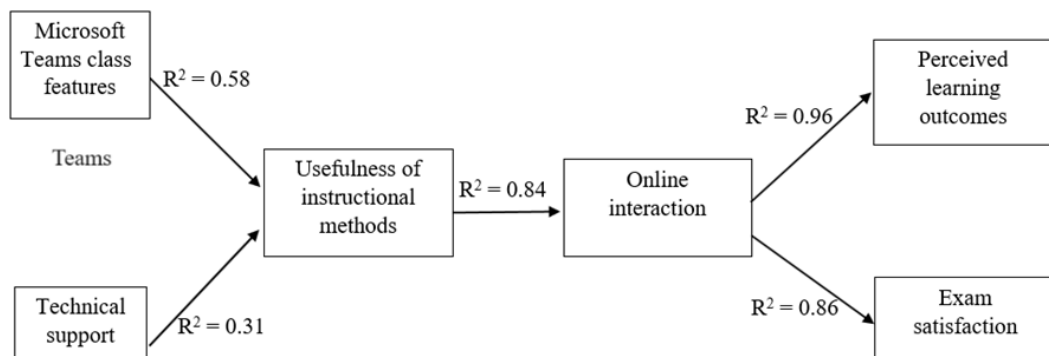


Figure 2. A supported model for the effectiveness of Microsoft Teams as an online learning platform.

## 5. DISCUSSION

Higher education institutions faced significant challenges in delivering teaching via online learning platforms due to the COVID-19 pandemic. Jordan, like many other countries, suffered from COVID-19, and a lockdown of all universities was imposed by the government to curb the spread of the disease. As a result, university students were faced with novel technology due to the requirement to learn online. Consequently, the purpose of this study was to ascertain how undergraduate students felt about the efficacy of Microsoft Teams as an online learning tool. Based on the results of the study, undergraduate students perceived Microsoft Teams as an effective online mode of delivery and expressed positive views of learning using the platform. This aligns with other studies that have shown the efficacy of online learning platforms as learning resources during the pandemic (Muthuprasad, Aiswarya, Aditya, & Jha, 2021).

Students had favorable experiences with Microsoft Teams' class features, such as accessibility to class materials and resources, convenient class attendance, ease of use, variety of tools, and time saving. Research asserts that virtual classrooms with such features are important for enhancing students' learning (Pal & Vanijja, 2020; Reyes-Fournier, Cumella, Blackman, March, & Pedersen, 2020). Students also reported favorable experiences with online

interactions concerning assignments, recorded lectures, fellow students, faculty members, class meetings and discussions. Online interaction and cooperation are regarded as key driving forces for success in online classes (Muthuprasad et al., 2021).

Moreover, students had favorable views of the usefulness of instructional methods during online lessons, such as real-time lectures, PowerPoint presentations, whiteboard, PDFs and Word files, and internet links. Pal and Vanijja (2020) indicated that faculty members can use the file sharing feature to upload different class materials as an effective method of instruction. Further, it is important to incorporate different types of instructional approaches to enable students to adapt to online learning (Muthuprasad et al., 2021). As noted by the results, these three aforementioned factors received the highest mean values. Therefore, it is logical to say that these are internal factors that are the most important to students during online learning because they are related to the utilization of their knowledge, skills, and abilities in unfamiliar learning contexts to achieve their desired outcomes (Agonács & Matos, 2019).

The results also showed that three external factors (learning outcomes, technical support, and exam satisfaction) are also related to the effectiveness of Microsoft Teams as an online learning platform. With regard to learning outcomes, students indicated that online learning using Microsoft Teams increased their learning outcomes, maximized their responsibility for self-paced learning, stimulated their interests in online learning courses, and improved their technical skills.

However, technical support and exam satisfaction received the lowest mean values. This means that the technical support provided by the university through training workshops and the availability of information for technology staff to solve technical problems was not at the desired level. This is supported by previous research where technical problems and inadequate support were found to hinder online learning (Dhawan, 2020). Further, exam satisfaction related to fairness in grading, post-exam feedback from the instructor, sufficient time to complete exams, and the relatedness of exam questions to class materials is another external factor that needs further attention. The lowest mean value for exam satisfaction was expected due to the grade-oriented culture in Jordan. Public opinion and dissatisfaction with online learning as a substitute for university instruction has pressured the Ministry of Higher Education to issue a pass/fail policy or an actual grade with regard to academic courses.

In short, Microsoft Teams is an effective online learning platform, although the transformation into a fully online mode is a new experience for both universities and students. The unique characteristics of Microsoft Teams, the technological competencies of faculty members conducting online learning, and the policies of higher education institutions have all contributed to the success of online learning during COVID-19 for the university under study. It is important to mention that faculty members have been using blended learning tools for university courses since 2002 (Blackboard since 2002 and the limited version of the Moodle-based online learning platform since 2012).

Faculty members used these platforms to upload class materials, post discussion questions, and conduct quizzes. It is also suggested that faculty members play an essential role in fostering online learning by assisting students in understanding the main values of blended learning (Han & Ellis, 2019). However, these two platforms lack a virtual classroom setup and do not support synchronous or asynchronous learning, which is an important feature of the Microsoft Teams platform (Pal & Vanijja, 2020). Previous research suggested that online platforms should complement the traditional classroom setup to enhance students' learning (Dhawan, 2020).

Another aim of the study was to test a path model which contains the factors that predict the effectiveness of Microsoft Teams as an online learning platform in Jordan. This study established a research-based holistic nomological framework where two antecedent factors, Microsoft Teams' class features and technical support, have a positive impact on the usefulness of instructional methods. The results also established a positive link between the usefulness of instructional methods and online interaction. Finally, online interaction is by far the biggest contributing factor to both perceived learning outcomes and exam satisfaction. These findings align with previous



research suggesting that online interaction is the main determinant of outcome variables, such as perceived learning and satisfaction (Alqurashi, 2019; Nikou & Maslov, 2021).

Interaction is the main theme, regardless of whether students are learning face-to-face or online. For example, students' interactions with colleagues and instructors during class meetings and interactions with assignments within an online learning system can transfer into increased learning outcomes, such as responsibility for self-paced learning (Putistina, Kvasnyuk, & Savateeva, 2019) and interest in online learning. Moreover, online interaction may also positively impact exam satisfaction through the lens of post-exam feedback provided by the instructor, where students learn about the relatedness of exam questions to class materials, and fairness in grading.

By the same token, our model shows that using different instructional methods (e.g., lectures, whiteboard, file sharing, and internet links) is a major contributor to online interaction because students have different individual needs and learning styles (Eom & Ashill, 2016; Tsay, Kofinas, & Luo, 2018). Baber (2020) and Nikou and Maslov (2021) emphasized using different course content and instruction during online learning which is directly and indirectly related to positive learning outcomes. Furthermore, students' ability to participate in different instructional methods is enhanced through the technical support provided by the university as well as the characteristics of Microsoft Teams, such as ease of use and access, convenient attendance, and the variety of tools.

## 6. CONCLUSION

This study is among the few conducted in Jordan to evaluate the efficacy of the Microsoft Teams platform. The overall findings indicate that university students have a positive and favorable attitude toward online learning related to Microsoft Teams' class features, online interaction, usefulness of instructional methods, and learning outcomes. However, students' opinions of the university's technical assistance were less positive, and their level of exam satisfaction was below expectations. This study proposed and tested a research-based path model. The model showed high significant and predictive powers where Microsoft Teams' class features and technical support impacted the usefulness of instructional methods, which, in turn, impacted online interaction. Further, online interaction impacted two outcome variables—perceived learning outcomes and exam satisfaction.

## 7. IMPLICATIONS

The results revealed several important implications for numerous stakeholders, including the government of Jordan, faculty members, university administrators, system designers, and international scholars and practitioners. This research could provide valuable information to the decision makers in the Jordanian government (e.g., Ministry of Higher Education) to take clear and precise steps to help higher education minimize the threats and challenges related to students' learning. Global researchers and practitioners can use this research model to cope with unexpected situations and crises that may arise in the future.

Faculty members and system designers can use these results to consider students' needs, which are centered on self-directed learning, as one of the instructional approaches. Previous research emphasized that problem-based and student-centered learning approaches are essential in today's learning environments. Moreover, faculty members should focus more on an online learning course structure that fits the needs and learning styles of students. However, faculty members and university students should attend training workshops on a regular basis to stay tuned to the developments in learning management systems, such as Microsoft Teams, and how they can be incorporated properly in teaching. Training sessions should also be provided for students to advance their digital literacy skills. According to Barhoumi et al. (2022) students should be trained on how to design e-learning systems and how to incorporate animations, interactive graphics, simulations, and multimedia, accompanied with technical support.

Additionally, the university administration can use the findings to issue policies and instructions related to the design and structure of online courses and the minimum technology requirements for online courses in order to

easily transform traditional university courses into online learning courses. This requires rethinking the goals, evaluations, learning experiences, technology tools, and support to promote self-directed learning (Freire & Rodríguez, 2022). This requires providing more mentoring and training for faculty members to cope with these new demands. Khan et al. (2022) emphasized the significance of developing appropriate strategies for knowledge management, change management, and information technology.

The university administration should use this research model as a diagnostic tool to evaluate faculty handling of online learning courses to gain a deeper understanding of the effectiveness of online learning and blended learning at the end of each semester. Faculty members should receive specialized training on the advanced tools and features incorporated within the Microsoft Teams platform. This could foster the effectiveness of faculty members in implementing different teaching practices and improving the learning opportunities of students. In brief, this should be a standard practice for all colleges and universities in Jordan in the post-COVID era. Also, there should be cooperation between the Ministry of Higher Education and the Jordanian centers for science and technology to stay ahead of change.

With regard to technical support, the university information technology center should maximize students' full potential with regard to technology literacy skills. This can be accomplished through training workshops and continuous online support. Regarding exam satisfaction, it was concluded that public pressure was one of the main reasons behind students' attitudes toward online exams. The public has to be informed about the advantages of online learning both during and after the COVID-19 pandemic by the Ministry of Higher Education and prominent Jordanian speakers. Prior to any further attempts at online learning, this social impact is an essential step that can help with cultural changes to electronic tests and online learning. Additionally, the grading structure should have more focus on online assignments and team projects to facilitate students' learning and acceptance of online evaluation criteria.

This study produced a credible and trustworthy conceptual model that was tailored to the COVID-19 situation in a higher education context. This model is made up of six main components that are associated with the effectiveness of the Microsoft Teams platform in Jordan. This model can serve as a basis for cross-cultural platform evaluation by Microsoft Teams designers.

Theoretically, researchers ought to conduct a similar study at the majority of Jordan's public and private institutions. Further investigation into factors such as students' motivation to use online learning, the availability of online assignments, and barriers to online learning (e.g., cost, network accessibility and stability, class schedule, internet speed and connectivity, type of internet subscription, and devices used) is necessary. Additionally, the conceptual path model proposed in this study should be expanded. It is also recommended for future studies to observe differences among factors based on gender, academic major, and grade point average. Future research should compare perceptions of university students who were exposed to traditional education mixed with fully online education and those who were only exposed to an online mode of instruction during COVID-19.

Further research should also investigate students' experiences related to web-course design and how it affects their academic achievements. Finally, future research should utilize a mixed methodology research design, which involves both quantitative and qualitative aspects, to explore the perceptions of all involved stakeholders (e.g., students, faculty members, administration, and employees in the information and technology center).

There are two shortcomings of this study. Initially, as this study only looks at undergraduate students at one public institution, readers should exercise caution when extrapolating its conclusions and/or consequences for other educational settings, such K-12 and postgraduate programs. Second, future research should combine a qualitative technique with other Likert scale types, as the findings of this study are based on a survey using a five-point anchored scale.

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