

## The effect of teaching methods on university students' intention to use online learning: Technology Acceptance Model (TAM) validation and testing

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### CHRONICLE

### ABSTRACT

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Web 2.0 has changed the way consumers access information. This study aims to investigate the relationship between social media (Watsons' Facebook page) content and consumers repurchase intention. In addition, it determined whether E-WOM and interactivity can act as the mediating variables between the social media content and repurchase decision. The data were collected through online and offline questionnaires. A total of 146 valid questionnaires were obtained and analyzed using Partial Least Square Structural Equation Modeling (PLS-SEM) through the SMART-PLS 3.3.9 software. The findings support the direct effect of social media content on E-WOM, interactivity, and repurchase intention. Moreover, the results confirmed the mediating role of interactivity between social media content and repurchase intention, however, E-WOM does not mediate between social media content and repurchase intention. The present study suggests some managerial implications for beauty brand retailers and provides fundamental strategies related to their social media.

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## 1. Introduction

Many different recent studies have used the Technology Acceptance Model (TAM) while conceptualize their research framework which help prediction of the teachers' intentions of technology using (e.g., Mei et al., 2017; Teo et al., 2017) the factors in TAM such as perceived usefulness or perceived ease of use have been also reported as a key predictor of technology adoption. The TAM played a dominant role in understanding the essential factors and methods of using technology by teachers (Scherer, Siddiq, & Tondeur, 2019). Further, the validity of TAM has been also supported by numerous empirical studies, the model has also provided various inherent limitations. One of the most prominent limitations is associated with the gaps between individuals' intentions to use the modern technology and their actual behaviors of using this technology (Bagozzi, 2007). Even though the connection between the people's intention and technology usage is usually ignored in the TAM-based studies due to their main interests to adopt their intentions, rather than real usage as an outcome factor (Wu & Du, 2012). However, the meta-analyses of TAM-based studies provided findings related to the relationship between intention and

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behaviors hence Turner et al. (2010) for example founded that the behavioral intentions were more likely to be linked with the actual usage, and the results strongly questioned the appropriate methods and ways of using the intention as a factor for technology usage. Obviously, more empirical scholarly works addressing this issue over different contexts are triggered for this topic.

The limitations of using the TAM model, and the variable of usage behaviors are seen as ill-defined at both theoretical and operational aspects (Wu & Du, 2012; Hsu & Lin, 2008). On other hand, Nistor (2014) criticized the single dimension of this model and called for future research works in order to employ the more complex and multi-dimensional variables which better correspond within the real-life learning contexts. Moreover, the previous TAM-based studies have been survey research design, and they generally contributed greatly to the existing scholarly comprehension to understand the factors that affect the technology acceptance (Tondeur et al., 2013). Thus, more studies on qualitative or mixed method nature in the TAM field are in need. Accordingly, to discuss and address the aforementioned limitations during using TAM, the current study mainly aims to explore the innovation in teaching, check to what level teaching methods used are effective and to know what level these methods are used. This exploration for the influence of online learning through the integration of TAM model to expand the understanding of the need for diversity of teaching methods among university students to encourage positive intention to learn among this group. Moreover, this study pursues to conceptualize the technology usage model in five dimensions have not been examined in a single research model called the perceived ease of use, perceived usefulness, and the perceived enjoyment with different teaching methods predictors such as using simulation, using role plays, using flipped classroom, using games and using problem-based learning. In the limited knowledge of the researcher, this study is the first study in its nature in this field with many complicated concepts and constructs which together formulate an original research model could provide new research implications.

## 2. Literature Review & Hypothesis Development

The evaluation process considered the learners attitudes toward an activity, the intention to use a similar learning method in the future and the perceived enjoyment of using this approach. The literature suggested that the learners had good attitudes toward the teaching activities thus they demonstrated great intention to use the similar tool which enables easy learning in the future. However, the perceived enjoyment is seen as the degree of using technology perceived enjoyable thing for learners during the taught activities, and their own right apart from the performance outcomes might expect, the results have found that the perceived enjoyment played an important role in technology acceptance among learners therefore this issue was examined and revealed a correlation between perceived enjoyment and using technology (Yi & Hwang, 2003). On other hand, the previous research has found the perceived enjoyment significantly explains the behavioral intention of the learners (Van der Heijden, 2003). The perceived ease of use indicates the peoples' beliefs about using a particular technology is free of difficulties or hard efforts. It constitutes a significant effect on people's attitudes toward technology usage which in turn influence the intention to use technology (Ifinedo et al., 2018). Integration of different teaching methods and a correlation with the perceived ease of use support the research trends associated with the limitation of examining the relations between the perceived ease of use and learning approach and related outcomes like the perceived satisfaction with the learning experience (Al-Fraihat et al., 2020). Currently, a few related studies which addressed and focused on the teaching methods effect on the perceived ease of use and learning related outcomes as a factor of interest in the conceptual research frameworks (Joo et al., 2011). The studies addressed the determinants of the perceived outcomes which include perceived academic performance. Thus, based on the above discussion the study postulates the following hypothesis.

The perceived usefulness indicates to the extent to which the individuals believe that using the technology ultimately develops their performance (Liu & Huang, 2015). The literature in this context hypothesized that the perceived ease of use influenced the perceived usefulness. Since the perceived usefulness concerns the whole effect of the technology usage on work or academic performance and outcomes the perceived usefulness pertains to the processes of using the technology. However, the simulators considered innovative educational approaches that are generally used in order to overcome the problems among education environments (Zulfiqar et al., 2018). The virtual simulation environment provides good interactive experiences which the students can apply to a theoretical learning, and the technology as well helps them to enhance their critical thinking within the meaningful and reassuring environments (Fagan, Kilmon, & Pandey, 2012). The simulation also can assist the teachers to effectively handle and cope with constraints like lack of supervisory people. Thus, based on the above discussion the study postulates the following hypothesis. Thus, based on the above discussion the study postulates the following hypotheses.

**H<sub>1</sub>:** *Using simulation significantly affects the perceived enjoyment of university students.*

According to Nikhashemi et al. (2019), marketers are nowadays offering a pleasant and pleasant purchase experience to increase their intention to purchase consumers. According to Schmitt (1999), customer experiences are classified into five elements, one of which is the sensory experience (five senses). Marketers stimulate their five senses by motivational stimuli to increase their experiences (Altschwager et al., 2017). The other two elements include affective experience (feeling) and customer's cognitive experience (Schmitt, 1999). Feeling is the most primary level of conscious experience which might be a

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**H<sub>2</sub>:** *Using simulation significantly affects the perceived ease of use of university students.*

**H<sub>3</sub>:** *Using simulation significantly affects the perceived usefulness of university students.*

The method of role-play is a type of communication approach and activity indicated. In the education context, it represents a technique which is usually utilized to teach a foreign language (Atas, 2015). The studies of the roleplaying effect have been conducted by a group of educators within projects which found the students who were involved and introduced to this technique in the classrooms had gained some improvement in the communication while using their mother tongue (Yusof & Alas, 2021). However, the technique of role-play still requires research bases to be discussed and assessed which does not suit all learners. Atas (2015) reported that although this approach could mainly enhance the students' confidence, some of them felt that the activities were too much and needed too many tasks like memorization and role-play. The literature hence reinforced the idea that studying by using different teaching techniques is essential and can produce empirical implications for the practitioners.

The literature examined a relationship between perceived usefulness and perceived ease of use towards the behavioral intentions of using the role-play games in the classroom for. Most studies used the Technology Acceptance Model as a guide and

principle to conduct these studies. The population was public university students through a structured self-administration used to collect the data (Alsabawy, Cater-Steel, & Soar, 2016). The results showed a strong correlation of the positive perceived usefulness and perceived ease which help to increase the students' behavioral intention of using a method of role-play games in classrooms to teach language. In general, the results implied the students' agreed with incorporating the role-play games in this setting and recommended the teachers to use this approach during the teaching process (Toni Mohr, Holtbrügge & Berg, 2012). By integrating the TAM model, the implications and study outcomes provided new significant insights into teaching practice and theory, and the research's significant contribution generally expanded the students' perception with a better understanding of using the role-play games in the classrooms. Thus, based on the above discussion the study postulates the following hypothesis.

The educational institutions today invest largely in the information systems in order to generate benefits like increasing the education accessibility and improving the self-efficacy through a knowledge generation (Sinclair et al., 2016). The intention of these institutions to develop the teaching methods through involvement with different methods lead to emerging new learning applications such as e-learning applications. The traditional learning systems are seen an outdated and need for further inclusion of the most important and modern web-based approach among the education sector (Islam, 2016). At current, the different institutional stakeholders like students and instructors have realized the significance of using web-based applications. The Perceived usefulness of the e-learning systems by the key stakeholders also considers as an outcome of the different major inputs like the information and human inputs. Thus, based on the above discussion the study postulates the following hypotheses.

**H4:** *Using role plays significantly affects the perceived enjoyment of university students.*

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**H5:** *Using role plays significantly affects the perceived ease of use of university students.*

**H6:** *Using role plays significantly affects the perceived usefulness of university students.*

The flipped or sometimes called a reversed classroom approach is a strategy which supports the advanced active learning methods and improves the students' performance, while reducing the failure rates in education (Al Jarrah, Thomas, and Shehab, 2018). The students in the learning model learn the basic contents through different teaching methods like a tutorial video or recorded lecture over the virtual learning material. The classroom timers are used for problem-solving with a deep coverage within depth discussion and personal interaction (Jensen et al., 2018). Thus, flipped classroom learning can also offer opportunities to conduct meaningful teamwork as well increase the students' critical thinking and satisfaction (Murillo-Zamorano et al., 2019). Also, the literature showed that the flipped classroom method can enhance the students' satisfaction and academic achievements, in addition it can develop learning skills in the digital era which support the development of information technology literacy (Zainuddin et al., 2019). Flipped classrooms on the other hand enables the students to have a critical and independent thinking which in turn improves the levels of both knowledge and skill of students in higher education (Graham et al., 2019). This innovative teaching approach also increases the academic outcomes and student's profession and leads to greater involvement in the high quality and effective learning system. TAM seems to be the most popular model widely used to examine the end-users' intention as well identify the determinant factors that might influence their behaviors when the advanced technology adoption is taken into consideration (Abdekhoda et al., 2016). TAM explains the behavioral intentions and flipped classroom use significantly among the studies concerned with web-based advanced technology to develop a conceptual framework in order to identify the critical factors which influence the students' perception in adopting different teaching methods like flipped classroom. Undoubtedly, conducting new research is important to expand the literature in the area of successful technology adoption and the knowledge regarding this issue. Thus, based on the above discussion the study postulates the following hypotheses.

**H7:** *Using flipped classrooms significantly affects the perceived enjoyment of university students.*

According to Nikhashemi et al. (2019), marketers are nowadays offering a pleasant and pleasant purchase experience to increase their intention to purchase consumers. According to Schmitt (1999), customer experiences are classified into five elements, one of which is the sensory experience (five senses). Marketers stimulate their five senses by motivational stimuli to increase their experiences (Altschwager et al., 2017). The other two elements include affective experience (feeling) and customer's cognitive experience (Schmitt, 1999). Feeling is the most primary level of conscious experience which might be a result. Cognitive experience is an innovative way for targeting consumer intelligence and awareness to create a different experience (Bustamante & Rubio, 2017). Schmitt (1999) has introduced behavioral experience and social experience as other aspects of customer experience. According to Bustamante & Rubio (2017), behavioral experiences are behavioral responses driven by brand-related stimuli. They include a part of design of a brand, identity, packaging, marketing communications, and the environment. Social experience means the aspect of social interactions and individual processes are part of the consumer experience, since they not only demand intrinsic performance benefits in interaction with other customers, but also seek social benefits and achieve a deep sense of social involvement in the sales environment. Providing diverse strategies and a combination of different experiences increases the consumers' purchase. According to Nikhashemi et al. (2019), marketers are nowadays offering a pleasant and pleasant purchase experience to increase their intention to purchase consumers. According to Schmitt (1999), customer experiences are classified into five elements, one of which is the sensory experience (five senses). Marketers stimulate their five senses by motivational stimuli to increase their experiences (Altschwager et al., 2017). The other two elements include affective experience (feeling) and customer's cognitive experience (Schmitt, 1999). Feeling is the most primary level of conscious experience which might be a result. Cognitive experience is an innovative way for targeting consumer intelligence and awareness to create a different experience (Bustamante & Rubio, 2017). Schmitt (1999) has introduced behavioral experience and social experience as other aspects of customer experience. According to Bustamante & Rubio (2017), behavioral experiences are behavioral responses driven by brand-related stimuli. They include a part of design of a brand, identity, packaging, marketing communications, and the environment. Social experience means the aspect of social interactions and individual processes are part of the consumer experience, since they not only demand intrinsic performance benefits in interaction with other customers, but also seek social benefits and achieve a deep sense of social involvement in the sales environment. Providing diverse strategies and a combination of different experiences increases the consumers' purchase. According to Nikhashemi et al. (2019), marketers are nowadays offering a pleasant and pleasant purchase experience

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**H<sub>8</sub>:** *Using flipped classrooms significantly affects the perceived ease of use of university students.*

**H<sub>9</sub>:** *Using flipped classrooms significantly affects the perceived usefulness of university students.*

The investigation of using games in teaching environments like foreign languages has reported various implications in the research. To articulate the primary learning curriculum for young learners, it should incorporate more games for them which can make acquaintance for students with their environment (Bakhsh, 2016). The students while gaining new instructions need to absorb the major learning requirement and instructions within a well-designed learning curriculum. Further the claims that stated the games should be an essential component and part of the primary education due to it could motivate, contextualize, and naturalize the activities which make the learning process meaningful (Whitton & Moseley, 2012). The games provide the academic staff and teachers with many benefits when they use this approach in the classroom, for example the advantages are the learners can be motivated to learn complicated subjects like foreign language when they are involved within a game. The results in this setting emphasized this issue through proposing that the games stimulate the student interests and properly introduce the games into the highest motivating technique (Sandford, Ulicsak, & Facer, 2006). A further argue that the games spur the motivation and students to get absorbed in the competitive aspect of the game. In other words, the game stimulates the students' interest within the classroom activities and as an outcome, therefore they have become more motivated and willing to learn and perceive these benefits. Thus, based on the above discussion the study postulates the following hypotheses.

**H<sub>10</sub>:** *Using games significantly affects the perceived enjoyment of university students.*

According to Nikhashemi et al. (2019), marketers are nowadays offering a pleasant and pleasant purchase experience to increase their intention to purchase consumers. According to Schmitt (1999), customer experiences are classified into five elements, one of which is the sensory experience (five senses). Marketers stimulate their five senses by motivational stimuli to increase their experiences (Altschwager et al., 2017). The other two elements include affective experience (feeling) and customer's cognitive experience (Schmitt, 1999). Feeling is the most primary level of conscious experience which might be a result. Cognitive experience is an innovative way for targeting consumer intelligence and awareness to create a different experience (Bustamante & Rubio, 2017). Schmitt (1999) has introduced behavioral experience and social experience as other aspects of customer experience. According to Bustamante & Rubio (2017), behavioral experiences are behavioral responses driven by brand-related stimuli. They include a part of design of a brand, identity, packaging, marketing communications, and the environment. Social experience means the aspect of social interactions and individual processes are part of the consumer experience, since they not only demand intrinsic performance benefits in interaction with other customers, but also seek social benefits and achieve a deep sense of social involvement in the sales environment. Providing diverse strategies and a combination of different experiences increases the consumers' purchase. According to Nikhashemi et al. (2019), marketers are nowadays offering a pleasant and pleasant purchase experience to increase their intention to purchase consumers. According to Schmitt (1999), customer experiences are classified into five elements, one of which is the sensory experience (five senses). Marketers stimulate their five senses by motivational stimuli to increase their experiences (Altschwager et al., 2017). The other two elements include affective experience (feeling) and customer's cognitive experience (Schmitt, 1999). Feeling is the most primary level of conscious experience which might be a result. Cognitive experience is an innovative way for targeting

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**H<sub>11</sub>:** *Using games significantly affects the perceived ease of use of university students.*

**H<sub>12</sub>:** *Using games significantly affects the perceived usefulness of university students.*

Problem-based learning PBL has worldwide implemented, the students in this approach can learn through a professional discussion that is relevant to actual problems and could enhance the knowledge application and integration. The assumption that encourages the students towards a deep teaching and learning method makes the students intrinsically to be more interested and try to better understand (Mok, Dodd, & Whitehill, 2009). PBL further is seen as a student-centered approach that is instructionally implemented at many worldwide universities. Among this method, the students discuss the issues in small groups. The issues are firstly discussed prior to any preparations or even a self-study may have taken a place to motivate the students' limited prior knowledge (Dolmans et al., 2016). The group discussions here are facilitated by academic staff and mainly aims to acquire more knowledge for better understanding and gain a skill of problem solving (Van Merriënboer and Kirschner, 2013). On the one hand, PBL actively engages the students in their own learning environment, and, on the other hand, it includes various scaffolds to develop their learning capacity like design problems carefully and the discussion in general facilitated by the staff (Merrill 2012). Designing the PBL process need a pre-discussion of the problems to activate the prior students' knowledge to formulate the learning issues, the approach self-study and report the procedures in which the literature results are addressed and discussed to align with the instructional design methods and emphasized the significance of learning through various means to encourage the integration of skills, knowledge, and attitudes (Hendry, Ryan, & Harris, 2003). Thus, based on the above discussion the study postulates the following hypotheses.

**H<sub>13</sub>:** *Using problem-based learning significantly affects the perceived enjoyment of university students.*

According to Nikhashemi et al. (2019), marketers are nowadays offering a pleasant and pleasant purchase experience to increase their intention to purchase consumers. According to Schmitt (1999), customer experiences are classified into five elements, one of which is the sensory experience (five senses). Marketers stimulate their five senses by motivational stimuli to increase their experiences (Altschwager et al., 2017). The other two elements include affective experience (feeling) and customer's cognitive experience (Schmitt, 1999). Feeling is the most primary level of conscious experience which might be a result. Cognitive experience is an innovative way for targeting consumer intelligence and awareness to create a different experience (Bustamante & Rubio, 2017). Schmitt (1999) has introduced behavioral experience and social experience as other aspects of customer experience. According to Bustamante & Rubio (2017), behavioral experiences are behavioral responses

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**H<sub>14</sub>:** *Using problem-based learning significantly affects the perceived ease of use of university students.*

**H<sub>15</sub>:** *Using problem-based learning significantly affects the perceived usefulness of university students.*

The discussion over the recent studies has reported that a wide range of the students expect their teachers to use a variety of innovative technological methods during the teaching process that include online learning tools particularly during the Coronavirus pandemic. Buzzard et al. (2011) stated that the younger individuals are the most active demographics which represent the most percentage of the blogging population. The given evidence suggested that usage of online tools develop the teaching and learning process in higher education context (Chen, Lai, & Ho 2015). The recent learning trends are expected to be continued in the next few years on a global scale. While few previous studies investigated the acceptance of the students to use online tools like blogs for learning in the higher education (Liu et al., 2012), and little empirical research have focused on the likely factors influence the continuance intention of the students to accept advance tools for learning purposes (Lai and Chen 2011). Focusing on important topics is ultimately pertinent due to the studies that indicated the students struggle to sustain deep engagement in using modern methods for learning. Similarly, the literature in this vein has indicated that the good teachers continue to maintain and explore new teaching mechanisms, Newland and Byles (2014) indicated that some teachers after perceiving the greater benefits and outcomes replace the traditional tools with the emerging developed ones. Therefore, exploring the students' intentions to online learning by using different teaching methods through a contextual perspective is still under developed and needs further discussion and investigation for new implications and future research



avenues. Empirical research of this topic is starting at the surface. The current work intends to contribute to the gaps of literature in this topic. Thus, based on the above discussion the study postulates the following hypotheses.

**H<sub>16</sub>:** *The perceived enjoyment significantly affects university students' intention to online learning.*

**H<sub>17</sub>:** *The perceived ease of use significantly affects university students' intention to online learning.*

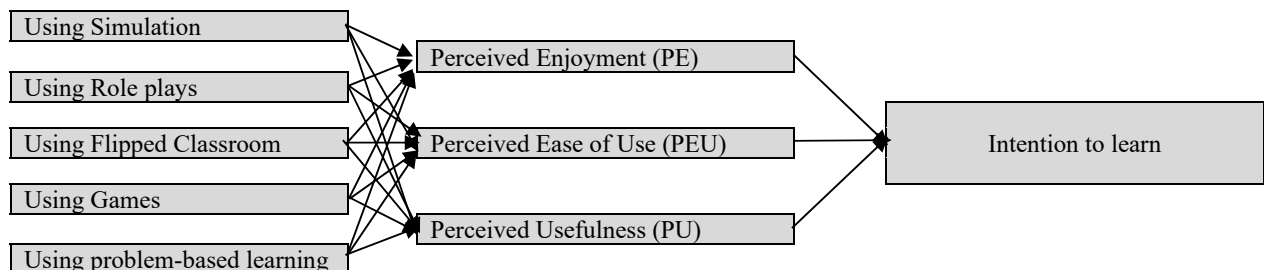
**H<sub>18</sub>:** *The perceived usefulness significantly affects university students' intention to online learning.*

### 3. Method

The present study is quantitative research in its nature and this approach is adopted in order to conduct this study and meet the main research objective. The study declared an interest to examine the sample perspectives of the university students about the influence of teaching methods used at universities affect the students' intention to online learning by employing the Technology Acceptance Model (TAM). However, the presented related discussions and the gaps existed in the relevant literature motivate this study to propose a conceptual research model as given in Figure 1, that presents sets of hypothesized proposed statements. The respective model further presents that the independent construct (teaching methods with five sub-variables) which assume have an effect and can predict the dependent variable (intention to online learning). Moreover, TAM dimensions are postulated to significantly impact the intention to online learning of university students. The target study sample included different university students in Jordan at both private and public universities over the kingdom with a total of 532 participants in this study. As a result of the main role of the diversity of teaching methods adopted at these universities, the demand of the students to integrate new advanced teaching methods to be aligned with the rapid changes in the education environment. The convenience sampling is appropriate to conduct this study and collect the required data and it is more likely in the studies with a large population to easily reach the adequate numbers of participants (Etikan & Bala, 2017).

The current research concerns involving the right sample to well represent the different sample backgrounds and this could enable acquiring diverse perspectives for research findings. As a study instrument, the study has adopted the survey questionnaire approach that was created for data collection purposes, and it has been reviewed among experts in the study topic. The measurements further have been adapted from the previous studies and literature and mostly the items have been validated to check the rightness of these items of measuring the respective constructs. The independent variable factors were measured by five dimensions namely: using simulation, using role plays, flipped classroom, using games, and using problem-based learning. The measurement is ranked by using a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree) all measurements are coded, and the study participants were asked to indicate their agreement or disagreement of the statements. The study used Partial Least Squares Structural Equation Modeling (PLS-SEM) approach for analysis purposes and conducted the key statistical analyses.

The suggestions of selecting this analytical approach come from the reliable results it may gain and the ability of this method to analyze many different variables over a single model with complex interrelationships between these variables. The empirical results of the studies recommend using this analysis generally in the social science studies due to the given validity and reliability provided from PLS-SEM software (Hair et al., 2019). Further, the PLS-SEM analysis can also offer sets of unique analyses which help the research to investigate the critical issues of the respective constructs and factors and give a clear idea about the ability of measurements to measure the target variables. However, the current study aims to examine and present two main common types of models called measurement model and structural model, the first model mainly utilized in this research to validate the model and examine measurement's reliability by using different types of validity e.g., convergent validity, meanwhile the second model utilized to test the hypothesized research model (Hair et al., 2017).



**Fig. 1.** Research Conceptual Model

### 4. Results

The research results are given and provided by the program of SmartPLS3 which in general widely suggested and recommended over many different social studies currently as a result of the advantageous outcomes. Therefore, this method provides important major statistical results that also help the studies to present good perspectives (Sarstedt et al., 2016). Furthermore, the current approach through the many analytical procedures and tests available in this program can enforce the research trends of examining many different factors at once over a one research model. The justifications behind selecting this analysis

are associated with the capacity to carry out essential important tests. The next sections present the two key models called measurement and structural model.

#### 4.1 Measurement model assessment

The measurement model basically sets important requirements that link to the validation of the study measurements in order to ensure the ability of these measurements to measure the target variables. The key tests of these procedures include conducting important tests (Hair et al., 2017). This phase of analysis require also illustrate common aspects that largely required to make a decision about the reliability of the measurements which include factor loadings of the study indicators that indicate the capacity to measure the target factors, examining these indicators need also check up their reliability through conducting a calculation of a commonly method used in this analysis namely Cronbach's Alpha, Average Variance Extracted AVE and Composite Reliability CR. These results provide the research with some important processes highly needed to check the indicators' reliability (Afthanorhan et al., 2020). Giving the variables reliability indicates the essential aspects of the analysis as well the validity which is sometimes called internal consistency. The researchers run this type of analysis to check the reliability through SmartPLS3 outputs. Table 1 presents the results of the measurement model that mostly have met satisfactory levels and exceed the minimum cut-offs. The convergent validity was calculated by both AVE and CR and the results revealed great outputs of this model. Also, the results indicated acceptable ranges of  $>0.50$  and  $>0.70$  respectively of the convergent validity (Fornell & Larcker, 1981). In addition, the results of the measurement model generally supported all suggested assumptions and confirmed the constructs' reliability and validity. The first initial run of the measurement model showed no poor lower factor loadings indicators ( $<0.70$ ) since the construct's validity and reliability are acceptable ( $>0.50$  and  $>0.70$ ).

**Table 1**  
Descriptive Statistics, Validity, & Reliability

Constructs	Items	Mean	SD	FL	Alpha	CR	AVE
Using simulation	Q1	3.99	0.84	0.73	0.73	0.84	0.64
	Q2	4.12	0.84	0.85			
	Q3	4.06	0.87	0.82			
Using role plays	Q4	3.96	0.92	0.82	0.74	0.85	0.65
	Q5	4.10	0.84	0.77			
	Q6	4.04	0.85	0.83			
Using flipped classroom	Q7	4.02	0.92	0.86	0.74	0.85	0.66
	Q8	4.04	0.84	0.80			
	Q9	4.12	0.89	0.76			
Using games	Q10	4.03	0.88	0.82	0.80	0.88	0.72
	Q11	4.09	0.83	0.86			
	Q12	4.06	0.88	0.85			
Using problem-based learning	Q13	3.88	0.88	0.86	0.80	0.88	0.71
	Q14	4.02	0.83	0.84			
	Q15	3.97	0.88	0.83			
Perceived enjoyment	Q16	4.08	0.84	0.86	0.80	0.88	0.72
	Q17	4.07	0.86	0.84			
	Q18	3.91	0.89	0.84			
Perceived ease of use	Q19	3.87	0.92	0.77	0.70	0.83	0.63
	Q20	4.05	0.87	0.78			
	Q21	4.13	0.86	0.82			
Perceived usefulness	Q22	4.11	0.87	0.74	0.65	0.81	0.59
	Q23	4.16	0.70	0.81			
	Q24	3.98	0.83	0.74			
Intention to online learning	Q25	4.01	0.72	0.84	0.80	0.87	0.62
	Q26	3.99	0.82	0.79			
	Q27	3.99	0.75	0.74			
	Q28	4.01	0.73	0.77			

The present study also interests with checking the issues of validity with using another required type of validity namely discriminant validity, which is largely used to assess and check if the variables have a high multicollinearity issue. (Henseler et al., 2015) indicated that a procedure generally used to check this validity is the approach of cross-loadings. The research provided the important needed outputs like Fornell-Larcker and Heterotrait-Monotrait (HTMT) which means the correlations among the variables as presented in Table 2 and Table 3. The results are also calculated by using the square root the AVE and they illustrated in the bold off-diagonal cells that explained more than the variables correlations itself (Fornell & Larcker, 1981). Further, the results of the measurement model showed good outputs of the discriminant validity, thus the current research involved the HTMT analysis as an important analysis process in order to evaluate this type of validity. The findings of the HTMT achieved a good threshold of ( $\leq 0.90$ ) hence, this meets the key analysis of the discriminant validity of HTMT  $\leq 0.90$  (Kline, 2015), and showed a satisfactory validity for study variables.

**Table 2**  
Fornell-Larcker Criterion

Variables	1	2	3	4	5	6	7	8	9
1 Intention to online learning	<b>0.790</b>								
2 Perceived ease of use	0.393	<b>0.795</b>							
3 Perceived enjoyment	0.269	0.738	<b>0.848</b>						
4 Perceived usefulness	0.636	0.560	0.444	<b>0.768</b>					
5 Using problem based learning	0.411	0.626	0.648	0.406	<b>0.847</b>				
6 Using flipped classroom	0.268	0.607	0.557	0.403	0.591	<b>0.813</b>			
7 Using games	0.408	0.608	0.547	0.468	0.617	0.640	<b>0.848</b>		
8 Using role plays	0.358	0.608	0.561	0.440	0.518	0.674	0.548	<b>0.811</b>	
9 Using simulation	0.285	0.526	0.510	0.405	0.507	0.663	0.518	0.624	<b>806</b>

**Table 3**  
Heterotrait-Monotrait (HTMT) Ratio

Variables	1	2	3	4	5	6	7	8	9
1 Intention to online learning									
2 Perceived ease of use	0.517								
3 Perceived enjoyment	0.336	0.878							
4 Perceived usefulness	0.872	0.825	0.614						
5 Using problem based learning	0.516	0.830	0.805	0.561					
6 Using flipped classroom	0.342	0.829	0.711	0.576	0.752				
7 Using games	0.500	0.804	0.679	0.649	0.767	0.816			
8 Using role plays	0.464	0.836	0.724	0.628	0.677	0.820	0.713		
9 Using simulation	0.357	0.721	0.644	0.581	0.649	0.899	0.666	0.847	

4.2 Structural model assessment

Examining the structural model is the next step of PLS-SEM analysis after assessing the whole measurement model. The procedure of structural model assessment is generally conducted for scholarly suggestions in this setting that considers significant analysis aspects to test the stated research hypotheses. Hair et al. (2017) stated this phase of analysis is an important analysis process to get the key results and make a judgment about the model goodness. The research here depends on the main common findings mainly utilized in this analysis like path estimates, corresponding t-value as well p-value to make a clear decision of the analysis that significantly represents the structural model analysis through the approach of bootstrapping as given in Fig. 2. The obtained direct effects results presented in Table 4 revealed that the most of different teaching methods (using simulation, using role plays, using flipped classroom, using games, and using problem-based learning) had a significant effect on TAM dimensions, and these dimensions had a significant effect on intention to online learning ( $p < 0.05$ ), so the results have supported all stated research hypotheses.

**Table 4**  
Hypotheses Testing

Hypotheses	Beta	T-value	P-value	Result
<b>H1</b> Using simulation → perceived enjoyment	0.169	2.269	0.005	Supported
<b>H2</b> Using simulation → perceived ease of use	0.152	2.993	0.002	Supported
<b>H3</b> Using simulation → perceived usefulness	0.120	2.082	0.038	Supported
<b>H4</b> Using role plays → perceived enjoyment	0.206	4.067	0.000	Supported
<b>H5</b> Using role plays → perceived ease of use	0.242	4.361	0.000	Supported
<b>H6</b> Using role plays → perceived usefulness	0.192	3.553	0.000	Supported
<b>H7</b> Using flipped classroom → perceived enjoyment	0.166	2.061	0.007	Supported
<b>H8</b> Using flipped classroom → perceived ease of use	0.113	2.882	0.001	Supported
<b>H9</b> Using flipped classroom → perceived usefulness	0.134	1.995	0.048	Supported
<b>H10</b> Using games → perceived enjoyment	0.111	4.054	0.000	Supported
<b>H11</b> Using games → perceived ease of use	0.201	3.833	0.000	Supported
<b>H12</b> Using games → perceived usefulness	0.256	4.403	0.000	Supported
<b>H13</b> Using problem-based learning → perceived enjoyment	0.399	7.913	0.000	Supported
<b>H14</b> Using problem-based learning → perceived ease of use	0.283	3.376	0.000	Supported
<b>H15</b> Using problem-based learning → perceived usefulness	0.108	3.973	0.000	Supported
<b>H16</b> Perceived enjoyment → intention to online learning	0.187	2.260	0.000	Supported
<b>H17</b> Perceived ease of use → intention to online learning	0.114	3.731	0.000	Supported
<b>H18</b> Perceived usefulness → intention to online learning	0.611	13.622	0.000	Supported
R2 for intention to online learning			0.410	
Q2 for intention to online learning			0.247	

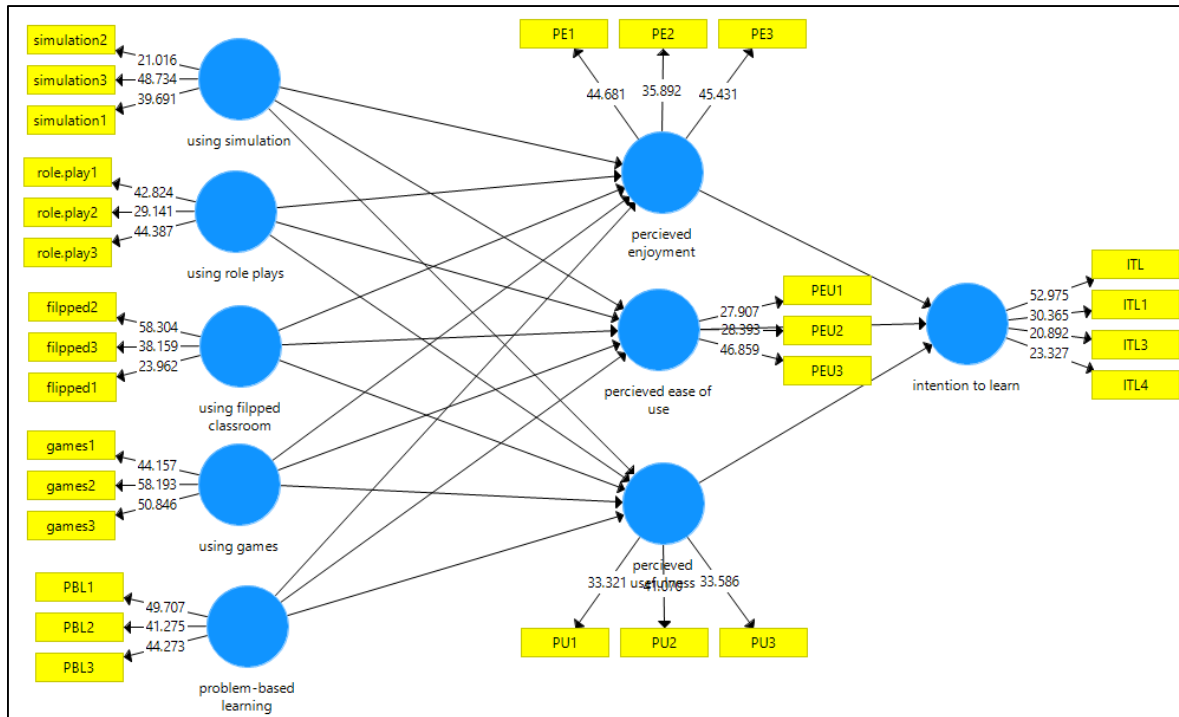


Fig. 2. Structural Research Model

The significant tests were stated by international statisticians e.g. Hair et al. (2017) which importantly to be involved and examined over the empirical research and they mostly linked with the variance that explained at the dependent variable and often called coefficient of determination ( $R^2$ ) and the cross-validated redundancy ( $Q^2$ ) which significantly to assess and indicate how the model has a quality of prediction. The results of the structural model explained 41% of the variance in intention to online learning. Since the results have ranged from 0 to 1, the structural model data as well confirmed a good explanatory power (Shmueli et al., 2019). To assert the model goodness of the model predictability, the current research also tested the predictive value of  $Q^2$  of the dependent (endogenous) construct which should be more than zero to confirm this analysis, the results of this test as given in Table 4 supported the agreed research assumption with more than zero.

## 5. Discussion

The study's aim is to address the several teaching methods at universities in Jordan on students' intention to online learning through the TAM. The results found that the students' behavioral intentions to use online learning through new modern learning tools like websites. In the current research, the findings supported the TAM dimensions of perceived enjoyment, perceived ease of use, and perceived usefulness has a positive and direct effect on the behavioral intention of the students at universities to use online learning. In different words, the higher the enjoyment and usefulness of using online learning methods, the higher the behavioral intention to use online learning, and a higher ease of use also increases the behavioral intention of the students at universities to use online learning. Mostly all research hypotheses were supported and confirmed a significant effect of the stated hypothesized model. These results in general stand in line with Scherer and others' (2019) study results. The current research further found that the involved factors of teaching methods had a positive effect on all TAM dimensions. This is to state, the university students think that diversity of teaching methods and the benefits possibly gained of these methods like perceived enjoyment or usefulness would result in a higher intention of employing online learning.

In the same vein, the findings are consistent with the literature trends and results which supported the importance of TAM among integrating advanced modern learning approaches and tools to meet the growing expectation of the learners particularly over the emerging global situations and events like COVID-19 pandemic which largely encourage digital educational transformation. Moreover, the discussion in this topic underpinned the research results and showed that perceived outcomes increase the intention and demands to involve within untraditional interesting learning policies and strategies which call the university to seriously incorporate unique educational regulations. These findings match with what Ifinedo et al. (2018) supported in their research about the perceived outcomes of using modern tools like moodle in a blended learning environment. Furthermore, the current study revealed that the quality of the educational systems will be developed while greater recognition of the positive effects of diversification of teaching methods on the students' intention to online learning. The results in this context match with the findings of Bagozzi (2007) research who addressed the legacy of the technology acceptance through a proposal within the paradigm shifts. On other hand, this finding coincides with the research conclusion of Zulfiqar et al (2018) that used the simulation system for collaborative learning which improved the learner's performance. Addressing the

hybrid TAM as a theoretical framework supported this study to predict how students could respond to the online learning to increase their acceptance and improve the teaching processes.

The results indicated that the students' intention to participate in online learning is influenced by the nature of the methods provided within their learning classes and the experiences during online learning form the attitudes towards this learning, as well as building a positive learning environment. In line with these results, the university students' willingness to accept online learning is also influenced by the diversification of incorporating numerous teaching methods including using simulation, games, role plays...etc. The students on other hand tend to prioritize a higher online learning frequency, able to sustain good interaction and communicate properly with each other and with their tutors. It looks that the students' perceptions of the learning sustainability could create a better class communication that includes immediate responses. The previous studies also indicated that the comprehension and interactions through online discussions positively and strongly would contribute to stimulation of cognitive learning and this impact the students' academic performance. In line with the discussions of the Kemp et al (2019) study about the students' perceptions toward the online learning benefits like communication flexibility and managing classes schedules, it revealed a positive influence of the preference to invest more to conduct online learning lectures. While many both intrinsic and extrinsic motivations like these benefits which drive positively the students' intention to accept technological applications within their online classes which might influence their performance.

The online learning environment from a university perspective under the education management generally represents the advantageous benefits toward the turning points of promoting online learning development. The stated research factors consisted of problem-based learning, flipped classroom, games and others coincided with the belief that these factors were positive motivation for students' intention to switch from offline education into online learning. Therefore, when their experience of these factors is formed by other required factors like service quality and convenience of online learning during the tough situations like the known pandemic of COVID-19, they select not to physically attend the classrooms. In general, the inconvenience of communication during this situation resulted in a control process over many higher institutions due to this pandemic and was a main factor contributing to the students' intention to switch to online learning. The findings are consistent with the trends in the literature about academic staffs' perceptions of the factors that produce motivational factors which could cause the students to leave the offline teaching approach (Cheng et al., 2019). Further, due to the shifting among the students, realization of the concerns about their higher education institutions' lack of the advanced measures of conducting offline classes made the students prefer switching into online classes. In the end, the outcomes come from increasing the education system quality, which could be an additional result and factor that also matches with the previous studies findings which discussed online learning (Chen & Keng, 2019).

## 6. Implications

This research provided implications and had some limitations that should be acknowledged. First, although TAM has been examined in both developed and developing contexts with no works conceptualizing an integrative model with various important factors through TAM. Most of those who participated in the current study were university not school students. In other words, most of the participants had studied at science faculties and were involved in this study which triggered a need to explore the students of social and humanitarian majors. This would raise possible research issues in the future studies which should address methods and ways to encourage the university students to participate in such research.

Second, the current study focused on the context of intention to online learning as a modern teaching method of the university students in the digital community. Most of the responses were higher homogeneity, thus this study did not analyze their demographics. In the future, a suggestion of selecting schools and classifying their profiles in terms of different demographics like gender, educational backgrounds. Thus, it could enable us to make a comparison and study the differences.

Third, the proposed conceptual framework includes nine constructs and adopted TAM for the participants to participate in this research. In the future, to improve the research model, it could compile the online learning experience and participants' portfolios by adding further research objectives and methods. For example, it suggests extracting the number of learning hours and interaction frequency with colleagues or tutors and score the learning from sample profiles in the data. The study contributes to the existing body of the literature in terms of explaining the intentions of students towards the online learning community. This would encourage the future studies to start with the literature gaps and limitations to cover these gaps and offer more research implication would help the practitioners in the higher education industry to design advanced educational policies and strategies to cope with the global changes in this context and enrich the found practices and experiences to reduce research constraints. Furthermore, the academic staff at university through the research findings might ask the learners to join discussions on the same issues to observe their communication during the online session to evaluate their learning performance and identify the motivational factors to motivate the learners to be involved within different learning activities.

## 7. Conclusion

With the respect to the factors that affect the university student's intention to online learning, all the research hypotheses were supported. The structural model showed that all path coefficients were found to have a statistically significant and positive

effect, also the dimensions of TAM with the intention of online learning. The results revealed that all different teaching methods possible used at university e.g simulation, role plays...etc had a significant effect on students' attitudes toward using online learning. Moreover, these results matched with the relevant literature and empirical studies which confirmed this relationship. The current study through these results provide further understanding of the role of people's attitudes toward new experience of using online learning and the associated technologies. Similarly, this would also confirm the key role of the behavioral intention to play with using online learning. It could be noted that TAM and theories of behavioral and attitudes through their respective model addressed the employment of this model among the recent studies for further better grasp of this subject. On other hand, the findings of this study related to the predictive power of the TAM was moderate ( $R^2 = 0.410$ ). A few latent factors would be able to explain high variance in the intention to online learning.

To researchers' knowledge, this study is the first to empirically examine the various teaching methods associated with TAM dimensions of the university students' intention to online learning. Overall, this research validated the TAM factors as well signified the importance of the attitudes toward students' acceptance of online learning. These findings, however, could possibly provide critical research insights to the higher education institutions like universities that currently use online education and those that will implement online learning in the near future. Investigating the factors that impact the university students' acceptance of online learning is crucial for greater evolution and success. The issue of online learning acceptance by the students would deepen their interests once numerous benefits were perceived of accepting online learning such as useful, user-friendly, and less time consuming. In fact, this also results in students' perceptions of online learning, and subsequently solidifies their efforts for further engagement in online learning classes. A practical viewpoint, the universities can use these findings to expand understanding the extent to which university students communicate with and learn through online learning methods. Understanding integrating different teaching methods can also help in promoting a deeper learning experience as a critical factor to improve the learning process.

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