



Factors affecting trainee teachers' intention to use technology: A structural equation modeling approach

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Abstract

It is becoming necessary for trainee teachers to willingly accept technology as a tool for learning, effective teaching and assessment. The aim of this study is to measure trainee teachers' perceived usefulness, perceived ease of use, subjective norm, facilitating conditions, attitude towards technology use and behavioural intention to use technology. Data was collected from 203 trainee teachers in Bahrain. We employed structural equation approach to analyse the relationships among the factors affecting trainee teachers' intention to use technology. Results from structural equation modeling analyses suggested that perceived ease of use was a moderate predictor of perceived usefulness and attitude towards use and perceived usefulness was a strong predictor of behavioural intention to use technology. However, subjective norm and attitude towards technology use were not found significantly associated with behavioural intention to use technology. This study has contributed to the growing body of studies on the technology acceptance model and it is the first study in the Kingdom of Bahrain that has explored trainee teachers' intention to use technology.

Keywords Computer technology · Structural equation modeling · Technology acceptance model · Trainee teachers

1 Introduction

Researchers have conducted numerous research projects to examine the impact of technology on learning, and the enhanced learning environment technology

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provides in the classroom (Jhurree 2005). There is convincing evidence that information, communication, and technology (ICT) if adequately integrated into education, has the potential to enhance the teaching and learning process (Ghavifekr et al. 2014; Ghavifekr and Rosdy 2015; Peat and Franklin 2003). In a case study, Harris (2002) found evidence to suggest that the benefits of ICT will gain when confident teachers are willing to explore new opportunities for changing their classroom practices by using ICT.

We conducted this study in the Kingdom of Bahrain, located in a central position in the Gulf; the archipelago of Bahrain consists of 35 islands. It has a total area of approximately 780 km². Out of the thirty-five islands, only six are inhabited, with most of the population residing on the two main islands (Bahrain and Muharraq). Bahrain is located just off the shoreline of Saudi Arabia to the west, and Qatar to the east in the Arabian Gulf (Al-Arrayed 1987). Manama is the capital and largest city of Bahrain.

With the development in Bahrain, leading to the emergence of economic globalization which poses challenges to the values and traditions, a comprehensive economic vision-*Vision 2030*- was developed to provide Bahrain with clear directions for reforms of many of its sectors, including education (Razzak 2015). According to Anderson (2010) and Razzak (2015), the future of Bahrain's economy and the prosperity of its citizens are strongly correlated with the integration of ICT in almost every aspect of life. In line with Bahrain *Vision 2030*, the ministry of education (MOE) in Bahrain has been adopting several programs that would help increase schools' effectiveness (Razzak 2016). Among these programs is the integration of ICT. According to Sang et al. (2011), support of government and ministry of education policy may not make sure of teachers' use of technology. Teachers play a significant role in ensuring that technology is embraced and adequately executed in teaching (Teo 2009). However, technology use in the classroom is still a universal problem (Becker 2001; Teo 2009). For example, a study conducted by Becker (2001) revealed that teachers in the United States had used computer barely for only games and drills in the classroom. According to Jones (2004), in the United Kingdom, some of the barriers to the effective integration of technology in teaching and learning is the lack of technical support, teacher's lack of confidence, and lack of realization of the advantages of using technology in their lesson. Birch and Burnett (2009) mentioned a lack of clear institutional direction concerning course design and the delivery time as significant inhibitors to the development of e-learning environments among Australian academics. Lim and Khine (2006) found that Singapore teachers' use of technology in the classrooms remained minimal and that teachers do not use technology effectively.

We undertook this study in the hope that establishing trainee teachers' intention to use technology and promoting the usefulness of incorporating technology in their teaching would have some implications for realizing the goals of Bahrain's *Vision 2030*.

2 Conceptual framework

The technology acceptance model (TAM) based on the theory of reasoned action (TRA) explain the user's acceptable behaviour. TAM was adopted to improve the user's perception of technology and the intention to use technology (Cheung and Vogel

2013; Teo et al. 2008). Davis, in Davis 1989, used TAM to explain computer usage behaviour. The goal was to describe the general determinants of computer acceptance that lead to explaining users' behaviour across a broad range of end-user computing technologies and user populations (Lai 2017). The basic TAM model included and tested two specific beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEU). Perceived usefulness is the potential user's subjective likelihood of the use of a particular system. Example, single platform e-payment system, will improve his/her action and Perceived Ease of Use refers to the degree to which the potential user expects the target system to be effortless (Davis 1989). The belief of the person towards an order may influence by other factors referred to as external variables in TAM (Lai 2017).

Venkatesh and Davis (1996) developed the final version of TAM after the main findings of both perceived usefulness and perceived ease of use were found to have a direct influence on behaviour intention, thus eliminating the need for the attitude construct (Lai 2017). Venkatesh and Davis (2000) proposed the Technology Acceptance Model 2 (TAM 2) which theorizes that users' mental assessment of the match between important goals at work and the consequences of performing job tasks using the system serves as a basis for forming perceptions regarding the usefulness of the system. Venkatesh and Bala (2008) developed an integrated model of technology acceptance known as TAM 3 by combining TAM 2 (Venkatesh and Davis 2000) and the model of the determinants of perceived ease of use (Venkatesh 2000). The authors developed the TAM 3 using the four different types, including the individual differences, system characteristics, social influence, and facilitating conditions which are determinants of perceived usefulness and perceived ease of use.

In the year 2003, the unified theory of acceptance and use of technology (UTAUT) model was developed by Venkatesh et al. (2003) to explain user intentions to use an information system and subsequent usage behaviour. Venkatesh et al. (2003) reviewed studies involving eight models:

1. Theory of reasoned action (Fishbein and Ajzen 1975),
2. TAM (Davis 1989),
3. Motivational model (Davis et al. 1992),
4. Theory of planned behaviour (Ajzen 1991),
5. A combined approach of planned behaviour/TAM (Taylor and Todd 1995),
6. Model of PC utilization (Thompson et al. 1991),
7. Innovation diffusion theory (Moore and Benbasat 1991), and
8. Social cognitive theory (Compeau and Higgins 1995)

that explains user acceptance of new technology.

One of the most popular models, TAM, designed by Davis (1989), is efficient in addressing the issue of how users come to accept and use technology. TAM was a derivation of Fishbein and Ajzen's (1975) theory of reasoned action (TRA) that describes how user beliefs and attitudes are related to an individual's intention to perform. According to Teo (2011), TAM specifies the relationships among perceived usefulness, perceived ease of use, attitude towards technology use, and behavioural intention to use technology. Over the years, TAM has received empirical support in diverse contexts (e.g., education) and across different technological tools (Al-Emran et al. 2018; Teo 2009; Teo et al. 2019).

Ma and Liu (2004) conducted a meta-analysis based on 26 selected empirical studies to synthesize empirical evidence. The results of their study confirmed Davis' (1989) original findings that indicated a strong relationship between PEU and PU, and between PU and technology acceptance (TA). However, they found that the relationship between PEU and TA was weak. In another meta-analysis, King and He (2006) reviewed 88 TAM studies. The study found that PU and behavioural intention (BI) were highly reliable to use in various contexts. The authors noted that participants of these studies were often students used as convenience samples, and they argued that studies that involve actual users in work environments might be necessary to test effects. The results of King and He's (2006) meta-analysis have shown TAM to be a powerful and robust and widely used predictive model (Bertrand and Bouchard 2008).

Schepers and Wetzels (2007) conducted another meta-analysis of the TAM and investigated the subjective norms and moderation effects. They analyzed 51 articles using a conceptual model that characterized subjective norm, PU, PEU, attitude towards use, behavioural intention to use (ITU) and actual system use. They compared TAM results by considering the moderating effects of one individual-related factor (a type of respondent), one technology-related factor (a type of technology) and one contingent factor. The results of their study indicated a significant association of subjective norm with PU and behavioural ITU.

2.1 Perceived usefulness (PU)

PU refers to the extent to which a person believes that using technology will enhance his or her job performance (Davis 1989). According to Philips et al. (1994), PU is indicative of the prospective users' subjective probability that using technology would be beneficial to his/her well-being and the adopting organisation's well-being. A study by Teo (2011) that developed and tested a model to explained schoolteachers' intention to use technology revealed that perceived usefulness, attitude towards technology use, and facilitating conditions have direct influences on behavioural intention to use technology.

2.2 Attitude towards technology use (ATU)

According to Davis et al. (1989), an attitude refers to the extent to which a person possesses positive feelings about using technology. A person's attitude towards the use of technology is essential to the successful use of technology in education (Huang and Liaw 2005). Results of previous studies have provided evidence that educational institutions that provide easy access to computers could promote a positive attitude towards the use of computers (Mitra and Steffensmeier 2000; Teo 2009). Research conducted previously has found perceived usefulness and perceived ease of use to significantly influence attitude (Teo 2009, 2011; Pynoo and van Braak 2014).

2.3 Behavioural intention to use technology (BIU)

Behavioural intention to use technology is a factor that describes how hard people are willing to try to perform a behaviour (Ajzen 1991). Past research has shown a

statistically significant relationship between ATU and BIU (Chang and Wang 2008; Lin 2007; Liu et al. 2009; Wu and Chen 2005).

2.4 Perceived ease of use (PEU)

PEU is the extent to which a user believes that using technology would be relatively free of effort (Davis 1989). Previous studies have shown that when users perceive technology to be relatively easy to use (Davis et al. 1989; Venkatesh et al. 2003), they are likely to develop a positive attitude towards its use (Teo et al. 2009). Therefore, educational technology with a high level of PEU is more likely to promote a positive attitude towards technology (Teo 2009; Moon and Kim 2001). Studies have also supported that in the relationship between perceived usefulness and perceived ease of use, PU would mediate the relations of PEU with an attitude towards technology use (ATU).

2.5 Facilitating conditions (FC)

Taylor and Todd (1995) referred to facilitating conditions as a person's perceived availability of support in the environment, such as access to skills training, availability of information or materials, and administrative support that encourages and facilitates technology acceptance. Lim and Khine (2006) found that poor facilitating conditions (e.g., a lack of access to computers; inadequate technical support) were barriers to technology integration in the classroom. A study by Teo and Van Schaik (2009) revealed that facilitating conditions affected the perceived ease of use. Venkatesh (2000) and Mathieson et al. (2001), in the extending technology acceptance model with a construct of facilitating conditions, concluded that this construct has a positive influence on PEU.

2.6 Subjective norm (SN)

According to Ajzen (1991), subjective norms are an individual's perception of other people's views and thoughts on the suggested behaviour. These perceptions can play an influential role and put pressure on an individual to act, such as the intention to use technology. A study by Teo (2011) involving 592 schoolteachers from schools in Singapore found that subjective norms had a significant influence on perceived usefulness.

3 Research model and hypotheses

We present the proposed research model for our study in Fig. 1, based on both theory and past research (e.g. Teo 2011). The model hypothesises the following:

- H1: Facilitating conditions will be significantly related to perceived ease of use.
- H2: Perceived ease of use will be significantly related to perceived usefulness.
- H3: Subjective norm will be significantly related to perceived usefulness.
- H4: Perceived usefulness will be significantly related to attitude towards use.

- H5: Perceived ease of use will be significantly related to attitude towards use.
- H6: Subjective norm will be significantly related to behavioural intention to use.
- H7: Facilitating conditions will be significantly related to behavioural intention to use.
- H8: Attitude towards use will be significantly related to behavioural intention to use.
- H9: Perceived usefulness will be significantly related to behavioural intention to use.

4 Methods

We describe the research methods used in this study, including the sample, instruments used to collect data and the data analysis in this section.

4.1 Sample

We conducted the current study in the spring of 2019, at a teacher’s College in the Kingdom of Bahrain. The educational system in the kingdom of Bahrain includes nine years of basic education (primary and intermediate stages) and three years of secondary education. The primary stage consists of children from 6 to 11 years old. It comprised of two cycles of 3 grades each, that is, Lower Primary and Upper Primary. The intermediate stage consists of children from 12 to 14-year-old. The curriculum, at this level, stretches up to 3 years. The secondary stage prepares students to join Universities, Higher Education Institutes and Technical Education, which helps them to earn a livelihood for themselves. Children of 15 to 17 years of age study at this stage.

Bahrain Teachers College (BTC), affiliated with the University of Bahrain, is responsible for all teacher preparation and academically based in-service teacher

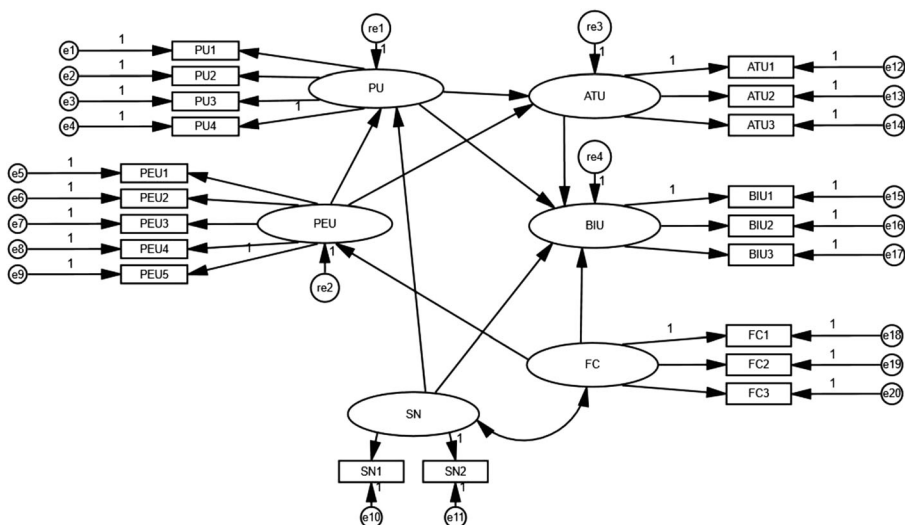


Fig. 1 Research model. Source: Adapted from Teo (2011)

professional development in the Kingdom of Bahrain. The College offers undergraduate and postgraduate programs, as well as professional development for in-service educators, with the commitment to provide leadership in the modernization of Bahrain's educational system. The language of instruction at BTC is English and Arabic.

The researchers used convenience sampling to select the participants because of geographical proximity, easy accessibility and availability at a given time, as well as willingness to participate (Etikan et al. 2016). All the participants were year one students at the Bahrain Teacher's College and were preparing for careers in primary school teaching. They took an ICT course taught by the researchers in the Spring of 2019.

The sample for our study involved ten classes containing a total of 203 students: 83.7% were female ($N=170$), and 16.3% were male ($N=33$). The participants' ages ranged between 19 years and 21 years. Because all 203 participants returned a fully completed questionnaire, there were no missing data.

4.2 Instruments

The first section of the self-report instrument used for this study gathered demographic information of the participants. In the second section, participants responded to 20 items underlying six main factors, designed to measure trainee teachers' intentions to use technology. Perceived usefulness (PU) was measured using four items, adapted from Davis (1989). Perceived ease of use (PEU) was measured using five items adapted from Davis (1989). Attitude towards use (ATU, three items) adapted from Fishbein and Ajzen (1975), behaviour intention to use (BIU, three items) adapted from Davis (1989), subjective norm (SN) was measured using two items adapted from Fishbein and Ajzen (1989). Finally, facilitating conditions (FC, three items) was adapted from Thompson et al. (1991). Researchers have validated the TAM in diverse contexts, including the United Arab Emirates in previous studies (e.g., Afari and Khine 2016). Table 1 shows the description and sample item for each scale. The participants were asked to indicate the extent to which they disagree or agree with the given statements by checking the appropriate number on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

We used a questionnaire initially developed in English for our study. Even though the participants all spoke English as a second language, an Arabic translation still was created for those participants who were more comfortable with responding in Arabic. As recommended by Ercikan (1998) and Warwick and Osherson (1973), all the items were translated into Arabic using the standard research methodology of translation, back translation, verification, and modification. Each item was translated into Arabic by a professional translator and instructor from our college. The next step involved an independent back translation of the Arabic version into English by another professional translator and instructor from the same college, who was not involved in the original translation, as recommended by Brislin (1970). We compared the items in the original English version and the back-translated version to ensure that the Arabic version maintained the meanings and concepts of the original.

Table 1 Descriptions and sample item for each scale

| Scale | Description | Sample item |
|------------------------------------|---|---|
| Perceived usefulness (PU) | The degree to which a trainee teacher believes that using technology would enhance his or her job performance. | Using technology enhances my effectiveness. |
| Perceived ease of use (PEU) | The degree to which a trainee teacher believes that using technology would be free of effort. | I find technology easy to use. |
| Subjective norm (SN) | The extent to which a trainee teacher perceives that most people who are important to him think he should or should not use technology. | People who influence my behaviour think that I should use technology. |
| Facilitating conditions (FC) | The extent to which a trainee teacher believes that factors in the environment influence his or her decision to use technology. | When I encounter difficulties in using technology, I know where to seek assistance. |
| Attitude towards use (ATU) | The extent to which a trainee teacher possesses positive feelings about using technology. | I look forward to those aspects of my job that require the use of technology. |
| Behavioural intention to use (BIU) | The degree of a trainee teacher's willingness to use technology. | I intend to continue to use technology in the future. |

Teo (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers & Education*, 57, 2432–2440

5 Data analysis

We used Cronbach's alpha reliability analysis to examine the internal consistency of the factors of the instrument. We used confirmatory factor analysis (CFA) to assess the measurement properties. Convergent validity determines whether scores on items assessing a single construct are strongly intercorrelated and measure the same underlying dimension (Schumacker and Lomax 2016). We examined construct validity using the standardized regression weights of measurement items, composite reliability (CR) and average variance extracted (AVE). Discriminant validity assesses the degree to which the constructs are empirically different. As suggested by Barclay et al. (1995), the criterion of discriminant validity was that the square root of the average variance extracted (AVE) for each construct must be larger than the inter-construct correlation.

The assessment of the research model using SEM was the next stage of the analysis. As suggested by Kline (2010), we evaluated model fit by the comparative fit index (CFI), Tucker-Lewis index (TLI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). Finally, we tested the hypotheses outlined in the research model. The path coefficients, whether they were positive or negative, and the magnitudes of the hypothetical relationships, were calculated. The purpose was to determine which variables were significantly related to the research model.

We explored the relationships among variables using structural equation modeling (SEM), with maximum likelihood estimation, using Analysis of Moment Structure (AMOS) version 25 software. In this study, we employed SEM because it allows simultaneous analysis for assessing the relationships among variables and errors for

each variable to be independently estimated (Kline 2010). It also allows the use of several indicator variables per construct simultaneously, which leads to more valid conclusions at the construct level than can be achieved using the traditional regression technique (Teo 2009).

5.1 Descriptive statistics

Table 2 shows the descriptive statistics of all the constructs. All the mean scores were above the mid-point of 3.0, ranging from 3.29 to 4.25, and indicated an overall positive response to the constructs. The standard deviations for all the constructs were less than one, ranging from 0.64 to 0.94, indicating that the item scores were spread narrowly around the mean.

As recommended by Teo and Lee (2012), because maximum likelihood estimation assumes multivariate normality of the observed variables, the data were examined for univariate and multivariate normality. The skewness index ranged from -0.99 to 0.02 and kurtosis index ranged from -0.68 to 1.42 , supporting the univariate normality for the items (Kline 2010). A measure of multivariate normality (Mardia's coefficient) was 76.68 , which is less than the recommended value (Raykov and Marcoulides 2008). Hence, the requirement of multivariate normality was satisfied.

6 Results

6.1 Measurement model

We used confirmatory factor analysis (CFA) to assess the measurement model. CFA was conducted with AMOS 25.0 (Arbuckle 2017) using maximum likelihood estimation (MLE) procedure. As recommended by Schumacker and Lomax (2016), all the standardized factor loadings should be higher than $.60$. As seen in Table 3, the standardized factor loadings ranged from $.61$ to $.92$. Also, the internal reliability of each of the construct was good with the Cronbach alphas ranging from $.71$ to $.82$ (DeVellis 2012). The suggested minimum value of the average variance extracted (AVE) for each factor is $.5$ (Fornell and Larcker 1981; Nunnally and Bernstein 1994). Table 3 shows that the average variance extracted (AVE) ranged from $.51$ to $.66$. The

Table 2 Results of the Descriptive statistics

| Construct | Item | Mean | Standard deviation | Skewness | Kurtosis |
|------------------------------------|------|------|--------------------|----------|----------|
| Perceived usefulness (PU) | 4 | 3.82 | 0.73 | -0.28 | -0.67 |
| Perceived ease of use (PEU) | 5 | 3.56 | 0.64 | 0.02 | -0.44 |
| Attitude towards Use (ATU) | 3 | 3.41 | 0.88 | -0.13 | -0.55 |
| Behavioural intention to use (BIU) | 3 | 4.25 | 0.72 | -0.99 | 1.42 |
| Subjective norm (SN) | 2 | 3.29 | 0.94 | -0.10 | -0.28 |
| Facilitating conditions (FC) | 3 | 3.61 | 0.84 | -0.15 | -0.68 |

Table 3 Results of confirmatory factor analysis ($n = 203$)

| Construct | Measurement variable | Standardized factor loading | CA | CR | AVE |
|------------------------------|----------------------|-----------------------------|-----|-----|-----|
| Perceived usefulness | PU2 | .73 | .71 | .78 | .54 |
| | PU3 | .79 | | | |
| | PU4 | .69 | | | |
| Perceived ease of use | PEU1 | .77 | .75 | .84 | .51 |
| | PEU2 | .69 | | | |
| | PEU3 | .65 | | | |
| | PEU4 | .61 | | | |
| | PEU5 | .82 | | | |
| Subjective norm | SN1 | .69 | .82 | .79 | .66 |
| | SN2 | .92 | | | |
| Facilitating conditions | FC1 | .67 | .77 | .76 | .52 |
| | FC2 | .73 | | | |
| | FC3 | .75 | | | |
| Attitude towards use | ATU1 | .61 | .75 | .75 | .61 |
| | ATU2 | .92 | | | |
| Behavioural intention to use | BIU1 | .79 | .81 | .81 | .59 |
| | BIU2 | .83 | | | |
| | BIU3 | .68 | | | |

Composite reliability (CR) is computed by $(\sum\lambda)^2 / (\sum\lambda)^2 + \sum(1 - \lambda^2)$; Average variance extracted (AVE) is computed by $\sum\lambda^2 / \sum\lambda^2 + \sum(1 - \lambda^2)$, where λ = standardized factor loading; CA: Cronbach's alpha

composite reliability (CR) of each construct was higher than .70, reflecting adequate reliability, as recommended by Nunnally and Bernstein (1994).

The results of the model fit, as shown by the various fit indices in Table 4, indicate that the measurement model fits the data fairly well ($\chi^2/df = 1.60$, TLI = .92, CFI = .94, SRMR = .07, RMSEA = .06).

Table 5 reports the inter-construct correlations and the square root of the AVE. The results support the discriminant validity because, for each construct, the square root of the AVE is larger than inter-construct correlation (Schumacker and Lomax 2016).

6.2 Structural model and hypotheses testing

Before interpreting the paths of the structural model, we inspected the model fit. As recommended by Kline (2010), we used several indices to measure the model fit, including the TLI (.91), CFI (0.93), SRMR (.07) and RMSEA (.06); all of these satisfied the recommended level of acceptable fit. The results of the hypothesis testing shown in Table 6 found that 7 of the nine possible relationships were statistically significant ($p < .05$) and that all the statistically significant associations were positive in direction.

Table 4 Model fit of the measurement model, hypothesized model and final model

| | χ^2 | <i>df</i> | χ^2/df | TLI | CFI | SRMR | RMSEA |
|--------------------|----------|-----------|-------------|-------|-------|-------|-------|
| Measurement model | 232.05 | 145 | 1.60 | .92 | .94 | .07 | .06 |
| Hypothesized model | 199.89 | 116 | 1.72 | .91 | .93 | .07 | .06 |
| Final model | 165.63 | 116 | 1.43 | .95 | .96 | .07 | .05 |
| Criteria | | | < 3 | > .90 | > .90 | < .08 | < .80 |

We deleted the two non-significant paths (H6 and H8) from the prior hypothesised structural model and performed the path analysis again to test the modified model. The results of the final model reported in Table 4, also indicated a good fit ($= 1.43$, TLI = .95, CFI = .96, SRMR = .07, RMSEA = .05). Figure 2 shows the resulting path coefficients of the final structural model.

Behavioural intention to use, attitude towards use, perceived usefulness, and perceived ease of use were the four endogenous variables tested in the model.

6.2.1 Behavioural intention to use

Behavioural intention to use was found to be predicted by perceived usefulness and facilitating condition, resulting in an R^2 of .452. This result means that perceived usefulness and facilitating condition explained 45.2% of the variance in behavioural intention to use, implying that perceived usefulness ($\beta = .71$, $p < .01$) and facilitating condition ($\beta = .12$, $p < .01$) were both linked to trainee teachers' behavioural intention to use technology.

6.2.2 Perceived usefulness

The model explained 27.5% of the variance in perceived usefulness. Perceived ease of use ($\beta = .59$, $p < .001$) and subjective norm ($\beta = .21$, $p < .05$) were positively related to perceived usefulness.

Table 5 Discriminant validity for the measurement model

| Construct | PU | PEU | ATU | BIU | FC | SN |
|-----------|-------|-------|-------|-------|-------|-------|
| PU | (.74) | | | | | |
| PEU | .38** | (.71) | | | | |
| ATU | .34** | .40** | (.78) | | | |
| BIU | .50** | .38* | .36** | (.77) | | |
| FC | .30** | .15* | .15* | .30** | (.72) | |
| SN | .10* | .10* | .25** | .12* | .25** | (.81) |

* $p < .10$; ** $p < .05$

Table 6 Results of the hypothesis

| Hypothesis | Path | Unstandardized coefficient | Standardized coefficient | Standard error | t | Supported? |
|----------------|-----------|----------------------------|--------------------------|----------------|---------|------------|
| H ₁ | FC → PEU | .25 | .23 | .10 | 2.55* | Yes |
| H ₂ | PEU → PU | .47 | .48 | .09 | 5.09*** | Yes |
| H ₃ | SN → PU | .14 | .17 | .07 | 1.97* | Yes |
| H ₄ | PU → ATU | .23 | .25 | .09 | 2.68** | Yes |
| H ₅ | PEU → ATU | .42 | .47 | .10 | 4.05*** | Yes |
| H ₆ | SN → BIU | −.06 | −.08 | .06 | −1.01 | No |
| H ₇ | FC → BIU | .16 | .17 | .08 | 2.07* | Yes |
| H ₈ | ATU → BIU | .14 | .15 | .08 | 1.87 | No |
| H ₉ | PU → BIU | .50 | .56 | .10 | 4.98* | Yes |

* $p < .10$; ** $p < .05$; *** $p < .001$

6.2.3 Attitude towards use

Of the predictor variables, perceived usefulness ($\beta = .47, p < .001$) and perceived ease of use ($\beta = .13, p < .05$) were related to attitude to use. Specifically, the more trainee teachers believe that using technology would improve their job performance and their interaction with technology does not require much effort, their positive feelings about using technology increases. The model explained 39.7% of the variance in trainee teachers’ attitude towards use.

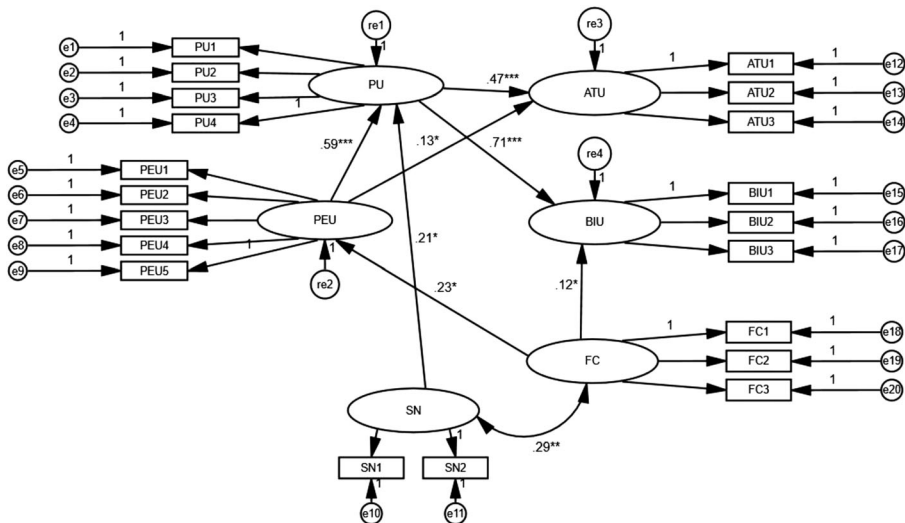


Fig. 2 Final structural model with standardized coefficients

6.2.4 Perceived ease of use

Facilitating condition ($\beta = .23, p < .05$) was associated with perceived ease of use. The model explained only 5.3% of the variance in perceived ease of use.

7 Discussion

We conducted this study to explore the factors that explain Bahrain trainee teachers' intention to use technology. Confirmatory factor analysis provided support for the reliability of the structural model. The overall model fit was acceptable. After the model fit was determined to be satisfactory, statistically significant relationships between the variables in the model were examined. Our results indicated that the research model explained acceptable proportions of the variance in the PU, ATU, PEU and BIU data. Also, of the nine possible relationships, seven were statistically significant ($p < .05$). These findings are discussed below concerning the four endogenous variables (PU, ATU, PEU, BIU).

7.1 Relationships among perceived ease of use, subjective norm and perceived usefulness

The findings of the study revealed that PEU and SN were strong predictors of PU. Our results are consistent with the investigations of Teo's (2011) and Li et al. (2019) that showed that subjective norms had a significant influence on perceived usefulness. This indicates that when trainee teachers have high subjective norms, they are more likely to use technology to enhance their effectiveness. These findings also support past research suggesting that PU and PEU are critical determinants of students' attitudes to technology use (Afari and Khine 2016; Teo 2010).

7.2 Relationships among perceived ease of use, perceived usefulness and attitude towards use

The relationships among perceived ease of use, perceived usefulness and attitude towards use support past research, which has indicated that perceived usefulness and perceived ease of use were robust predictors for teachers' attitude towards using technology (Li et al. 2019; Teo 2011). Our results suggest that when Bahrain trainee teachers acknowledge the usefulness of integrating technology into their teaching, and, the more comfortable they perceive the use of technology, they might likely have more positive attitudes towards technology use.

7.3 Relationships between facilitating conditions and perceived ease of use

The relationship between facilitating conditions and perceived ease of use support existing literature, which has indicated that when Bahrain trainee teachers see adequate technical support to be available, they might likely view the use of technology to be relatively free of effort, and this could enhance their intention to use technology (Li et al. 2019; Teo 2011).

7.4 Relationships among perceived usefulness, facilitating conditions and behavioural intention to use

Our findings indicate that behavioural intention to use was significantly related to perceived usefulness and facilitating conditions, supporting past research (Li et al. 2019; Teo 2011; Teo et al. 2008). Indicating that when Bahrain trainee teachers perceive technology to be useful and that using technology would increase their productivity, their intention to use technology will significantly increase. The study also suggests that Bahrain trainee teachers are more likely to use technology in their work if during their training as teachers they have been exposed to effective use of technology for instruction.

The relationship between subjective norm and trainee teachers' intention to use technology was not statistically significant. It is most likely that the trainee teachers in this study, are not going to rely on their future headmasters or head of departments to decide whether they should use technology or not (Robert and Henderson 2000; Teo 2011). Instead, they may rely on their interest to engage technology for teaching and learning.

There was no statistically significant relationship between attitude towards use and behavioural intention to use even though the latter was statistically related to perceived usefulness. This finding is contrary to a study of in-service teachers by Teo (2011) that found attitude towards use to have a direct influence on behavioural intention to use technology.

7.5 Conclusion and limitations

The present study has some limitations. First, one should proceed with caution with the generalisation of the results to other populations in Bahrain. Because this study involved a relatively small number of students from Bahrain Teachers College, and it is uncertain whether our findings would apply to other institutions in Bahrain. Secondly, because the study used self-report data, it raises the possibility of standard method variance. This variations among the scores are due to the method of data collection instead of the intended constructs (Teo, Luan & Sing, 2008), which may give inflated relationships between the variables (Kline et al. 2000).

Because the current study involved only year one trainee teachers in Bahrain Teachers College, we recommend that future research should extend to students in other year levels and also practising teachers in Bahrain schools. There is also a need to conduct longitudinal studies to gain a better understanding of trainee teachers' intention to use technology in the Kingdom of Bahrain.

Our results further suggest that trainee teachers in Bahrain are more likely to integrate technology in their teaching when their attitude towards technology use improves. The results also indicate that when Bahrain trainee teachers find technology easy to use and perceive usefulness in using computers for learning, their attitudes towards computer use may improve. The results also suggest that promoting students' intention to use technology could often be more successful with prior emphasis that using technology may enhance their learning. Teachers and educators could encourage the use of technology in teaching.

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