

## A PRELIMINARY EVALUATION OF SHORT BLENDED ONLINE TRAINING WORKSHOP FOR TPACK DEVELOPMENT USING TECHNOLOGY ACCEPTANCE MODEL

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### ABSTRACT

The use of Short Blended Online Training (SBOT) for the development of Technological Pedagogical and Content Knowledge (TPACK) is a promising approach to facilitate the use of e-learning by academics. Adult learners prefer the blend of pedagogies such as the presentation, demonstration, practice and feedback if they are structured and instructor-led with an efficient training length. In this paper, we suggest that SBOT has the potential to create a highly preferred environment for training if adult learning principles are considered. The study explores the evaluation of this mode of training by using Technology Acceptance Model (TAM). The results show a great acceptance for this mode of training. Moreover, in practice, dual training modes can be offered for TPACK development programs, which may consist of face-to-face training and SBOT.

**Keywords:** Short Blended Online Training, SBOT, TPACK development, Faculty development, Higher education

### 1. INTRODUCTION

The integration of online learning as an effective teaching method in Higher Education Institutions (HEIs) has been well received. HEIs have embraced this trend which allows them to provide a flexible environment for learning, to utilise different learning resources on the Internet, and to increase the interaction with learners (Ellis *et al.*, 2009).

Various domains of HEIs are inevitably influenced by the integration of instructional technology and must be redesigned and updated to take full advantage of the new digital tools in HEIs (Williams, 2002). One of these domains that should be updated in order to provide a successful implementation of instructional technology is the faculty knowledge. According to Bates (1997), one of the twelve organisational strategies for preparing HEIs for technology integration is training faculty members on how to use the technology and informing them of the need to integrate instructional technology into learning. Technological, Pedagogical and Content Knowledge (TPACK) constitutes the main required knowledge for faculty members to conduct online classes successfully (Mishra and Koehler, 2006). Faculty members may prefer this model of training because it includes elements of pedagogies (Friel *et al.*, 2009). In addition, the factors mentioned by Bates (1997) are covered by the TPACK model, as faculty members can identify easily the rationale of using e-learning tools according to the content they teach and the pedagogies they use. Thus, using the TPACK model is expected to facilitate faculty members' development and including the main related elements that are needed to conduct successful online instruction.

As the TPACK model was built on the Pedagogical Content Knowledge (PCK) model (Mishra and Koehler, 2006), similar issues are raised related to the theories that underpin these models and boundaries that govern the relationship between TPACK sub domains. According to E. Lee, Brown, Luft, & Roehrig (2007), identifying the theories that support PCK is a complex task. To address this issue, a learning theory must be selected according to the context in which the TPACK model is used. For example, because the context of the current study is HEIs, the principles of adult learning theories were used to design the SBOT training through the lens of the TPACK model (as will be further elaborated). Moreover, there are seven domains within the TPACK model namely Technological Knowledge (TK), Pedagogical Knowledge (PK), Content Knowledge (CK), Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), Pedagogical Content Knowledge

(PCK) and TPACK. The definitions of these elements and the boundaries between the sub-models were unclear. For example, Cox (2008) found 10 definitions for TPK, 13 definitions for TCK and 89 definitions for TPACK. Cox and Graham (2009) specified the boundaries that differentiated each sub-model and clarified their results with real case studies. Today, many instructional technologists utilise the TPACK model in faculty development programs (Chen *et al.*, 2009; Koehler *et al.*, 2004; Koehler *et al.*, 2007; Mishra and Koehler, 2006; Pryor and Bitter, 2008; Shin *et al.*, 2009; Voogt *et al.*, 2005; Yang and Liu, 2004).

The practicality of the TPACK development programs in HEIs should be considered since joining the development programs by faculties is challenging (Chick, 2002; Zelin and Baird, 2007). One of these challenges is the length of the training programs (B.Merriam *et al.*, 2001; Bingimlas, 2009; Chick, 2002; Owston *et al.*, 2008). In TPACK literature, using long-term training workshop is a dominant approach for TPACK development. Positive results have been reported in most of the studies (Chen *et al.*, 2009; Koehler *et al.*, 2004; Koehler *et al.*, 2007; Mishra and Koehler, 2006; Voogt *et al.*, 2005; Yang and Liu, 2004). These long-term training workshop continued mainly for one semester (Chen *et al.*, 2009; Koehler *et al.*, 2004; Koehler *et al.*, 2007; Mishra and Koehler, 2006; Pryor and Bitter, 2008; Shin *et al.*, 2009; Yang and Liu, 2004) or extended to nine months (Voogt *et al.*, 2005). The positive results of these studies are encouraging and can make TPACK development an actual reality. But unfortunately, the length for these studies is an obstacle from implementing long-term training in some of the HEIs contexts since faculties have a wide range of responsibilities. Therefore, providing instructor-led (Georgina and Hosford, 2009) and structured (Bailey and Card, 2009; Ke and Xie, 2009) training have the potential to create a sufficient training length. Also, addressing the social and job responsibilities is critical during the process of TPACK development. Therefore, using full online training as a training mode for TPACK development is promising because faculties are physically independent in this mode of training. Lastly, utilizing the Adult learning principles during the design of the TPACK development programs may contribute positively to the TPACK development programs. Addressing these elements can achieve a high acceptable environment for TPACK development. This in turn can facilitate process of TPACK development in HEIs.

Using full online training for faculty development is promising (Wolf, 2006). This type of training can improve faculty members' attitude towards utilising online learning in their classes (Carr, 2000). In addition, it can be a helpful mean for instructional technology training because faculty members who teach online should be trained using the LMS of their institutions to achieve a useful training (Wolf, 2006). Moreover, overcoming the constraints of time and place can provide a flexible form of online support, which is considered a critical element of resource support (Khan, 2001). Finally, online training can facilitate the recruitment of international experts for distance training. Using experts to conduct training programs can increase the quality of the training because instructional technology certified experts are conducting the training. All of these merits help to create a practical and quality training environment for TPACK development, especially in providing efficient training length in short online training forms (Team, 2004). For example, Marreo *et al.* (2010) explored the evaluation of a Short Blended Online Training workshop (SBOT) that was structured, limited the number of participants, and allowed participants to study on their own time. SBOT was used in the form of presentation sessions and online materials for in-service instructors' development. A positive acceptance of this mode of training was reported. Thus, SBOT is likely to be accepted by faculty, as it is aligned with the principles of adult learning theory and faculty members' preferences (as will be elaborated in the training design section).

In the current study, instructor-led (Georgina and Hosford, 2009) and structured (Bailey and Card, 2009; Ke and Xie, 2009) SBOT was used to explore its potential for creating a high accepted environment for TPACK development. The acceptance level of SBOT as a training mode for TPACK development was evaluated by using the Technology Acceptance Model (TAM). The focus was directed towards the field of social science because the analysis phase in the context of the study demonstrated the need to begin the TPACK training in this field. Although TPACK model comprises of seven elements, the core element is related to knowledge of the content's instruction using pedagogy that integrates technology effectively (Cox and Graham, 2009; Mishra and Koehler, 2006). The development of this element of the TPACK model is considered the main concern for faculty who wish to teach online (Lukaweski, 2006). Thus, the topic of this training covered blended online course design (BOCD) and blended online course development (BOCDE). The remainder of this paper is organised into the following six main sections: the training design, participants, data collection, findings, discussion and conclusion.

## **2. TRAINING DESIGN**

### **2.1 Adult learning theories and faculty preferences**

Understanding how adults learn in online professional development sessions is considered one of the best practice elements to design pedagogically sound training for faculty (Wolf, 2006). It is recommended by

McQuiggan (2007) to use adult learning theories when designing training programs for faculty. In the literature, various characteristics of adult learners have been reported (Bailey and Card, 2009; Knowles, 1973; Vanderbilt, 2008). Table 1 shows the Adult learning principles and how they were addressed during the design of the SBOT.

Table 1: Addressing adult learning principles during the design of SBOT

Online programs for adults should provide	How the training addressed the Adult learning principles
<b>An interactive process of extending adults' previous knowledge and transferring their new knowledge and skills to the workplace (Knowles, 1973; Vanderbilt, 2008);</b>	Previous experience of faculty in face-to-face classes was extended to cover blended classes
<b>Useful, relevant and practical training (Knowles, 1973; Vanderbilt, 2008);</b>	Selecting a training topic related to design and development of blended online course to create a useful training Using TPACK to design the training for social science faculty to create a relevant training Using short training to enhance the practicality
<b>Rich training experiences (Knowles, 1973; Vanderbilt, 2008);</b>	Using presentation-demonstration-practice and feedback to provide rich training experiences
<b>Safe environment to facilitate interaction and communication between learners and instructors as well as among learners (Bailey and Card, 2009; Vanderbilt, 2008);</b>	Using SBOT to create a safe environment
<b>Support, guidance (Bailey and Card, 2009) and encouragement (Knowles, 1973; Vanderbilt, 2008);</b>	Instructor-led training, presentation slides, demonstration, design-based template and WIM to provide support and guidance
<b>Feedback that confirms, corrects or informs participants (Bailey and Card, 2009; Knowles, 1973; Vanderbilt, 2008).</b>	Providing constructive feedback at the end of each training session to confirm, correct or inform participants

Faculty members have shown a preference for features such as instructor-led training (Georgina and Hosford, 2009), structured training materials and activities (Ke and Xie, 2009) and efficient training length (B. Merriam *et al.*, 2001; Bingimlas, 2009; Chick, 2002; Owston *et al.*, 2008). Instructor-led training and structured training materials can be considered as the support and guidance of the training in the fifth principle. Furthermore, providing efficient training length can be considered as the practicality of the training in the second principle. The successful implementation of the abovementioned principles can create an ideal environment for TPACK development.

## 2.2 Material design

Three types of training materials, presentation slides, the TPACK development template and the web-based interactive module (WIM), were designed and developed for the training. The presentation slides were used in the first session, the TPACK template was implemented in the second session and WIM was utilised in the third session.

The presentation slides included the theoretical and pedagogical foundation of e-learning, as this knowledge is considered crucial for faculty development (Bailey and Card, 2009). The presentation was divided into three parts and covered topics related to BOCD and BOCDE. In the first part of the presentation, an introduction to the training session was presented by describing the context of learning in HEIs today and how improving the quality of the graduates can help them to gain employment in the future. To capture the participants' attention (Morrison *et al.*, 2007), the trainer provided two real examples about how low-quality graduates could embarrass the department, the faculty, and the university. Furthermore, the training objectives were introduced to the participants (Ke and Xie, 2009; Morrison *et al.*, 2007). The second part of the presentation included an overview of some critical topics that should be considered when designing online courses such as principles of adult learning theory (Knowles, 1973), Bloom taxonomy (Moreno, 2010), TPACK concept (Mishra and Koehler, 2006) and online activities (Harris and Hofer, 2009). This knowledge was effective for creating a mutual understanding during the following training sessions about these concepts. The third part of the presentation

included an overview of BOCD using the TPACK template and the development of blended online courses in Jusur using WIM.

In order to reduce the time of blended online courses' design, providing faculties with a design template is expected to structure, facilitate and guide the design process. Also, producing a quality design by beginners can be achieved by using design templates (Boot, 2007). Thus, a design template that includes TPACK is designed for this training. It covers three forms of activities. They are pre-activities, main activities and post-activities. Pre-activities include three forms of activities. First form is gaining attention of learners (Bailey and Card, 2009; Chickering, 1987). This activity can be achieved online by using some forms of Multimedia such as video, pictures, or sounds (Moreno, 2010). Since it depends on the topic being taught and learners, no best practice technique for every faculty can be suggested. Thus, faculties are free to decide upon which type of gaining attention activity is suitable. Second form is communicating the objective of the topic with the learners (Bailey and Card, 2009; Chickering, 1987). This technique is effective to direct learners towards the most crucial elements of the topic and what they will be required to achieve as well. Last activity is the attempt to connect learners' previous knowledge with the new topic (Knowles, 1973). When succeeding to achieve that, acquiring the knowledge of the new topic is most likely to happened (Moreno, 2010).

The main activities are the activities by which a new topic will be presented to the learners. Harris et al.(2009) identified the social science activities that are used in the field of education and tried to suggest the compatible technology for them. For example, read text, view presentation and complete a review activity are some of the social science pedagogy that were identified. The authors recommended a compatible technology such as presentation software, note taking tools, audio/video recorders, whiteboards, and concept mapping software to apply view presentation activity online. More than one activity is recommended to be used to fulfil learners' diversity and provide informative feedback (Chickering, 1987). Therefore, the main activities can be used for content presentation and practice and feedback. A new column activity types were added to allow faculties to a blend of expository, active and interactive activities (Means *et al.*, 2009).

Lastly, post activities include some forms of activities such as summary and reviews (Morrison *et al.*, 2007). In summary activities, most critical points of the topics are highlighted while in the reviews activities we conduct a quick review for the whole topic. The template is attached in Appendix (1). The TPACK template includes the main elements of TPACK model as appeared in TPACK definitions (Cox and Graham, 2009; Mishra and Koehler, 2006) and the TPACK assessment instruments (Harris *et al.*, 2010; Schmidt *et al.*, 2009). These elements are:

- Selecting the suitable instructional methods or pedagogies according to the objectives of the topic being taught
- Selecting the suitable technology according to the selected pedagogies
- Having the ability to teach lessons that appropriately combine pedagogy and technology

The WIM was organised in a tree-structured representation, and it could be easily accessed through the instructional content icon in Jusur LMS. The trainer took screen shots from Jusur for every step of developing a new course, writing a description of the blended online course, and developing an online quiz. Every screen shot was marked with a red circle to show where to click. If there were multiple red circles in the screen shot, the circles were numbered.

### 2.3 Training description

The trainer led the presentation, demonstration and feedback sessions. On the first day of the training, the presentation covered the topics mentioned in Table 1. Illuminate software was used to share the Microsoft PowerPoint application with the participants. During the presentation session, participants were asked to freely use text to comment on the topics being presented or to use the "Raised hand" icon to obtain the microphone and provide spoken comments. Different topics were discussed related to the design and development of blended online course such as principles of adult learning theory, Bloom taxonomy and TPACK concept. These elements were highlighted during the presentation session although TPACK template was designed to provide the support to select the suitable instructional methods, the suitable technology according to the selected pedagogies and having the ability to teach when TPACK elements are implemented.

On the second day of the training, the trainer provided step-by-step instructions for the BOCD using the TPACK template. Since the learning topics are usually organized into modules and courses, the required task that should be completed by the participants was the design of one learning topic. Each faculty has the freedom to choose which topic is going to be designed by using the TPACK template. Copies of the template were emailed to the

participants and they were asked to begin the design process during the training session. If the participants faced any difficulties, they were able to contact the trainer directly. By the end of the training session, participants were required to return the TPACK templates. The trainer checked the returned templates and identified the most common mistakes. Through the desktop sharing service in the Illuminate software, the trainer presented several of the common mistakes that the participants committed during the design process and corrected them directly. This provision of informative feedback is critical for successful trainings.

On the third day of the training, the trainer demonstrated how to develop a blended online course using Jusur LMS, write a quality description for the blended online course, as described by Alamri (2010), and develop an online quiz. The trainer used WIM during the structured training and the demonstration session. Then, the participants utilised WIM for BOCDE. Participants were given a time to begin BOCDE. The participants were again able to contact the trainer directly if any difficulties arose. After completing the development process, three participants volunteered to present what they had developed to the group. During this time, the trainer provided feedback to the participants regarding BOCDE. The researcher conducted the training sessions and was supported by dedicated personnel from the technical support department at the National Centre of E-learning and Distance Learning (NCEL) in a Middle Eastern country. Participants were asked to direct their technical inquiries to the technical support personnel who joined the training sessions.

The presentation slides, TPACK template and WIM facilitated the presentation and demonstration of the training materials. To increase the practicality of the training, the TPACK template and WIM were used to provide structured training for faculty to apply the information from the presentation and demonstration portions of the training. Table 2 provides a comprehensive description of the training.

Table 2: Training outcome, pedagogies and technologies used

<p><b>Day 1</b> <b>First session</b> <b>(180 min)</b></p>	<p>Theoretical background</p>	<p><b>Pedagogy used</b> <b>Presentation</b></p> <p>Technology used <b>Microsoft PowerPoint</b> <b>LMS JUSUR</b> <b>Illuminate software</b></p>	<p><b>Main topics that were presented:</b></p> <p><b>Training outcomes</b> <b>Principles of adult learning theory</b> <b>Bloom taxonomy</b> <b>TPACK concept</b> <b>Principles of effective instruction (e.g., formative evaluation and group work)</b> <b>online activities (types and styles)</b></p>
<p><b>Day 2</b> <b>Second session</b> <b>(180 min)</b></p>	<p><b>Training outcomes (1/2): By the end of the training, the participants will be able to:</b></p> <p><b>Design blended online courses using the TPACK template.</b> Utilise at least one pre-activity. Utilise at least two activity types. Utilise one activity type for practice and feedback. Utilise at least two activity styles (expository, active or interactive). Utilise face-to-face instruction and online instruction. Utilise individual and group work. Utilise at least one post-activity.</p>	<p><b>Pedagogy used</b> Demonstration (30 min) Practice (100 min) Feedback (50 min)</p> <p><b>Technology used</b> Microsoft Word LMS JUSUR Illuminate software</p>	<p>Blended Online Course Design (BOCD)</p>
<p><b>Day 3</b> <b>Third session</b> <b>(180 min)</b></p>	<p><b>Training outcomes (2/2): By the end of the training, the participants will be able to:</b></p> <p><b>Develop blended online courses in LMS Jusur using WIM.</b> Develop a new course. Develop a description for the new course.</p>	<p><b>Pedagogy used</b> Demonstration (30 min) Practice (100 min)</p>	<p>Blended Online Course Development (BOCDE)</p>

	Develop a new quiz with a question and three distracters.	Feedback (50 min) <b>Technology used</b> LMS JUSUR Illuminate software	
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### 3. PARTICIPANTS

As the advertisement technique for informing faculty about the training was used, the sample was not randomly selected (Creswell, 2005) but a convenience sample (Johnson and Christensen, 2004). According to Johnson and Christensen (2004), if participants are chosen as a result of their ability to volunteer or for monetary goals, this sampling technique is called convenience sampling. Therefore, non-random sampling and convenience sampling were used for this research. The researcher promoted the training workshop on the NCEL website, and the online registration was open to faculty from different universities.

More than 100 participants were registered in the training workshop. The first 30 registered participants were selected to join the training, as this is the standard number of participants in NCEL training workshops. However, four faculty members did not join the training. No clear explanation for their drop out could be identified because inquiry emails received no response. Table 3 shows the participants' demographic data.

Table 3: Participants' demography data

Participants' Details		Number
Gender	Male	17 (62.9%)
	Female	9 (33.3%)
Age	22-26	1 (3.7%)
	27-33	8 (29.6%)
	34-39	13 (48.1%)
	+40	4 (14.8%)
	Unknown	0
Teaching experience	1-4	6 (22.2%)
	5-9	8 (29.6%)
	10-15	7 (25.9%)
	+16	4 (14.8%)
	Unknown	1 (3.7%)
Academic degree	BA	4 (14.8%)
	MSC	10 (37.0%)
	PhD	10 (37.0%)
	Unknown	2 (7.4%)
N		26

### 4. DATA COLLECTION AND ANALYSIS

According to Zawacki-Richter, Bäcker, & Vogt (2009), training programs effectiveness is primarily evaluated quantitatively in online learning research. Thus, the Technology Acceptance Model (TAM) questionnaire was used to evaluate the acceptance of the SBOT because TAM can be used to evaluate the participants' satisfaction with the online training as a medium of instruction (Arbaugh, 2000). There are three versions of TAM, as follows: TAM1 (Davis, 1989), TAM2 (Venkatesh and Davis, 2000) and TAM (or TAM3) (Lee *et al.*, 2011). In TAM1, two variables, perceived usefulness and perceived ease of use, are used to predict the acceptance of technology. Venkatesh & Davis (2000) updated TAM2 by adding the following seven variables: the intention to use, subjective norm, voluntariness, image, job relevance, output quality and result demonstrability. Lastly, Lee *et al.* (2011) included the following variables to use TAM for e-learning technology evaluation: task interdependence, computer self-efficacy, individuals' experience, task equivocality, management support and organisational support. The three versions of TAM build on each other and, therefore, there is no contradiction

between the variables. All of the variables were included in the current TAM questionnaire, except task equivocality and task interdependence because they do not contribute to SBOT evaluation.

The TAM instrument was translated into the Arabic language by the researcher and validated by five instructional technology experts. The pilot testing for the instrument was conducted during a pilot testing workshop and analysed using SPSS 19. Cronbach’s alpha reliability result for the TAM questionnaire was .853. Reliability scores ranging from .75 to .92 are considered satisfactory to outstanding (George and Mallery, 2001). At the end of the training workshop, the training was evaluated. Data analysis technique that used with TAM questionnaire is the report of frequencies and the average scores of the participants’ evaluation.

### 5. FINDINGS

The quantitative data that were collected using TAM questionnaire shows high acceptance of SBOT. Table 3 shows that SBOT was greatly accepted by faculty for TPACK development. The highest items in the SBOT evaluation were related to the training Usefulness (4.3), Ease of use (4.3) and the Behavioural Intention to join SBOT in the future (4.7). Additionally, an interesting result related to the need for Organisation Support to join SBOT was reported. Lastly, the technical knowledge of participants was high, as they evaluated the items of Computer Experience and Lacking Computer Self-efficacy as 4.0 and 1.1, respectively. Appendix (2) shows the detailed results for every item in the TAM.

Table 4: Acceptance of SBOT

Item	SD	%	D	%	N	%	A	%	SA	%	Mean
<b>Behavioural intention</b>	<b>0.0</b>	0.0	<b>0.0</b>	0.0	<b>0.5</b>	2.2	<b>5.5</b>	23.9	<b>17</b>	73.9	<b>4.7</b>
<b>Result demonstrability</b>	<b>0.0</b>	0.0	<b>0.0</b>	0.0	<b>0.7</b>	2.9	<b>9.3</b>	40.6	<b>13</b>	56.5	<b>4.5</b>
<b>Perceived usefulness</b>	<b>0.0</b>	0.0	<b>0.0</b>	0.0	<b>1.7</b>	7.2	<b>11.2</b>	48.6	<b>10</b>	43.5	<b>4.3</b>
<b>Perceived ease of use</b>	<b>0.0</b>	0.0	<b>0.1</b>	0.6	<b>1.7</b>	7.5	<b>10</b>	43.5	<b>10.9</b>	47.2	<b>4.3</b>
<b>Organizational support</b>	<b>0.0</b>	0.0	<b>1.3</b>	5.8	<b>0.0</b>	0.0	<b>4.3</b>	18.8	<b>16</b>	69.6	<b>4.3</b>
<b>Output quality</b>	<b>0.0</b>	0.0	<b>0.5</b>	2.2	<b>4.0</b>	17.4	<b>11</b>	47.8	<b>7.5</b>	32.6	<b>4.1</b>
<b>Individuals’ experience with computers</b>	<b>0.2</b>	0.9	<b>0.4</b>	1.7	<b>3.6</b>	15.7	<b>11.8</b>	51.3	<b>6.6</b>	28.7	<b>4.0</b>
<b>Voluntariness</b>	<b>2.0</b>	8.7	<b>1.5</b>	6.5	<b>2.5</b>	10.9	<b>7.0</b>	30.4	<b>9.0</b>	39.1	<b>3.7</b>
<b>Image</b>	<b>0.0</b>	0.0	<b>1.5</b>	6.5	<b>6.0</b>	26.1	<b>8.0</b>	34.8	<b>6.5</b>	28.3	<b>3.7</b>
<b>Subjective norm</b>	<b>1.0</b>	4.3	<b>0.0</b>	0.0	<b>12.5</b>	54.3	<b>6.0</b>	26.1	<b>2.0</b>	8.7	<b>3.1</b>
<b>Management support</b>	<b>4.7</b>	20.3	<b>2.0</b>	8.7	<b>7.7</b>	33.3	<b>6.7</b>	29	<b>1.0</b>	4.3	<b>2.7</b>
<b>Job relevance</b>	<b>5.5</b>	23.9	<b>5.5</b>	23.9	<b>4.5</b>	19.6	<b>4.5</b>	19.6	<b>2.0</b>	8.7	<b>2.5</b>
<b>Lacking computer self-efficacy</b>	<b>21</b>	91.3	<b>1.5</b>	6.5	<b>0.3</b>	1.1	<b>0.0</b>	0.0	<b>0.3</b>	1.1	<b>1.1</b>

### DISCUSSION

Using SBOT in HEIs can be considered an effective approach for TPACK development. The educational value of this training was high. Although it was not tested directly because this type of training is performed remotely, the reported acceptance can be used to predict the educational value (Joo *et al.*, 2012; Liao and Jen, 2011; Stephan *et al.*, 2009). The online training pedagogy that was used in the current study was useful and easy to use. As a result, participants intended to join future workshops that use this mode, as demonstrated by the behavioural intention item in the TAM. These results confirmed previous results that reported a positive effect of using online training for TPACK development (Marreo *et al.*, 2010; Pryor and Bitter, 2008; Schrum *et al.*, 2005). Faculty positively evaluated this mode of training, although encouragement and management support was low, as reported in the TAM. Thus, if universities encouraged faculty members to participate in online training workshops, it is expected that most faculty members in HEIs would prefer to use this mode of training for job-related development. The preference of online training, in turn, can accelerate and facilitate the implementation of development plans for technology integration in HEIs.

The positive impact of this study was a result of using adult learning principles and the TPACK model to guide the process of the SBOT workshop design. Faculty members' previous knowledge was extended (Knowles, 1973; Vanderbilt, 2008) by specifying why and how to incorporate instructional technology elements into their traditional methods of teaching. The training practicality, relevance and usefulness (Knowles, 1973; Vanderbilt, 2008) were appreciated. Using the TPACK model helped including practical training elements, BOCD and BOCDE. Furthermore, SBOT as a mode of training (Wolf, 2006) created a practical training environment. The practicality of the training was enhanced by the use of structured training (Ke and Xie, 2009). Structured training and the use of SBOT aided in creating a practical environment for TPACK development. In addition to using the TPACK to identify practical elements, it was used to include the pedagogy and technology elements that are relevant to the social science field. As a result of this process, the participants noted the usefulness of the training. Although it is reasonable for faculties to appreciate checklists and templates against which they can check their own pedagogical designs, the proposed training model is a complete package that includes presentation, demonstration, practice (blended online course design and development) and feedback. This blend of online pedagogies is the training style that was highly appreciated by the faculties. Considering only the use of checklists and templates does not grant the usefulness and the quality of the training.

Guidance and support (Vanderbilt, 2008) for training was accomplished through structured training materials, trainer support and technical support personnel. The trainer led (Georgina and Hosford, 2009) the presentation, demonstration and feedback sessions, and the faculty participated (Bailey and Card, 2009) through text or oral chats, which aided in creating a guided and supportive environment.

The rich training experiences (Knowles, 1973; Vanderbilt, 2008) through the presentation, demonstration, practice and feedback aided in the acceptance of SBOT. Furthermore, the SBOT provided a safe environment, which facilitated interaction and communication (Bailey and Card, 2009; Vanderbilt, 2008). The informative feedback (Bailey and Card, 2009; Knowles, 1973; Vanderbilt, 2008) also contributed to the acceptance of SBOT. The authentic comments that were provided at the end of the design and the development sessions corrected and informed participants about the quality of BOCD and BOCDE.

SBOT can produce quality training and sustain the time of faculty in HEIs. Considering adult learning theories and principles in the design of faculty training programs can create an ideal environment for TPACK development. Specifically, the use of presentations, demonstrations, practice and feedback (as described in this study) is a successful training strategy for TPACK development that can be added to other TPACK development techniques. These other techniques include design-based learning (Chen *et al.*, 2009; Koehler *et al.*, 2004; Koehler *et al.*, 2007; Mishra and Koehler, 2006), exemplary-curriculum materials (Voogt *et al.*, 2005), video modelling and reflections (Pryor and Bitter, 2008), and discussions (Shin *et al.*, 2009; Yang and Liu, 2004). The current study can be considered one of the first studies that utilize the principles of adult learning theories in the design of online training workshops for TPACK development and evaluating this design. The research area of faculties' development is one of the most neglected area of the research although it can be considered one of the most important research area in distance training as reported by 19 international experts in distance learning (Zawacki-Richter, 2009). Therefore, this study is considered a significant contribution to the literature of distance training in general and TPACK development in particular.

## CONCLUSION

Although the management support for faculty to join SBOT was limited, faculty highly evaluated their intention to join a future SBOT. The positive evaluation of SBOT for TPACK development is a remarkable expression for the effectiveness of the pedagogies and approaches that were applied in the training sessions. Moreover, communicating a clear expectation for the outcome of the course through the behavioural objectives of the training helped the participants focus on the requirements of the training. Furthermore, the instant technical support and the quality of the training led to the high acceptance of online training. This acceptance may, in turn, accelerate and facilitate the integration of instructional technology in HEIs. HEIs can offer dual modes of training (face-to-face and SBOT) for every training workshop. Providing SBOT is an attractive choice for HEIs because faculty with sufficient technological knowledge will prefer this mode of training, as found in the present study. In addition, this technique of training can increase the coverage of TPACK development programs to the entire faculty and can easily support faculty experience and exploration of online learning. The limited amount of time and effort required may increase participation in the training programs. Moreover, as recruiting professional instructional experts remotely is less expensive, the quality of the training programs can be increased significantly. The efficiency of this mode of training can provide a monetary resource to mix training with enjoyment activities on or off the university campus. Lastly, the large number of registered participants in the training and the reported positive experience with SBOT indicate that faculty accept this mode of training.

## REFERENCES

- Alamri, A. A. S. (2010). Criteria of e-learning Quality in higher education institutions. *Journal of Faculty of Education, Alexandria University*
- Arbaugh, J. B. (2000). Virtual classrooms versus physical classrooms: An exploratory study of class discussion patterns and student learning in an asynchronous Internet-based MBA course. *Journal of Management Education*. 24(213-233).
- B. Merriam, S., Caffarella, R. S., Wlodkowski, R. J., and P. Cranton. (2001). *Adult Learning Theories, Principles and Applications* John Wiley & Sons.
- Bailey, C. J., and Card, K. A. (2009). Effective pedagogical practices for online teaching: Perception of experienced instructors. *Internet and Higher Education*. 12, 152–155.
- Bates, A. W. (1997). Restructuring the university for Technology Change. Retrieved, from [http://cclep.mior.ca/Reference%20Shelf/PDF\\_OISE/Bates\\_Restructuring%20University.pdf](http://cclep.mior.ca/Reference%20Shelf/PDF_OISE/Bates_Restructuring%20University.pdf)
- Bingimlas, K. A. (2009). Barriers to the successful integration of ICT in Teaching and Learning Environments: A review of the Literature. *Barriers to The Successful Integration of ICT in Teaching and Learning Environments: A review of the Literature*. 5(3), 235-245.
- Boot, E. W. (2007). Novice and experienced instructional software developers: effects on materials created with instructional software templates. *Education Tech Research Dev*. 55, 647–666.
- Carr, S. (2000). Many professors are optimistic on distance learning, survey finds. *The Chronicle of Higher Education*, A35–A47.
- Chen, Y., Chen, N.-S., and Tsai, C.-C. (2009). The use of online synchronous discussion for web-based professional development for teachers. *Computers & Education*. 53, 1155–1166.
- Chick, S., Day, R., Hook, R., Owston, R., Warkentin, J., Cooper, P. M., Hahn, J., & Saunderson, J. (2002). *Technology and student success in higher education: A research study on faculty perceptions of technology and student success*. Toronto, Ontario: McGraw-Hill Ryerson.
- Chickering, A. W. G., Z. F. (1987). Seven Principles for Good Practice in Undergraduate Education. *The Wingspread Journal*. 9(2).
- Cox, S. (2008). *A Conceptual Analysis of Technological Pedagogical Content Knowledge*. Brigham Young University.
- Cox, S., and Graham, C. R. (2009). Diagramming TPACK in Practice: Using an Elaborated Model of the TPACK Framework to Analyze and Depict Teacher Knowledge. *TechTrends*. 53(5), 60-69.
- Creswell, J. (2005). *Educational Research : planning, conducting and evaluating qualitative and quantitative and quantitative research*. New Jersey: Person education.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly*. 13(3), 319–340.
- Ellis, R. A., Hughes, J., Weyers, M., and Riding, P. (2009). University teacher approaches to design and teaching and concepts of learning technologies. *Teaching and Teacher Education*. 25, 109–117.
- Friel, T., Britten, J., Compton, B., Peak, A., Schoch, K., and VanTyle, W. K. (2009). Using pedagogical dialogue as a vehicle to encourage faculty technology use. *Computers & Education*. 53, 300–307.
- George, D., and Mallery, P. (2001). *SPSS for Windows*. Needham Heights: MA: Allyn & Bacon.
- Georgina, D. A., and Hosford, C. C. (2009). Higher education faculty perceptions on technology integration and training. *Teaching and Teacher Education*. 25, 690–696.
- Harris, J., Grandgenett, N., and Hofer, M. (2010). *Testing a TPACK-Based Technology Integration Assessment Rubric*. Proceedings of the Proceedings of Society for Information Technology Teacher Education International Conference. 3833-3840.
- Harris, J., and Hofer, M. (2009). Instructional Planning Activity Types as Vehicles for Curriculum-Based TPACK Development. *Research highlights in technology and teacher education*, 99-108.
- Harris, J., Mishra, P., and Koehler, M. (2009). Teachers' Technological Pedagogical Content Knowledge and Learning Activity Types: Curriculum-based Technology Integration Reframed. *JRTE*. 41(4), 393–416.
- Johnson, B., and Christensen, L. (2004). *Educational research : Quantitative, Qualitative and Mixed-method Approach*: Pearson Education.
- Joo, Y. J., Lim, K. Y., and Kim, S. M. (2012). A Model for Predicting Learning Flow and Achievement in Corporate eLearning. *Educational Technology & Society*. 15(1), 313–325.
- Ke, F., and Xie, K. (2009). Toward deep learning for adult students in online courses. *Internet and Higher Education*. 12 136–145.
- Khan, B. H. (2001). A framework for web-based learning. *TechTrends*. 44(3), 51.
- Knowles, M. S. (1973). *The Adult Learner: A Neglected Species*. Houston: Gulf.
- Koehler, M. J., Mishra, P., Hershey, K., and Peruski, L. (2004). With a little help from your students: A new model for faculty development and online course design. *Jl. of Technology and Teacher Education*. 12(1), 25-55.

- Koehler, M. J., Mishra, P., and Yahya, K. (2007). Tracing the development of teacher knowledge in a design seminar: Integrating content, pedagogy and technology. *Computers & Education*. 49, 740–762.
- Lee, E., Brown, M. N., Luft, J. a., and Roehrig, G. H. (2007). Assessing Beginning Secondary Science Teachers PCK: Pilot Year Results. *School Science and Mathematics*. 107(2), 52-60.
- Lee, Y.-H., Hsie, Y.-C., and Ma, C.-Y. (2011). A model of organizational employees' e-learning systems acceptance. *Knowledge-Based Systems*. 24, 355–366.
- Liao, P. W., and Jen, T. H. (2011). Experimental teaching, Perceived usefulness, Ease of use, Learning Interest and Science Achievement of Taiwan 8th Graders in TIMSS 2007 Database *World Academy of Science, Engineering and Technology*(60).
- Lukawski, R. (2006). *A Research Study on Faculty Perceptions of Technology and Student Success*: McGraw-Hill Ryerson Limited o. Document Number)
- Marreo, M. E., Woodruff, K. A., and Schuster, G. S. (2010). Live, Online Short-Courses: A Case Study of Innovative Teacher Professional Development *International Review of Research in Open and Distance Learning*. 11(1), 81-95.
- McQuiggan, C. A. (2007). The Role of Faculty Development in Online Teaching's Potential to Question Teaching Beliefs and Assumptions. *Online Journal of Distance Learning Administration*. 10(3).
- Means, B., Toyama, Y., Murphy, R., Bakia, M., and Jones, K. (2009). *Evaluation of Evidence-Based Practices in Online Learning A Meta-Analysis and Review of Online Learning Studies*. Washington, D.C.: U.S. Department of Education Office of Planning, Evaluation, and Policy Development Policy and Program Studies Serviceo. Document Number)
- Mishra, P., and Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*. 108(6), 1017–1054.
- Moreno, R. (2010). *Educational Psychology*. Hoboken: John Wiley & Sons.
- Morrison, G. R., M.Ross, S., and Kemp, J. E. (2007). *Designing Effective Instruction* (5th ed.): John Wiley & Sons.
- Owston, R., Wideman, H., Murphy, J., and Lupshenyuk, D. (2008). Blended teacher professional development: A synthesis of three program evaluations. *Internet and Higher Education*. 11, 201–210.
- Pryor, C. R., and Bitter, G. G. (2008). Using multimedia to teach inservice teachers: Impacts on learning, application, and retention. *Computers in Human Behavior*. 24, 2668–2681.
- Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., and Shin, T. S. (2009). Technological Pedagogical Content Knowledge (TPACK): The Development and Validation of an Assessment Instrument for Preservice Teachers. *JRTE*. 42(2), 123–149.
- Schrum, L., Burbank, M. D., Engle, J., Chambers, J. A., and Glassett, K. F. (2005). Post-secondary educators' professional development: Investigation of an online approach to enhancing teaching and learning. *Internet and Higher Education*. 8, 279–289.
- Shin, T., Koehler, M. J., Mishra, P., Schmidt, D., Baran, E., and Thompson, A. (2009). *Changing Technological Pedagogical Content Knowledge (TPACK) through Course Experiences*. Paper presented at the the 2009 International Conference of the Society for the Information and Technology & Teacher Education.
- Stephan, P., Patrick, W., Koen, M., and Ed, v. S. (2009). *MODELING EDUCATIONAL TECHNOLOGY ACCEPTANCE AND SATISFACTION*. Proceedings of the EDULEARN09 Conference. Barcelona, Spain.
- Team, Q. (2004). *Cost Effectiveness and cost Efficiency in E-learning*. Trondheim: QUIS-Qulaity, Interoperability and Standards in e-learningo. Document Number)
- Vanderbilt, K. L. (2008). *Online Professional Development: An Analysis of Instructor Beliefs and Instructional Strategies for the Facilitation of Learning with Adult Educators*. Georgia State University, Atlanta.
- Venkatesh, V., and Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*. 46(2), 186-204.
- Voogt, J., Almekinders, M., Akker, J. v. d., and Moonen, B. (2005). A 'blended' in-service arrangement for classroom technology integration: impacts on teachers and students. *Computers in Human Behavior*. 21, 523–539.
- Williams, C. (2002). Learning on-line: A review of recent literature in a rapidly expanding field. *Journal of Further and Higher Education*. 26. 3, 263–272.
- Wolf, P. D. (2006). Best Practices in the Training of Faculty to Teach Online. *Journal of Computing in Higher Education*. 17(2), 47-78.
- Yang, S. C., and Liu, S. F. (2004). Case study of online workshop for the professional development of teachers. *Computers in Human Behavior*. 20, 733–761.
- Zawacki-Richter. (2009). Research Areas in Distance Education – A Delphi Study. *International Review of Research in Open and Distance Learning*. 10(3).
- Zawacki-Richter, O., Bäcker, E. M., and Vogt, S. (2009). Review of Distance Education Research (2000 to 2008): Analysis of Research Areas, Methods, and Authorship Patterns. *International Review of Research in Open and Distance Learning*. 10(6).

Zelin, R. C., and Baird, J. E. (2007). Training Faculty To Use Technology In The Classroom. *College Teaching Methods & Styles Journal*. 3(3), 41-48.

**Appendix (1): TPACK Template**

**Objectives of the Class:**

- (1).....
- (2).....
- (3).....
- (4).....

Pre: <input type="checkbox"/> <i>Gaining attention</i> <input type="checkbox"/> <i>Objectives of the topic</i> <input type="checkbox"/> <i>Eliciting previous knowledge</i>							
Activity name	Activity		Activity type			Mode	
	Activity 1 <i>Content presentation</i>	Activity 2 <i>Practice and feedback</i>	Expository	Active	Interactive	Face-to-Face	Online
Read Text							
View Presentation							
Listen to Audio							
Group Discussion							
Field Trip							
Simulation							
Debate							
Conduct an Interview							
Artefact-Based Inquiry							
Data-Based Inquiry							
Historical Chain							
Historical Weaving							
Historical Prism							
Answer Questions							
Create a Timeline							
Create a Map							
Complete Charts/Tables							
Complete a Review Activity							
Take a Test							
Written Knowledge Expression							
Visual Knowledge Expression							
Conceptual Knowledge Expression							
Product-Oriented Knowledge Expression							
Participatory Knowledge Expression							
Post: <input type="checkbox"/> <i>Summary</i> <input type="checkbox"/> <i>Review</i>							

**Appendix (2): TAM**

Perceived Usefulness	
Using online training in my job would enable me to accomplish tasks more quickly.	4.31
Using online training would improve my job performance.	4.43
Using online training in my job would increase my productivity.	4.17
Using online training would enhance my effectiveness on the job.	4.26
Using online training would make it easier to do my job.	4.26
I would find online training useful in my job.	4.57

Perceived Ease of Use	
Learning to use online training systems would be easy for me.	4.26
I would find it easy to join online training to learn what I want to learn.	4.26
My interaction with online training system would be clear and understandable.	4.48
My interaction with other trainees would be clear and understandable.	4.26
I would find online training system to be flexible to interact with.	4.39
It would be easy for me to become skilful at using online training system.	4.39
I would find online training system easy to use.	4.31

Output Quality	
The quality of the output I get from online training is high.	4.13
I have no problem with the quality of online training output.	4.09

Behavioural intention	
Given the opportunity, I would join online training.	4.74
I will strongly recommend others to use online training.	4.78
I intend to join online training in the future.	4.83
I intend to join online training as an autonomous learning tool.	4.52

Result Demonstrability	
I have no difficulty telling others about the results of joining online training.	4.57
I believe I could communicate to others the consequences of joining online training.	4.43
The results of joining online training are apparent to me.	4.61

Individuals' experience with computers	
I am confident of using online training even if I have only the system manuals for reference.	3.13
I am confident of using different online training systems to learn other subjects.	4.09
I am confident of using online training, even if I have never used such a system before.	4.26
I am confident of using online training system: As long as I have just observed someone using it before trying it myself.	3.83
I am confident of using online training system: As long as I have a lot of time to complete the job for which the training is provided.	4.7

Computer self-efficacy	
I dislike using computers.	1.30
Working with a computer would make me very nervous.	1.04
I get a sinking feeling when I think of trying to use a computer.	1.09
Computers make me feel uneasy and confused.	1.09

<b>Subjective norm</b>	
<b>My friends would think that I should join online training.</b>	3.17
<b>My colleagues would think that I should join online training.</b>	3.13

<b>Voluntariness</b>	
<b>Joining online training is voluntary.</b>	3.91
<b>My supervisor does not require me to join online training.</b>	3.52

<b>Image</b>	
<b>People in my organisation who join online training have more prestige than those who do not.</b>	3.83
<b>People in my organisation who use online training have a high profile.</b>	3.61

<b>Job Relevance</b>	
<b>In my job, joining online training is important.</b>	2.61
<b>In my job, joining online training is relevant.</b>	2.43

<b>Organisational support</b>	
<b>It is important for me to encourage joining online training within the organisation.</b>	4.22
<b>It is important for me to provide useful online training within the organisation.</b>	4.52
<b>When I am using online training, the provision of technical assistance from the organisation is very important.</b>	4.30

<b>Management support</b>	
<b>I am always supported and encouraged by my boss to join online training to perform my job.</b>	2.70
<b>My boss has a high interest in online training.</b>	2.83
<b>I am always supported and encouraged by my administrators to join online training to enhance the performance of my job.</b>	2.74

(1=strongly disagree, 5= strongly agree)