The Developmental Process of Managing Virtual Training for Teachers

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Abstract—This paper explores the developmental process of managing virtual training for 120 teachers from three different schools. Training sessions were administered in two phases: authentic environment and face-to-face virtual environment. Observation and content analysis were the two techniques employed in collecting the data. The outcome of the research was production of a system for managing virtual training for teachers.

Index Terms—Virtual training, technology training, instructional materials, ICT competencies.

I. INTRODUCTION

The British Educational Communications and Technology Agency [1] listed 7 barriers for teachers wishing to utilize and implement information and communication technologies (ICT). They are: 1) lack of teacher confidence and teachers’ computer anxiety; 2) lack of teacher competence in using technological tools and software; 3) lack of access to resources; 4) lack of time for receiving ICT training; 5) technical problems faced during technology implementation sessions; 6) teachers’ resistance to change and other negative attitudes; and 7) teachers’ lack of perception of the benefit of integrating technology into teaching and learning.

Similar research on barriers to ICT implementation in a Malaysian school context by [2] echoes [1]’s report and report additional barriers that includelarge class sizes, facility limitations, lack of real-life technological support for teachers, and heavy administrative loadsthat hinder teachers from focusing on improving their teaching practices.

From the perspective of teachers’ continued professional development (CPD), these barriers to technology integration can be further categorized into internal and external barriers. Internal barriers in this paper refer to intrinsic barriers related to the individual teacher, including perceptions and attitudes towards technology integration for teaching and learning such as lack of confidence in using technology, computer anxiety, lack of competence, resistance to change, negative attitudes towards technology, and perception of no technology benefits. These barriers could be reduced or overcome by changing each individual teacher’s perceptions and attitudes.

External barriers on the other hand refer to all extrinsic factors, both at the school and national level, hindering teachers from integrating technology into the classroom and over which teachers have no direct power and authority to control. Examples of school-level barriers are lack of access to resources, facility limitations, and lack of access to real-life technological support.

National-level barriers in this paper refer to characteristics of the overall design of the educational system itself. These barriers are especially evident in countries that implement centralized educational systems in which the federal government specifies a national curriculum, syllabus, and delivery system. Examples of such barriers include exam-oriented educational systems, large class size, and heavy administrative loads. Given these barriers, one question arises: how can these barriers be removed or at least minimized to assist in technology integration in curricula? Echoing other scholars’ arguments [3]-[6], we strongly believe that these barriers are inter-related in nature, i.e., one barrier could potentially lead to another. As [1] reported, lack of technological access potentially results in lack of teacher technology competence. Similarly, it can potentially contribute towards teachers’ lack of confidence in using technology for teaching and learning.

The complex inter-relationships between these barriers, however, do not imply that nothing can be done in terms of teachers’ continued professional development. We argue that teacher trainers should focus more on removing, or at least minimizing, the internal barriers to technology integration because they are much more manageable and controllable than the external barriers. Accordingly, what are the important elements a teacher trainer should consider when designing ICT training for teachers? The next section of this paper will review some aspects of effective training reported in scholarly literature.

II. REVIEW OF RELATED LITERATURE

A. Teachers and ICT Competencies

Ref. [7] highlights six important elements: policy and vision, curriculum and assessment, pedagogy, organization, teacher professional development, and ICT, as guidelines for enhancing professional development for teachers. Each element demands ICT skill if teachers are to further enhance their professional skills. Policy and vision focuses on technology literacy, knowledge deepening, and knowledge creation. Curriculum and assessment includes basic knowledge of technology, knowledge application, and 21st century skills. Pedagogy highlights technology integration, complex problem-solving, and self-management. ICT
includes basic, complex, and pervasive ICT tools. These elements further assist organizational efforts to improve on classroom standards and create collaborative groups and learning organizations. Digital literacy predominantly helps to manage and provide guidance for teachers’ professional development.

An approach has been designed to integrate ICT into professional development for teachers. It describes a new strategic approach in training for teachers ([8] and [9]) comprised of four different stages. The first stage is described as having traditional, emerging, and technology add-on elements, and technology is perceived in this stage as a component added to traditional curricula. The second stage involves transmission, application, and technology literacy. Teacher training in this stage focuses on the development of digital literacy and the use of ICT for professional development. The third stage highlights transition, infusion, and knowledge-deepening. In addition, teacher professional development in this stage should focus on ICT utilization in guiding students through complex problems and thereby manage a dynamic learning environment. The fourth stage focuses on transformation, and knowledge creation. Teachers in this stage are perceived as knowledge producers constantly engaged in producing new knowledge about teaching and learning [7].

Utilizing digital application for instruction enables teachers to practice higher-order thinking and decision-making skills. Digital application advocates instructional processes that produce effective learning in a contemporary society [10].

Ref. [11] explains that there is a positive relationship between teachers’ competency levels and their confidence in using ICT. Hence teachers with high confidence level in using ICT tend to believe that technology in ICT is useful in developing effective instruction if appropriately applied.

B. Effective Technology Training

A Professional Development Framework for E-learning aimed at developing the ability of staff to select and use appropriate e-tools and techniques to support and enhance delivery of the curriculum has been developed [12]. This framework includes:

- developing critical analyses of the potential applications of e-learning tools and techniques
- developing capability in introducing new teaching and learning techniques and tools, including selecting applications, designing blended learning programs, planning, and evaluation
- developing teaching, mentoring, and leadership skills to support an e-learning environment
- encouraging practitioners to reflect on their practice
- enabling career progression through acquisition of new skills and accreditation.

The topic of effective technology training has been discussed quite extensively in the literature. Some of its aspects that contribute toward its effectiveness are discussed below.

1) A mix of training providers

Each training provider approaches training differently. Some are very technically oriented while others are much more pedagogically oriented. Effective training should balance both approaches to provide maximum benefit. Additionally, each training provider will have his or her own preferred style and training format, leading to considerable variation in conforming to individual teachers’ preferences, styles, and needs [13].

2) Appropriate time for training.

Because teachers are occupied with various teaching and administrative duties, they may have very limited time to nourish their own personal development. Research on teachers’ ICT training in countries like the UK, Australia, and the USA suggests the importance of providing non-contact time for training during school hours [1]. This suggestion stems from the reported lack of personal time to learn technology because teachers spend much of their time teaching and attending parent and staff meetings.

Reflecting on the Malaysian context, [2] noted that Malaysian teachers are very much more occupied with administrative than with instructional tasks. They reported that Malaysian teachers are responsible for virtually every aspect of students’ lives in school, including collecting school-related fees, contacting parents in the event of students’ absences, various record-keeping tasks including monthly, mid, and final exam records, accompanying students’ to sports competitions and various social events like performances and meetings during special celebration days, and bringing students to clinics or hospitals in cases of unexpected illness, to mention just a few such tasks. Having a non-contact time for ICT training therefore may be seen as an added and unfair burden to teachers unless school administrators agree to free teachers from some of these duties and transfer such burdens to school administrative staff members.

3) Stages of training

Several scholars focusing on the field of instructional design have prescribed a variety of approaches and models for achieving effective training. The most recognized approach is [14] Gagne’s nine events of instruction. [14] proposes that teaching should be delivered in the following consecutive stages: gain attention, present objectives, stimulate recall of prior knowledge, present content, elicit performance practice, provide informative feedback, assess performance, and enhance retention and transfer.

With regard to technology training, [14]’s nine events of instruction maybe illustrated as follows: trainers should first gain participants’ attention before introducing the instructional objectives of the training. Instruction should begin by stimulating a recall of participants’ prior knowledge related to the training content they are about to learn. Next trainers should present content using a variety of appropriate instructional approaches supported with a variety of practices and informative feedback. Trainers should finally design a performance test for assessing participants’ understanding of the content presented earlier and proceed to enhance their information retention and knowledge transfer.

Content- and delivery-wise, scholars such as [15] suggest that training should first emphasize an understanding of the basic features and functions of the technology, then move forward to examples of its application in a teaching and...
learning environment. This is to ensure that teachers understand both the technological and the pedagogical components of technology integration. Similarly, [16] recommends that trainers should deliver training based on individual teachers’ experiences and skills with respect to the computers and particular technology to be introduced. Variation in levels of training is important to ensure that the training conforms to individual teachers’ needs.

Considering these important elements, the Me-CPD (Managing Electronic Continued Professional Development) model was designed to be a hybrid of managing face-to-face and virtual trainings. The next section of this paper describes design and implementation of this model.

III. METHODOLOGY

This research employed qualitative methodology in investigating the developmental process of managing virtual training for teachers. The research specifically utilized content analysis and observation techniques. The procedure of developing virtual training for teachers was examined step by step.

A. Observation

Step 1: Face-to-face training.

As a preliminary session prior to the virtual training, teachers went through a face-to-face training session. At this stage, teachers were exposed to e-CPD (electronic continued professional development) utilization and application in an authentic environment.

Step 2: Honorarium and certificates.

Trainers should encourage teachers to participate in the virtual training, and the school administration also played an important part in providing such encouragement. For motivational purposes, trainers provided certificates signifying participation in the entire program, and as further encouragement, an honorarium was also given to each participant.

Step 3: Guide.

Step-by-step guidance was requested by participants to help with some difficulty in accessing the virtual training platform. Assistance at the computer laboratory was also given to teachers having difficulty in logging in. This was the first stage of involvement in the virtual environment.

B. Content Analysis

Step 4: Participation.

Teachers began to participate in the virtual training environment as shown in Fig. 1.

Step 5: Feedback.

Teachers posted inquiries to trainers throughout the virtual training process. Interaction between trainer and teachers are illustrated in Fig. 2, Fig. 3 and Fig. 4.

Step 6: Production of instructional materials.

Some groups submitted the instructional materials in a video format online via YouTube. Fig. 5 is an example of online instructional materials in the form of video produced by a particular group of teachers.

IV. RESEARCH IMPLICATIONS

A system design based on the analyses described for management of virtual training for teachers was produced as illustrated in Fig. 6. The training environment was divided into two parts: authentic and virtual. The diagram of Fig. 6 is presented in the form of a pyramid to show the hierarchical relationships in the training process.

In an authentic training environment, the initial activity is a...
practical stage embodied by the face-to-face training session. Face-to-face training is a preparatory stage before experiencing virtual training [17], [18]. The next level, still within the authentic training environment, is labeled as the motivation stage. This provides essential strong encouragement for teachers to continue participation at the next level involving the virtual training environment [19].

The understanding stage is the first level of the virtual training environment. At this stage, the teachers were assisted and closely guided to ensure that they all signed on to the virtual training and were able to proceed onto the next level, the application stage. At this point, teachers explore and discover media of interaction and communication via e-collaboration [20]. They share their thoughts and opinions and thus reflect on their experience.

The final level is described as the synthesis stage. Eventually the teachers produce instructional materials via online video, thereby not only gaining pedagogical knowledge and practice but also experiencing virtual instruction [21].

V. CONCLUSION

Ref. [22] stated that educational institutions are increasingly challenged to develop more and more virtual instruction. Developing professional virtual training is cost-effective, fast, and efficient in delivering practical educational training. The designed management system is effective and useful and is recommended for future application in designing virtual training for teachers.

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