DESIGN AND DEVELOPMENT OF MULTIMEDIA LEARNING MATERIALS BY TEACHER EDUCATORS

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INTRODUCTION

Effective educators are life-long learners. As such, their professional development must be an on-going process of gaining new knowledge, refining skills and adopting new methods and technologies. Information and Communication Technologies (ICTs) are considered essential to replace the existing conventional approaches in professional development programmes for educators (Menon, 2004). ICT can be a powerful tool in professional development, as it allows individuals to become creative thinkers, problem-solvers and innovators. Thus, teacher professional development in the use of technology should be concentrating not only on training teachers on how to integrate technology into their teaching, but also on using technology as a means for offering their professional development (Carlson & Gadio, 2002).

"Teacher Educator as an Educational Technologist" is one of the courses in a practitioner-oriented professional development programme, the Master of Arts in Teacher Education-International (MATE-I) programme offered by the Department of Secondary and Tertiary Education at the Open University of Sri Lanka. The main objective of this course is to develop competencies among teacher educators to design, develop, implement and evaluate appropriate educational technologies. During the course of study of six months, the learners are required to develop a rationale for using educational technology, design learning experiences, select and use appropriate media to develop a technology-enhanced learning material, and evaluate its effectiveness with their students. They are supported to develop these competencies through the engagement in a series of inter-related learning and assessment tasks, including interactive multimedia learning material development, using the authoring tool Macromedia Director MX™.

The course learning and assessment tasks are designed based on the Instructional Systems Design (ISD) model, ADDIE model, which stands for Analysis, Design, Development, Implementation and Evaluation (NIIT, 2004). Initially, the teacher educators analyzed the need, target group, task and the context of their proposed activity. Next, they prepared a concept map indicating their design, specifying the instructional objectives, learning outcomes, subject matter content and its structure, learning experiences, evaluation strategies and instructional approach. They also selected media elements to be integrated, and a flow chart was prepared indicating the planned hierarchical and navigational structure of the learning material. Development of the material was done during a four-day workshop session, during which they prepared storyboards to visualize a detailed scene to scene breakdown of the material, created different learning objects with media elements to be incorporated and constructed the multimedia material using the authoring tool Later, they implemented the developed materials with their target groups and evaluated them.

This paper explores the process of design and development of multimedia learning materials by teacher educators. The objectives of the study are to:

- Find out perceptions of teacher educators on multimedia learning material development

- Find out the challenges faced by them during the process

- Analyze the multimedia materials developed by the teacher educators

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- Review the impact of multimedia development on the teacher educators
- Identify the strengths and weaknesses of the learning environment

METHODOLOGY

The research was designed as a case study, which explored various aspects of multimedia design and development process by a group of teacher educators. The sample consisted of 29 students in all three media, English, Sinhala and Tamil, who were registered in the course ESP2242, Teacher Educator as an Educational Technologist, in the academic year 2010/2011.Descriptive data were collected using multiple techniques such as administering a questionnaire, conducting individual and focus group interviews, reviewing student reflections and analysing the developed multimedia learning materials using a checklist. Data analysis was done mainly using qualitative methods, supplemented by quantitative methods.

RESULTS AND DISCUSSION

The participants were mature teacher educators, with a majority in the age range of 41-50 years and with over 10-20 years of professional experience. However, most had limited or no prior experience in computer-based material development, and use of a multimedia authoring tool was a novel experience for all.

Their perceptions revealed that development of multimedia material has been extremely useful or to a great extent, for a majority of participants (70%-90%) in increasing confidence and motivation in using computer technology, as well as enhancing skills on designing learning materials, selecting media and using software. Further, a majority (85%-96%) indicated that they were supported extremely or to a great extent by the guidelines and resources provided, day schools and workshops, and also interaction with instructors and peers. While 85% were satisfied extremely or to a great extent with the multimedia material developed by them and their personal development, 73% indicated satisfaction extremely or to a great extent, with the learning process.

It was interesting to note from their reflections, that despite the concerns and fears many had at the beginning ("I was really scared that I won't be able to do this"), there was also a motivation to face this new experience ("I felt this was a very difficult task, yet determined to try hard"). Moreover, their positive feelings at the end of the process were indicated by expressions such as "extremely happy", "great experience", very satisfied", "I am proud", "fully self-confident" and "I can't believe that I was able to do this!"

However, several challenges were faced by the participants, mainly, skill limitations in using computer technology and the multimedia authoring tool, and heavy time constraints. The most frustrating moments for many were claimed as dealing with various technical problems. For a majority, the most enjoyable moment was seeing the final output on screen after publishing the material.

Analysis of the developed multimedia materials revealed a variety of topics related to participants' specialized areas, ranging from English, Science, Mathematics, Buddhism to Psychology, Sports, Art and Drama. It was clearly observed that those who had prepared detailed storyboards were able to develop very organized and complete materials, with good navigation and interactivity, within the allocated time. Incorporation of multimedia was limited to text, still graphics and audio clips in most instances, whereas a few had creatively used animations and video clips, making their products more effective.

A majority of the participants claimed that the most important impact they had from this experience was "the ability to develop a multimedia learning material" which was considered as "a very valuable experience" and "A beginning to an essential educational opportunity". Further

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they expressed views such as, "The confidence I got and the ability to understand the potentials in me regarding handling technology", "I developed self-confidence and courage to work", "I understand the importance of moving forward with technology" and "I have already started developing more multimedia learning materials".

The strengths of the learning environment were identified as, sufficient instructions, good guidance and advise, use of computer technology and online method effectively, ability to cover a lot in a short time period, hands-on experience at workshop and introduction of a new software. Specific comments on the lecturers' contributions have been made by many, such as, "Patience and hard work of our lecturers- Without their helping hand I couldn't complete my CD", "The immense effort and commitment of lecturers to provide training on mm development" and "I felt very grateful to our lecturers for making this change in us".

However, insufficient time to complete the task was identified as the main limitation in the learning environment. Due to the lack of adequate computer skills and prior experiences in using multimedia authoring software, many participants were slow in learning and needed more developing time. Further, some had to use "trial and error methods" in certain instances. Many participants had suggested increasing the practical time allocation, more training on different software use, and providing training separately to different groups according to their skill levels.

It was evident that in the above process of design and development of multimedia learning materials, technology had been used to engage students in active, constructive, intentional, authentic and cooperative learning, which are attributes of meaningful learning (Jonassen, Peck & Wilson, 1999). While ICT has the potential to enhance student learning, it will be effective only if the learners are motivated to learn. The results revealed that the process has provided an opportunity to motivate the participants, who were mature teacher educators, to use learning technologies by making it relevant, appropriate, experiential, supportive, assessed, giving ownership, shared, integrated, interactive, understandable, enthusiastic, enjoyable and building self-confidence (Harvey & Mogey, 1999). Thus, the strength of carefully planned technology professional development programmes for educators, based on theories of learning, is emphasized.

CONCLUSIONS/RECOMMENDATIONS

The process of design and development of multimedia learning materials has been a novel, highly challenging, yet a very motivating and useful learning experience for the mature teacher educators. However, as adult learners, and novices to multimedia technology, they need adequate time, support and encouragement to become more comfortable with using the technologies. Gradual building upon their existing competencies and facilitating them to move from simple to complex processes will result in more productive outputs. Since this will be a very time-consuming task, encouraging collaborative efforts among teams of educators, rather than individualized efforts, would be more desirable. Further, recognition and appreciation of their efforts, identifying best practices and providing opportunities to make use of their developed competencies is also very important.

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