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Promises of the e-Lesson Creator: A Byproduct of Innovation in the Experimentation to Improve the Quality of Student-Teachers Experience in Teacher Education

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Abstract: Considering the important role of teachers in educating the nation's pupils, quality teacher education should be given priority. A benchmark of quality in teacher education is the ability to stay relevant with the rapid changes in our knowledge-based global society and at the same time is able to give equal relevance to local needs and aspirations of the nation. This requires a process which embraces change and adaptations. A pilot project was undertaken by the School of Educational Studies, USM which gave student-teachers the opportunity to experience authentic technology–supported constructivist learning environments in their teacher education programme. The aim of the project was to design a resource pool of reusable pedagogically sound multimedia learning objects based on the Malaysian Year 6 English Curriculum. This project was a collaborative effort between a multidisciplinary team consisting of teacher educators, web developers, in-service teachers and student-teachers. This effort culminated in an online multimedia repository, the 'e-Lesson Creator' which is described in this paper. With this project, ICT had provided a powerful tool to support the shift from teacher-centered to student-centered learning in teacher education, eliciting relevant changes to the traditional teacher educator- student teacher roles.

Keywords: teacher education, ICT in teacher education, technology and teacher education

Introduction

This paper describes an experimentation project conducted at the School of Educational Studies (SES), Universities Sains Malaysia, that led to the development of a multimedia learning objects repository, the e-Lesson Creator for English language teachers in Malaysia. The central issue in describing this project is to highlight the changes and adaptations made to the tools of teaching and assessment of student-teachers during the course of the project. There are several levels of student-teachers at the School of Educational Studies, namely at the diploma, undergraduate, and postgraduate levels.

Aspirations of Teacher Education in Malaysia

In Malaysia a teaching license may not be considered as crucial or essential as a medical doctor or lawyer's certification but teachers are entrusted with the future of the pupils. More often than not children see a doctor only when they are ill and many more never need to see a lawyer at all. On the other hand we hardly hear of children going through life without the guidance of a teacher. However, lately teachers have become popular punching begs for parents, ministry official and the public at large for the slightest of problems that crop up in schools. This is because everybody has an opinion on education and the teachers are not spared sharp and piercing criticism in the national newspapers. Teacher educators know that good teachers are seldom born but nurtured. So where is the nursery for the potential good teachers? Quality teachers often come from quality teacher education institutions. The manner they are equipped in these institutions to deal with the challenges in schools often results in quality teaching. Quality teacher education takes into considerations local needs, resources and milieu and global development molded with the aspiration of the nation. According to the American Federation of Teachers (http://www.aft.org/topics/teacher-quality/index.htm);

> *Research findings demonstrate that teacher quality is the single most important school variable affecting student achievement. Well-prepared, highly qualified teachers are essential if we are to ensure that all students achieve the high standards necessary for them to lead fulfilling lives and become productive students. The AFT believes it is the union's responsibility to work to improve teacher quality and enhance the teaching profession.*

However, in most developing countries funds are limited, classes are big, and teaching is still teacher centered. It has often been said that teachers are the world's best experts insofar as their pupils are concerned but at the same time many of these practicing teachers claimed that teacher education institutions are not preparing them for the classroom. Is our current teacher education system in danger of becoming a dinosaur and a relic? For the future of our children teacher education must be relevant to nurture good quality teachers. In order to stay relevant we need to change the manner we educate our teachers. We need to give our student-teachers the leeway to come up with innovative

ways of classroom instruction. With the rapid development of knowledge in our global society, teacher educators cannot consider themselves solely in the isolated role as an imparter of knowledge, nor should teacher education curriculum developers think that their curriculum can withstand the onslaught of time. We must remember the words of William Arthur Ward; *"The mediocre teacher tells. The good teacher explains. The superior teacher demonstrates. The great teacher inspires"*. We need great teachers and to produce them we need teacher-educators that are able to facilitate the construction of knowledge by student-teachers and are also able to work collaboratively with student-teachers in the dynamic process of reciprocal learning.

The trend in Malaysia is now towards student-centered learning and teachers now act as facilitators. However, formal education is still relevant and teacher classroom practices must be made relevant too. The Malaysian Ministry of Education is propagating and promoting several ideas of schooling such as Smart[1] (http://www.ppk.kpm.my/smartschool/concept.html) and Cluster[2] (http://ewrf.org.my/update/cluster_school_update.html) schools projects. These projects are doomed to fail if the teachers are not ready for it. Therefore, it is the responsibility of teacher educators and their institutions to make the necessary amendments and adjustment to the current teacher education programmes to stay relevant to both the needs and aspirations of the nation and to new knowledge on learning.

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[1]Apart form the role of education to fulfill national development goals and aspirations, the project also meant to address various educational needs as stated below:
·To prepare school leavers for the Information Age
·To bring about a systemic change in education, from an exam-dominated culture to a thinking and creative knowledge culture
·To re-emphasise science and technology education with a focus on creativity and innovation
·To equip students with IT competence
·To inculcate Malaysian values among the students and produce a generation of caring, peace-loving and environmentally concerned citizens.

[i2]The aim of creating cluster schools is that they will serve as models for seamless articulation between grades, best practices in curriculum, instruction and assessment. The selection of cluster schools is made based on curriculum criteria, student profile, management criteria and the physical set up of the school. The benefits for the cluster schools are, school heads given autonomy in five key areas namely human resources, school funds, student intake, teaching and learning, examinations and evaluation, school heads can choose some of their staff, for example, experts or coaches, funds will be channeled directly to schools, schools to be given the freedom to choose 10 per cent of their student intake and school can offer additional subjects not in the national curriculum.

New Knowledge on Learning

Based on research in the past few decades, new knowledge on how people learn is centered around the constructivist paradigm. Learners are now considered as active agents who engage in their own construction of knowledge through interactions with the environment. Learning activities in constructivist environment are characterized by active engagement, inquiry, problem solving and collaboration with others (Ismat Abdal-Haqq, 1998:1) A constructivist learning environment in teacher education should therefore involve collaboration between student-teachers and teacher educators in the process of problem-solving authentic tasks found in authentic settings which are closely related to work in the real world. Technology has been found to be one of the most promising tool to integrate constructivist principles in teacher education. Technology should be integrated into the student-teachers' coursework and fieldwork and student-teachers should be given the chance to explore creative uses of technology in their teaching. Teacher education institutions are faced with the challenge of preparing a new generation of teachers to effectively use these new learning tools in their teaching practices. (Resa, 2002 : 11). This means these institutions need to acquire new resources and expertise. As such teacher education should not involve outdated and outmoded modes if we were to stay relevant. Student-teachers must be given a chance to explore various possibilities based on their experience and the milieu they are in.

Authentic Tasks in Authentic Contexts

Schools in Malaysia are now equipped with infrastructure such as computer labs and hardware technology to support teachers in the learning process. However, the lack of multimedia resources, in part, has hindered the process of integrating technology into classroom teaching and learning. This is especially so in developing countries like Malaysia in which the main medium of instruction is not English. Apart from the lack of resources, most multimedia content available in the market are also not based upon the local context and thus might not be appropriate to promote the learning objectives of our country. In addition to that, some of the local multimedia resources available in the market are lacking in pedagogically sound principles. In order to find a solution to their problem, teachers are encouraged to develop multimedia resources for their own classroom teaching. However, with the amount of workload that they faced in schools

made it very difficult, if not impossible for them to find the time to develop their own multimedia resources.

The authors and their colleagues were earlier involved in the evaluation of a programme called "e-Learning for Life Project" sponsored by United Nation Development Programme and Coca-Cola Far East. Among the more important findings of the evaluation was that teachers were regularly posting their lessons plans to a website created through the project. However, upon checking with some of the teachers who regularly visited the website they expressed their unhappiness that the lesson plans were too rigid and modifying it to be used for their particular set of pupils was arduous. An authentic problem has now been identified from actual teaching situations in schools to give student-teachers the opportunity to solve problem within a technology–supported constructivist learning environments in their teacher education programme.

At the same time the authors and their colleagues were continuously thinking of ways to improve the education of their student-teachers. The curriculums of the undergraduate teacher education programmes at SES include the following components; subject content matter, pedagogy and practicum (teaching practice). As changing the whole curriculum is an arduous and laborious process at the university level, we decided to make adaptation around the curriculum instead. After some discussion we decided that the pedagogy component would be the best place to start. This component normally contain three parts; lectures, presentations and assessment. The evaluation of these students traditionally comes in the form of quizzes, tests, assignments and projects. We decided to use the assignments and projects as a way of learning rather than just an evaluation format. We have chosen to use Masters (2006:9) philosophy which states that;

> *"when learning is viewed as an on-going process that transcends particular teachers, classrooms and grades, the main purpose of assessment would be to establish where in their learning or development the individuals are at a particular time. What point have they reached? What might be done next to support their further learning and development?"*

In more ways than one this is an experiment to improve student-teachers

education by giving them the flexibility to determine their own learning. So we put the problem of the inflexibility of the lessons to the student-teachers as a problem based learning (PBL) process, which according to Duch et al. (2001); is a powerful learning process, which uses real problems to stimulate students to recognize and relate research concepts and information, work collaboratively and communicate effectively. PBL is an approach that encourages life-long habits of learning.

The PBL Task

A group of students from the undergraduate programme at the School of Educational Studies, Universiti Sains Malaysia were given an assignment to find innovative ideas for classroom instructions during their upcoming practicum. The condition of the task was that the lessons created must be reusable and flexible enough for their colleagues to use. They were told to use multimedia resources for this purpose. Many ideas were thrown in by these students in their assignments and these ideas were gathered and developed further by the teacher educators through discussions with their students. The teaching ideas these student-teachers started later led to the Reusable Multimedia Teaching Resources Project and finally taken a phase higher to the e-Lesson Creator Project. It must be mentioned that this prototype project was made possible by the grant awarded by United Nation Development Programme, and Coca-Cola Far East.

In the pedagogy component of the student-teachers' education programme, they were exposed to lesson planning of different types, however the different permutation covers the following stages of a lesson; a set induction stage, a presentation stage, a practice stage, a consolidation stage and an evaluation stage. Putting their ideas together we analogize the philosophy of their electronic lesson as that of a supermarket, where in-service teachers would be able to go 'shopping' for their students. First the in-service teachers have to decide what to buy and who to buy for (topic and student proficiency). Once the in-service teachers have decided on the topic and the student proficiency, the next step is to go to the 'supermarket' (multimedia library). In the 'supermarket', the in-service teachers will be provided with a 'trolley (an empty lesson template) and with this 'trolley', the in-service teachers can walk around the 'supermarket' (multimedia library) through the neat rows (different stages of a lesson) of shelves and collect 'materials' (resources) that they would need. Once their 'trolley' is full of multimedia learning

resources, the in-service teachers can leave the supermarket WITH the trolley (the completed lesson template). At 'home' (classroom) they can either 'serve' (teach) it straight from the 'can' (completed lesson template) or 'heat' (modify/adapt) it up a little to suite the 'taste' (needs) of the students. The student-teachers envisioned that the whole 'shopping spree' should not take more than 5 minutes for the in-service teachers to gather and download the multimedia resources in order to 'feed' and satisfy 40 of their 'hungry' students. Although the final product may not resemble their earlier initiative there is no question that it originated from the PBL task given to them.

Honing Students' Ideas into Sustainable Teaching Tools

This section reports on the design and the development of a prototype "e-Lesson Creator" which was designed as a resource pool of reusable pedagogically sound multimedia lesson objects for teachers to help them integrate technology into their daily lessons in schools without them having to spend too much of their time and effort in the development process. It must be reiterated that the original ideas came from the student-teachers themselves as part of their project work which was expanded and molded into workable solutions.

A multidisciplinary team consisting of postgraduate students, teacher educators and web developers worked collaboratively for the development of the e-Lesson Creator project. The main goal was defined, which was to develop pedagogically sound multimedia lessons objects for teaching English to be housed in an online repository for use by in-service teachers throughout Malaysia. A group of students from the graduate TESOL programme at the School of Educational Studies, University Sains Malaysia were given assignments to develop multimedia learning objects which are digital resources that can be reused for learning. Teacher educators in the field of TESOL were charged with supervising the development of these multimedia learning objects by the team of Masters and Doctoral level students.

The first step in the design process was to conduct a need analysis, which included problem identification, assessment of teachers' needs and specification of goals and objectives (Alessi & Trollip, 2001; Dick, Carey & Carey, 2001). Task analysis was

conducted on the primary six English language curriculum and content upon which to develop the learning objects were identified. Topics are categorized into three broad areas; World of Self, World of Stories and World of Knowledge. Based on the results of the needs analysis with a group of in-service teachers, one of the main requirements stated by the in-service teachers were that the lesson objects be customizable to suit the learning needs of learners with different levels of abilities. The in-service teachers also wanted the freedom to customize their contents so that it can be blended into their traditional classroom teaching. However, in addition to that, they do not want to spend too much time doing the customisation. The multimedia learning objects also had to be made readily available and easily accessible to in-service teachers at different geographical locations.

Instructional designers consisting of teacher educators in educational technology collaborated with the TESOL teacher educators and the postgraduate students in the TESOL program to organize and develop the multimedia learning resources. This team then worked in close collaboration with web developers to design and develop a multimedia learning objects repository to house the multimedia learning resources. Based on the teachers' requirement as obtained in the needs analysis, the multidisciplinary team decided on developing and refining the learning objects for three categories of children, namely the beginner, intermediate and advanced level students. This means that for each topic, three categories of learning objects were developed. In order to fulfill the requirement of customization, the team decided to break up each lesson into five events of instruction and for each event of instruction; the teachers' will be provided with different choices of multimedia learning objects. This design would allow the teachers to pick and choose the multimedia learning objects and customize them in order to create a complete lesson. In order to decrease the learning curve in customization, it was decided that the learning objects be based on a platform which was familiar to teachers and is readily available in schools. The use of Microsoft PowerPoint seemed to be the most popular choice. Apart from Microsoft PowerPoint presentations, other multimedia learning objects developed included Macromedia Flash objects, video clips, audio clips as well as graphics. Principles of good web page design such as clear and consistent page organization wise, use of space, clear and consistent navigations and hyperlinks were

adhered to during the web development process. The repository is developed based on an open-source content management system.

Formative evaluation was then conducted after the development process. The multimedia content developed by the multidisciplinary team was reviewed by a group of in-service teachers. The multimedia learning objects were then further revised and refined by the teacher educators themselves. An independent instructional designer experienced in website development was called to evaluate the website during formative evaluation and enhancements such as improvement to the navigation procedure and searching algorithm was suggested. These were duly implemented. The final product after formative evaluation is named the 'e-Lesson Creator', which is now hosted at http://www.lessoncreator.net. The main page of the e-Lesson Creator is shown in Figure 1.

Figure 1: Te e-Lesson Creator index page

Main Features of the e-Lesson Creator

The main features of the e-Lesson Creator website are described below.

Pedagogically sound reusable multimedia learning objects

A comprehensive set of teaching ideas are presently available online for teachers to browse, choose and download. These multimedia learning objects are in PowerPoint, Flash animation and video formats and are organized into three content areas based upon the National Curriculum; World of Knowledge, World of Self and World of Stories. In each of these content areas, the learning objects are organized into topics. Each of these topics are further structured into three levels of content based upon learners' ability;

beginners, intermediate and advanced. Figure 2 illustrates the organization of the learning objects in the e-Lesson Creator and the number of topics available under each content area.

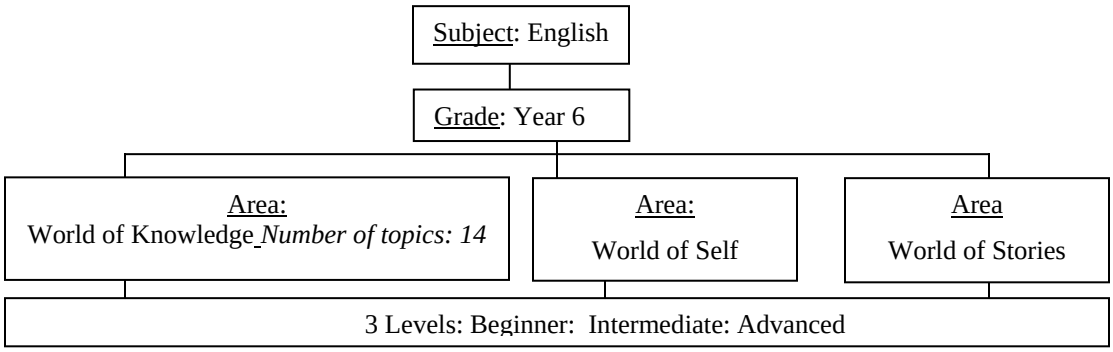

Figure 2: Organization of multimedia content in e-Lesson Creator

A typical instructional plan usually consists of five events of instruction, which are; set induction, delivery, practice, production and closure. The multimedia lesson objects of the e-Lesson Creator was developed based upon these five events of instruction. For each event of instruction, four learning objects were developed. This resulted in a matrix of 5 X 4 choices of learning objects for each topic at each sublevel of instruction. Table 1 illustrates the organization of multimedia learning objects for the Area: World of Knowledge, Topic: Local places > Towns and Cities, and Level: Beginner.

Table 1: A sample set of multimedia learning objects

Event	**Teaching ideas**			
Set induction	Stating landmarks	Matching places	Identify the name of cities	Stating the places
Delivery	Reading the text	Read and respond	Reading	Role play
Practice	Complete the partial answer	Label the names of cities	Matching sentences	Matching the questions
Production	Fill in the blanks	Write a letter	Note expansion	Write a short paragraph
Closure	Crossword puzzle	Word maze	State the locations	Drawings

A total of 3,241 teaching ideas were developed by the students. Details of the multimedia learning objects on the e-Lesson Creator can be obtained from the website's dynamic site map.

Dynamic Lesson Plan Template (Lesson Wizard)

The main innovative feature of this website is the Lesson Wizard, a dynamic lesson plan template that allow teachers to access the repository pool of multimedia objects as described in section above. The Lesson Wizard was specifically designed and created for facilitating teachers' creation of a multimedia lesson plan template. Teachers are guided to select the Area, Topic and Level of the lesson and then guided to select the multimedia learning objects for each event of instruction; Set Induction, Delivery, Practice, Production, Closure (see Figure 3). The resulting lesson will be generated by the dynamic lesson plan template system (see Figure 4). Upon generation of the lesson based upon the teachers' selection, teachers are given the option either to review their multimedia lesson or to download the lesson. If the multimedia learning objects that they have assembled with the help of the Lesson Wizard are not to their satisfaction, teachers can further revise upon the lesson (see Figure 5) and review it again. Once teachers are satisfied with the multimedia content assembled, they can then proceed to download the whole lesson. This flexibility of choice and generation of a complete lesson of multimedia learning objects is the main innovative feature of the website.

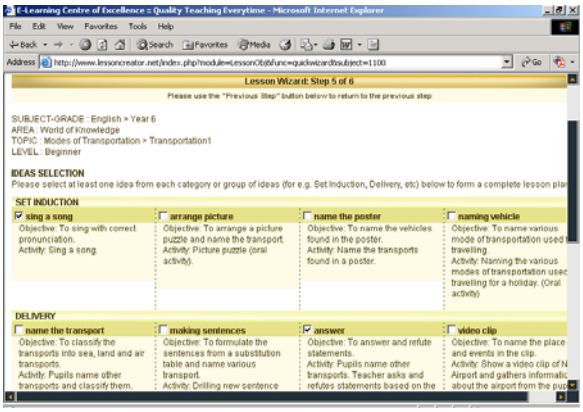

Figure 3: Customizing and assembling of learning objects

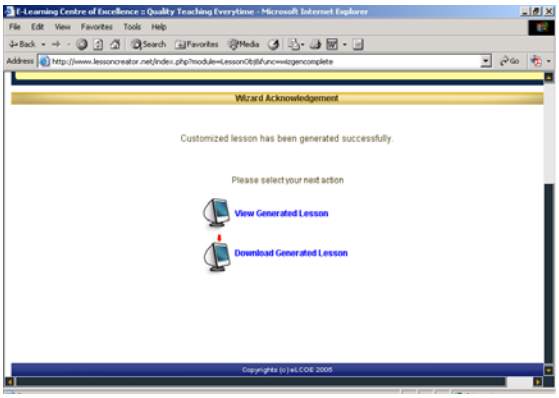

Figure 4: Generating the customized less

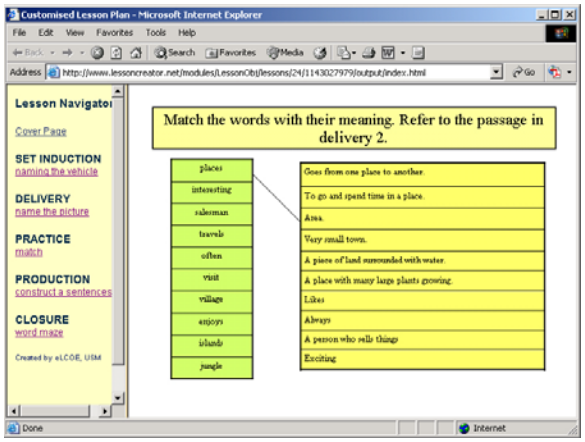

Figure 5: Reviewing the generated teaching ideas lesson

Downloading Engine

Once the teaching ideas lesson is generated, it can be downloaded. The downloading engine will automatically zip all PowerPoint, Flash and video objects and download it in mhtml format. Downloading is easy and efficient and can be completed with the click of a button. Once downloaded, the user needs to unzip the folder to obtain the individual teaching ideas.

Built-in Search Engine

Another useful feature of this website is the built-in search engine. Teachers can easily browse the repository of multimedia lesson objects from the built-in search engine available on the Teaching Ideas page. The search is conducted based upon keywords. The search results can then be previewed.

Registered Users Database System

A database system was developed to handle subscription and registration of users. When new users register on the website and an email acknowledgement will be generated automatically to the new users. The managing administrators of the website will decide whether to register the users into the system. When the users are registered into the system, a password will be automatically generated and this information will be emailed directly to the new users. The new users are then encouraged to login to the website and to change their password from the users' profile page.

Navigation system

Navigation on this website was developed based upon principles of good website design. Navigation is well constructed, easy to use and intuitive. New users are first encouraged to go through the lesson creation procedure systematically. This allowed them to browse and have an overview of the overall content of the website. Once they are familiar with the creation process, users are encouraged to use the express navigation panel which shortens the lesson creation procedure to a single panel. The express navigation bar can be accessed anywhere on the website.

Dynamic Tools of Teaching and Assessment

Curriculum is not just a fixed set of content in the form of knowledge and skill to be achieved. A teacher education curriculum needs to be dynamic enough to allow for changes to take place naturally without leading towards a drastic curriculum revolution. What we have discussed and shown here is just a small example of how dynamic teacher education can be. We have chosen not to make drastic curriculum changes but simply adapt new ideas to the current curriculum through the facilities already available in the

curriculum itself. Here we have chosen to use formative evaluation process as a learning process. According to Tuijnman & Postlethwaite (1994:3), evaluation is 'the making of a value judgment on the basis of evidence obtained through the measurement of attributes, characteristics and phenomena, whereby outcomes are related to certain goals and/or values set for the educational activities'.

Assessments are not just the assigning of grades. Black and William cited in Boston (2002) broadly define assessments to include all activities that teachers and students undertake to get information that can be used diagnostically to alter teaching and learning. Lambert & Lines (2000:4) too define assessment as "the process of gathering, interpreting, recording and using information about students' responses to educational tasks." Instead of textbook based assignments as is usually given in traditional teacher education programmes, in the example illustrated above, the student-teachers' assignments require them to problem solve an authentic problem with creative use of technology.

Conclusion

We would like to think that the experiment was a huge success as what started out as an experiment to improve instruction in teacher-education ended with a product – the 'e-Lesson Creator'. This is just a slash in the pen, a tip of the iceberg. There are so much more that could be done with the old vehicle (curriculum) to promote the gaining of new experiences for the student-teachers. We would love to make SES the nursery to develop good quality teachers through experiment and work such as this.

Presently, some postgraduate students are carrying out summative evaluation on the e-Lesson Creator. The usability of the e-Lesson Creator, the teachers' opinion on the multimedia learning objects is being sought. Preliminary results on the e-Lesson Creator indicated that the information was well-organized and was easily accessible. However, speed of retrieval and consistency of instructional language could be improved.

This project will be carried forward with the next set of student-teachers. The next problem based task could be to ask them to use the prototype e-Lesson Creator and provide feedback on its usability and suggest changes to improve and enhance the capability of the e-Lesson Creator. Perhaps in the next PBL project the students will be

asked to view this as a form of research. Feedback from these researches will help to improve the delivery of the e-Lesson Creator for the use of teachers. More future plans may include making student-teachers expand the website in terms of subject area and grade.

Another possibility that we are looking forward to is the Peer Coaching Programme, initiated by UNESCO and Microsoft under the Next Gen Teacher Project. This main aim of the Microsoft Peer Coaching Program is to enhance standards-based academic achievement through the integration of technology. The Peer Coaching Program is to help teachers successfully integrate technology into their classrooms. According to Microsoft Peer Coaching Program Facilitators Guide (2006); peer coaching is a process where teachers work together to supplement the curriculum and pedagogy within subjects such as approaching subjects from a multicultural perspective and to make connections between subjects (for example, by exploring the workplace applications of academic subjects). Peer coaches attend one another's classes, discuss what went on, and help one another solve problems. Unlike performance-review visits, which can be tense, visits from peer coaches are stress free and even enjoyable because the process is based on mutual support. Peer coaching provides an opportunity for teachers to help one another and to share the ups and downs of teaching. Peer coaching is not subject-specific, so it is adaptable to just about any discipline, including technology integration.

We would like to end this paper with a quotation from John Daniel, Assistant Director-General for Education, UNESCO (Resa, 2002:3);

> *"With the emerging new technologies, the teaching profession is evolving from an emphasis on teacher-centered, lecture-based instruction to student-centered, interactive learning environments. Designing and implementing successful ICT-enabled teacher education programmes is the key to fundamental, wide-ranging educational reforms."*

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