Schüssler Fiorenza, E. (1996). Breaking the silence – becoming visible. In E. Schüssler Fiorenza (Ed.), *The power of naming: A Concilium reader in feminist liberation theology* (pp. 161-174). Maryknoll: Orbis.

Schüssler Fiorenza, E. (1997). Struggle is a name for hope: A critical feminist interpretation for liberation. *Pacifica, 10*(2), 224-248.

Viviano, B. T. (1990). The Gospel according to Matthew. In R. E. Brown, & J. A. Fitzmyer, & R. E. Murphy (Eds.),

The new Jerome biblical commentary (pp. 630-674). London: Geoffrey Chapman.

Wainwright, E. M. (1994a, Spring). Review of 'But she said: Feminist practices of biblical interpretation' by Elisabeth Schüssler Fiorenza. *Women Church, 15*, 50-51.

Wainwright, E. M. (1994b). The Gospel of Matthew. In E. Schüssler Fiorenza (Ed.), *Searching the scriptures Vol 2: A feminist commentary* (pp. 635-677). New York: Crossroad.

TEACHING AND LEARNING:
A MULTIMEDIA-MEDIATED APPROACH TO PROBLEM-BASED LEARNING

Ken Neo Tse-Kian, Neo Mai, and Ahmad Rafi Mohamed Eshaq
Multimedia University
Malaysia

ABSTRACT

A multimedia-based project was used as an instructional tool to provide a problem-based learning (PBL) environment. Students worked in groups and used the multimedia development process (MDP) to solve problems. This paper focuses on the structuring of the learning process and the mapping of the MDP activities to the constructivist learning framework.

INTRODUCTION

The problem-based method in teaching and learning was developed in response to the weaknesses in the traditional directed instruction, which is generally teacher-centred. This teacher-centred mode does not encourage active engagement of students in their learning. It does not encourage students to become active, independent, and autonomous learners. The problem-based approach to teaching and learning, however, involves students actively in learning while solving a problem, focuses on the learners, and offers more flexibility for learners to enhance creative and critical thinking skills and problem-solving abilities. One of the problems facing many nations today is that graduates from many educational institutions do not have the appropriate skill-sets that are required by existing IT industries. Many of the current graduates are found to be lacking in creativity, communications skills, analytical and critical thinking, and problem-solving skills (Teo & Wong, 2000; Tan, 2000). This mismatch has created a need for educationists to seek new ways to transfer the appropriate skills and knowledge to the students in order to meet the rising expectations of the IT industry.

Currently, many institutions are moving towards problem-based learning (PBL) as a solution to this problem, and as a way of producing graduates who are creative and can think critically, analytically, and solve problems. Since acquiring knowledge is no longer an end in itself but a means of creating better problem solvers and, of encouraging lifelong learning, problem-based learning is becoming increasingly popular in educational institutions as a tool to address the inadequacies of traditional teaching. Traditional approaches such as face-to-face methods are teacher-directed instruction and therefore "do not encourage students to question what they have learnt or to associate with previously acquired knowledge" (Teo & Wong, 2000). The concept of problem-based learning, on the other hand, is seen as an innovative measure to encourage students to "learn how to learn" via "real-life" problems (Boud & Feletti, 1999). Since this learning mode is constructivist in approach, the students participate actively in their own learning and construct their own knowledge (Jonassen, Peck, & Wilson, 1999).

THE MULTIMEDIA-MEDIATED PBL MODEL

Multimedia is changing the way we communicate with each other. It has introduced important changes in our educational system and has impacted on the way we communicate information to learners (Neo & Neo, 2000). With multimedia, users have the flexibility to use this technology in numerous ways in the classroom. Because of its multi-sensory ability, multimedia can be used as an instructional tool to represent and present concepts and ideas using the various media types such as text, images, sound, animation, and video. Thus multimedia can be used to enhance the traditional "chalk-and-talk" method of teaching through multimedia-based instructional strategies.

The evolution of multimedia has provided new possibilities for learners to become involved in their work. With multimedia technologies, students can create multimedia applications to satisfy part of their project requirements. This can make the students active participants in their own learning processes, instead of just being passive learners of the educational content. Multimedia application design offers new insights into the learning process of the designer and forces him or her to represent information and knowledge in a new and innovative way (Agnew, Kellerman, & Meyer, 1996).

With the problem-based approach to learning, the focus moves away from the traditional learning of content towards problem solving, as this approach provides a more realistic and real-world environment for the learners. Figure 1 describes the traditional model of teaching, whereby the lecturer lectures the content to the students; and the conventional PBL model, which changes the role of the lecturer into a coach and of the students into problem-solvers while the environment's emphasis is on solving real-world problems (Tan, 2003). Tan (2000) postulates that the PBL environment "emphasises real world challenges, higher order thinking skills, multi-disciplinary learning, independent learning, teamwork and communication skills". However, this conventional PBL model can be further strengthened with the inclusion of multimedia technology into this problem-based learning environment to enhance the students' learning experience. The reinforced model or the multimedia-oriented, problem-based learning curriculum model incorporates the use of multimedia in the form of a multimedia project into the conventional PBL curriculum model, thus extending the conventional PBL model suggested by Tan (2000).

In this model, students are given a multimedia-based project to create that is based on a real-world problem described to them by their lecturer. In this manner, the students will have to develop the multimedia project through a process known as the multimedia development process, which is at the centre of this model as it provides the students with the means and steps by which they can create multimedia applications. Thus, by using the MDP to create a multimedia project to solve the problem at hand, the students essentially become problem-solvers, while the role of their teacher is transformed into that of a facilitator. Eventually, through the creation of a multimedia-based project, the students will enhance their critical thinking skills, their problem-solving skills, their communication skills and expose them to group or team work of a type which is now required in real-world situations. Multimedia has thus provided a new way for learners to become involved in their work.

With the use of multimedia projects, students are able to construct the knowledge that is presented to them by their teacher in a multi-sensory manner and make learning more meaningful to them. As stated by Agnew et al. (1996), "Student-created multimedia projects are beneficial, in addition, because they often involve substantial work, open-ended assignments, theme-based activities, and knowledge and experiences that the students draw from a wide variety of sources" (p. 9) Multimedia-oriented projects are "a way for students to achieve high self-esteem, to increase their ability to function as self-directed learners, to learn to think effectively, and to practice problem-solving and decision-making."
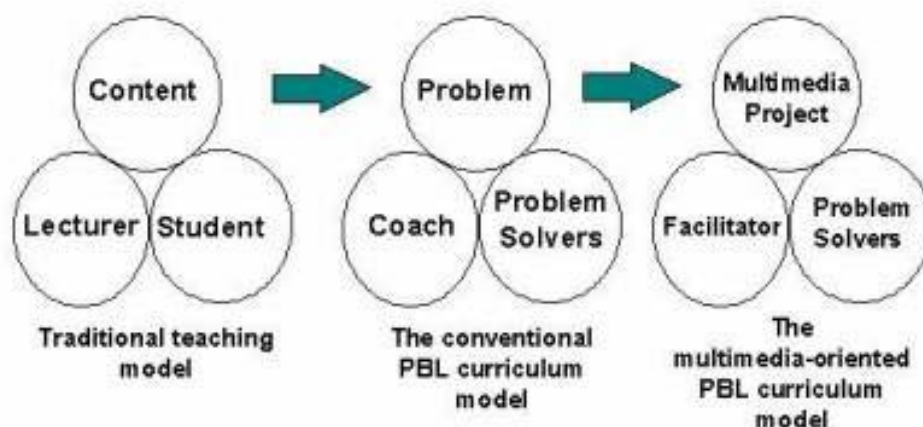
Figure 1. The traditional, conventional, PBL, and multimedia-mediated PBL models. Modified (with permission) from Tan (2003, p.44).

The multimedia-mediated PBL course

This study was based on observations made of the work of 46 students who were enrolled in a course that focused on multimedia concepts and multimedia project development. As such, students taking this course were placed in a constructivist problem-based learning environment. Since the class was structured to be a problem-based learning course, an ill-structured problem was posed early on. Students were told to form their own groups, with each group consisting of 4-6 people. The problem at hand was for them to create a multimedia application that was based on their knowledge, experiences, and research. The students in each group had to discuss and decide on the topic, which they wanted to explore. Once they had decided on the topic, each group had to develop a multimedia content application based on that topic. In order for the students to complete this project, they used the multimedia development process or MDP, which is a series of steps that enable the user to develop and create multimedia content.

THE MULTIMEDIA DEVELOPMENT PROCESS (MDP)

There are six levels to the MDP, which are as follows: (1) planning the project, (2) acquiring the resources, (3) converting the media elements to digital, (4) editing or creating media, (5) multimedia authoring, and (6) packaging for delivery. By using the MDP for creating the multimedia projects, students also take part in activities which are vital in a problem-based learning environment.

These activities are: (a) engaging in identifying problem and solution, (b) research, investigation, and media representation, (c) building a multimedia solution to the problem, and (d) consulting with the teacher. Figure 2 depicts the MDP model (Luther, 1994; Neo & Neo, 1998), which is mapped to the PBL activities.

Planning the project

In this phase, a project plan was made which defined the scope of the final multimedia project. The plan identified the aspect of the project that the students wanted to explore, the overall concept of their project or solution, and the target audience. The proposal included their group storyboard (which expressed the overall solution of their project), the specific interfaces of each screen, the media elements to be used, the information that is to accompany the screen design, and the navigational structure that they intended to use. Each screen of the application was sketched and the entire storyboard was submitted on paper.
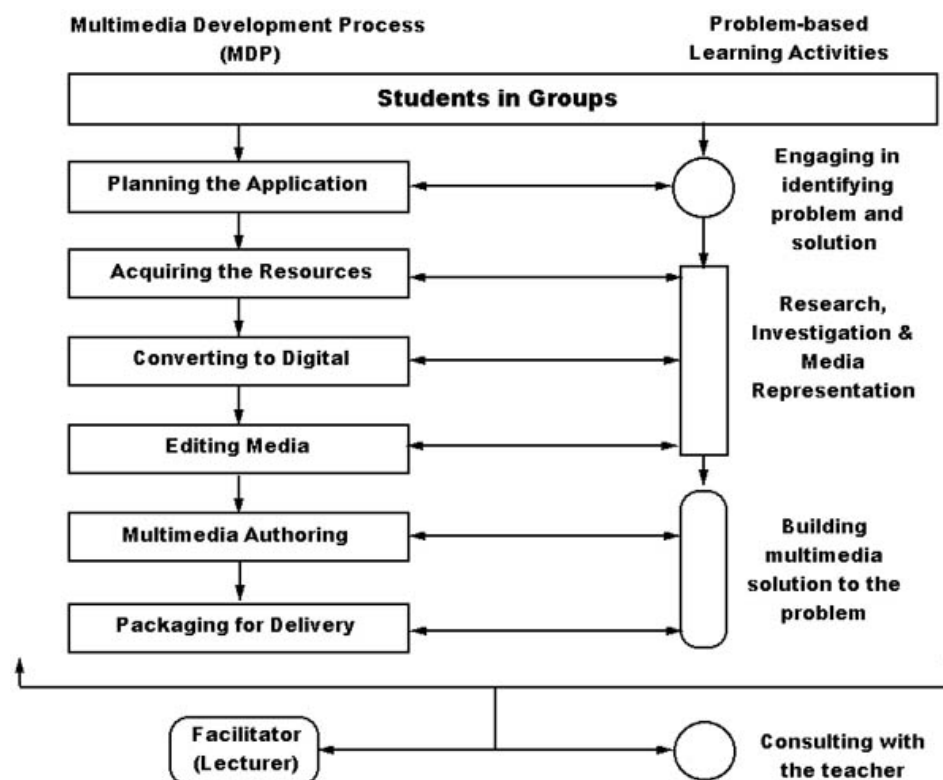
Figure 2. Mapping the MDP model to the PBL activities.

Acquiring the resources

When the topic of the project was agreed, students had to conduct their own investigation and inquiry through researching the topic of choice. They had to gather information on their interest through surfing the Internet or websites related to their topic of choice. Students also went out into the field to gather information through using technology and through interviews and meetings with third party sources who were in fields that related to their topic.

Converting the media elements to digital form

After all the materials had been collected and assembled, the students had to convert those materials that were in analogue form into a digital format. Examples were images in printed form which had to be scanned, or video clips which had to be digitised. These digital media were then saved in different computer files in a variety of file formats.

Editing or creating media

Once the media elements had been digitised and stored in the PC, they were then edited or modified by using software packages. Editing of various elements is an important step in MDP because the students have to use their creativity and skill, as they have to enhance, modify, and even remove elements that deviate from their focus. Since different images, colours, sounds, and video can effect how the user perceives the application, proper editing was conducted to ensure that the media was in line with the focus and direction of the students' multimedia process as they had discussed in the planning stage.

Multimedia authoring

At this stage, elements of interactivity and navigation were incorporated to involve the user in the application and to create a multi-sensory experience, as students continued their solution-building process. The primary authoring tool was Macromedia Director. The students were taught the basics of Director and were given tutorials in creating interactive applications almost every week during the 14-week course.

Once they had completed their applications, which included testing them according to their storyboard as the solution to the problem, they were ready to enter the final step of the MDP, which is packaging for delivery.

Packaging for delivery

At this stage of the process, the multimedia applications were completed. All the groups opted to deliver their applications via CD-ROMs as it was the cheapest and most viable solution. They also had to design a CD-ROM cover for their applications based on the conceptual representation of their final multimedia application. This was to give them authentic experiences in packaging applications for market distribution.

ROLE OF THE TEACHER

Throughout the course, students were encouraged to discuss the progress of their projects with their lecturer. The student groups would debrief the lecturer on their ideas and the direction of the project. The role of the teacher thus changed to that of a facilitator or project manager. The lecturer's task was to provide guidance and to set up some criteria that the students could use to help complete their projects. Students would also come to the lecturer for advice on technical as well as design problems. This provided the lecturer with the opportunity to monitor the students' progress and to make sure each group was not left behind. Certain problems that affected many of the groups such as technical issues, content, team management, and group conflict issues, were highlighted during lecture time. These problems were few and were solved amicably during the classes. However, the biggest problem encountered in the project was the scheduling of meetings between students but they overcame this by using emails and chatrooms to communicate with their peers as well as the teacher. Class lectures that were near the end of the semester were converted to consultation periods for both the students and the lecturer to gather feedback from one another. Once the project had been completed, each group had to give a final presentation in front of the class. This allowed other students to see what their course mates had done and to provide feedback to the presenting group where necessary. This also provided the lecturer with the opportunity to give some comments regarding each group's work. Once all the presentations were

completed, groups submitted their final applications on CD-ROMs to the lecturer.

THE CONSTRUCTIVIST LEARNING FRAMEWORK

The multimedia development process (MDP), used in designing this multimedia project, can be described basically as a constructivist learning environment which has embedded in it seven main characteristics (Cunningham, Duffy, & Knuth,1993). These are: (1) provide experience with the knowledge construction process, (2) provide experience in and appreciation of multiple perspectives, (3) embed learning in realistic and relevant contexts, (4) encourage ownership and voice in the learning process, (5) embed learning in social experience, (6) encourage the use of multiple modes of representation, and (7) encourage self-awareness of the knowledge construction process.

The activities involved in the design of this multimedia project, the MDP, reflect the various characteristics of the constructivist learning paradigm. Table 1 shows the characteristics of the constructivist learning and the matching activities in the MDP.

Thus, the activities involved in the MDP can be seen to embrace the important features of the constructivist learning mode. As illustrated in Table 1, the features of the constructivist learning are fulfilled by the activities of the MDP (Luther, 1994; Cunningham et al, 1993). Hence, a multimedia design project essentially can serve as a suitable tool to structure a constructivist learning environment and fulfill its basic requirements.

DISCUSSION

This approach to learning provides a sharp contrast to the traditional, directed-instruction learning mode, which is still used in many institutions of higher learning. In the traditional teacher-directed approach, students are passive learners, do not participate in their learning process, and have very little interaction with one another or with the teacher. In this problem-based learning project, however, students were active learners, participated actively in their learning process, and learned by interacting with their peers and their teacher. They collaborated and cooperated together to solve the targeted problem which was at the centre of their learning. They used the multimedia

development process (MDP) to build their project and multimedia elements to represent their concepts and ideas in constructing the solution to the problem.

In this process, students were engaged in constructing their own knowledge and determining their own learning path in order to reach their own learning goals. In this process, students learned content by a process of knowledge construction rather than knowledge absorption and reproduction as occurs in the traditional learning mode. Besides that, they were also engaged in their learning process, thus learning "how to learn" which will encourage them to be lifelong learners. In constructing this multimedia project, students also learned the essence of team spirit. They learned that in order to achieve success in their group project, they had to regard group interests above individual interests. They learned to cooperate and collaborate together rather than compete against each other for individual grades.

CONCLUSION

This project has clearly shown that the problem-based approach to student learning can be structured as a constructivist learning framework by incorporating a multimedia design project into the conventional PBL curriculum model of learning. The learning process is enhanced and provides student-centred learning activities whereby students enjoy a considerable amount of learning autonomy and control in their learning process. In this study, students learned by socially interacting with their peers and teacher, managed their own learning processes and learning goals, and thus became "owners" of their own learning outcomes.

Constructivist learning environment characteristics	Activities of the Multimedia Development Process
(1) Provide experience with the knowledge construction process	In using the MDP to design a multimedia project, students become active learners and participate in their own learning process instead of being the passive receivers of the educational content. It focuses on the process of knowledge construction rather than knowledge reproduction.
(2) Provide experience in and appreciation of multiple perspectives	This experience enables students to research, plan, and organize the content of the project and structure solutions to the problems. The design of the multimedia project by students can result in different solutions i.e., the problem has multiple perspectives.
(3) Embed learning in realistic and relevant contexts	The design project is anchored in the problem-solving contexts and the design problem is a realistic and authentic task, which is relevant to the students' learning, which they can understand and recognise and can solve by using their previous knowledge and experience.
(4) Encourage ownership and voice in the learning process	In the design project, students are engaged actively in seeking their own information and knowledge and finding their own solutions to the problem based on their previous experience and prior knowledge, thus giving the students ownership and voice in the learning process.
(5) Embed learning in social experience	By incorporating digital media elements into the projects, students are able to learn better since they use multiple sensory modalities, which would make them more motivated to pay more attention to the information presented and better retain the information. Students work in groups and learn from one another by interacting socially among the peers and the teacher, helping one another to achieve the overall group objectives.
(6) Encourage the use of multiple modes of representation	With multimedia projects, students can make use of the knowledge presented to them by the lecturer, and represent it in a more meaningful way, using different media elements such as graphics, audio or video to represent their information, thus the process encourages students to use multiple modes of representation.
(7) Encourage self-awareness of the knowledge construction process.	This process encourages and supports collaborative peer learning while the teacher acts as a facilitator and consultant, guiding students in solving their problems. After completing the projects, students make their presentations; thus having an opportunity to critique and reflect on their works. This process encourages a thoughtful reflection on their experiences, thereby making them aware of the knowledge construction process.

Table 1. Mapping the activities of the MDP to the constructivist learning paradigm (Luther, 1994; Cunningham et al., 1993).

The activities of the multimedia development process or MDP, which is the core of the multimedia design process, echo and reflect all the characteristics of a constructivist learning environment as stated by Cunningham et al., 1993). This constructivist learning is student-centred and provides a complex and media-rich learning environment which can provide optimal development for the students' intellectual and academic capacity. It is a viable and effective alternative to the traditional instructional method.

REFERENCES

Agnew, P. W., Kellerman, A. S., & Meyer, J. (1996). *Multimedia in the Classroom.* Boston: Allyn and Bacon.

Boud, D., & Feletti, G. (1999). *The Challenge of Problem-Based Learning* (2nd ed.). London: Kogan Page.

Cunningham, D. J., Duffy, T. M., & Knuth, R. (1993). The textbook of the future. In C. McKnight, A. Dillion, & J. Richardson (Eds.), *Hypertext: A Psychological Perspective*. Chichester, UK: Ellis Horwood, Ltd.

Jonassen, D. H., Peck, K. L., & Wilson, B. G. (1999). *Learning With Technology: A Constructivist Perspective*. New Jersey: Merrill/Prentice Hall.

Luther, A. C. (1994). *Authoring Interactive Multimedia*. Massachusetts: Academic Press, Inc.

Neo, M., & Neo, T. K. (1998). *The Multimedia Pavilion: Trends and Technologies*. Subang Jaya, Malaysia: Meway Computec Sdn. Bhd.

Neo, M., & Neo, T. K. (2000). Multimedia Learning: Using multimedia as a platform for instruction and learning in higher education. *Proceedings for the MMU International Symposium on Information and Communications Technologies (M2USIC'2000)* (pp. S3-1.1 -S3-1.4), Petaling Jaya, Malaysia, October 5-6. Cyberjaya, Malaysia: Multimedia University.

Teo, R., & Wong, A. (2000). Does Problem Based Learning Create A Better Student: A Reflection? *Proceedings at the 2nd Asia Pacific Conference on Problem-Based Learning: Education Across Disciplines*, Singapore, December 4-7. Singapore: Temasek Polytechnic, Temasek Centre for Problem-based Learning.

Tan, O. S. (2000, December 4-7). *Thinking Skills, Creativity and Problem-Based Learning*. Paper presented at the 2nd Asia Pacific Conference on Problem-Based Learning: Education Across Disciplines, Singapore.

Tan, O. S. (2003). *Problem-based learning innovation: Using problems to power learning in the 21st century*. Singapore: Thomson Learning (a division of Thomson Asia Pte. Ltd.)

THE 'POINT-AND-CLICK' GENERATION: Y NOT START HERE?

Lesley Ngatai and Sarah Towle
University of New South Wales

ABSTRACT

This paper is an open discussion about worlds within worlds. It will consider the "point-and-click" generation and what is meaningful to its members in relation to the practices and approaches in academic libraries. The paper will include some suggestions and examples drawn from the literature and from our own experience.

INTRODUCTION

Good practice in learning and teaching has become a core activity for academic libraries. Despite our concerted efforts and most compassionate approaches, many students still prefer to use the frameworks they bring with them. To facilitate the building of bridges, we can initiate dialogue by using the students' framework, of experiences and processes, as a starting point, and not as a model of deficiency.

This paper is not going to leave you gasping with disbelief, nor will it be espousing any groundbreaking theories. It might even be annoying to some because its message is so simple that it's like stating the obvious. But this message is capable of making such a profound difference that it cannot be overstated. At times we may seem a little over zealous, some might even say pedantic, but passion and exuberance lose their purpose when diluted with professional decorum.

Through professional observation and experience we have come to believe that,