

**PARTICIPATIVE LEARNING
WITH G-SCANNER AND iDE'LITE**

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ABSTRACT

Participative learning enables students to actively shape and share their learning experience, in achieving the goals of reflection and transformation. The learning process is accelerated through e-learning as students are able to learn better with audio and visual multimedia elements. Some problems do arise with e-learning that was not present in textbook learning though. They are: e-learning navigation are not intuitive; students are lost in the maze of information, students losing attentiveness and concentration after staring at the computer monitor too long, students are unable to link up the information properly with the topics and sub-topics. Most students prefer a handy hardcopy textbook for quick overview and reference. Staffs from the Info-Comm Technology Department of ITE College West have created a technology enabled "Interactive Book" concept to capitalize on the advantages and eliminate the problems. Students are able to draw out internet or movie from the text or picture prints in their textbooks by pointing it with an electronic device called a G-Scanner with software application which the dept has created to provide the interface on the computer. By pointing the G-Scanner on any text or diagram in the booklet and the computer will retrieve and display the multimedia explanation. For practical sessions, students are able to log into a web portal known as iDe'Lite. From there they view videos created for topics that were taught. They can also annotate in the videos and view their teacher's annotations. From the annotations, the teacher can provide comments or correct their mistakes. Students doing practical can also be video recorded and uploaded to iDe'Lite web portal for future references by students and teachers. With authentic activities, and social interaction and negotiations, comes more effective learning for students. This paper presents the participative learning framework enabled by technologies developed by ITE College West and discusses issues related to its implementation in teaching the core module in IT Essential & PC Support using G Scanner for the delivery of the theory portion and iDe'Lite for lab and demo sessions.

KEYWORDS

PARTICIPATIVE LEARNING , G-SCANNER , iDe'LITE , INTERACTIVE BOOK , EMERGING TECHNOLOGIES

CHAPTER 1 INTRODUCTION

Learning out of the classroom started way back in the 1953 with television learning by the University of Houston. Once the computer age came, learning progressed to the computers.

In 1960, PLATO (Programmed Logic for Automated Teaching Operations) system developed at the University of Illinois at Urbana-Champaign. The PLATO system featured multiple roles, including students who could study assigned lessons and communicate with teachers through on-line notes, instructors, who could examine student progress data, as well as communicate and take lessons themselves, and authors, who could do all of the above, plus create new lessons.

The E-learning revolution has arrived.

E-learning enable students to read the information on a topic, view instructional videos, listen to audio aids, and take quizzes and exercises related to the topic. Students are able to learn better with multimedia.

But E-learning didn't really catch on. There are many reasons some stated by Graham Attwell that many e-learning materials are unattractive and non-compelling and the next reason is the poverty of pedagogies for e-learning.

Other complaints are the E-learning navigation are not intuitive; students are lost in the maize of information, losing attentiveness and concentration after staring at the computer monitor too long, students are unable to link up the information properly with the topics and sub-topics.

CHAPTER 2 EMERGING TECHNOLOGY

People are starting to question although E-learning offers long distance learning and learning at each student's own pace, if it is more effective compared to classroom teaching.

Some people still prefer having textbooks or study materials to refer to and to jot down notes. Their argument is that having a hardcopy, would help them retain information better.

Is it possible to have the best of both worlds?

E-learning is able to captivate the students with multimedia elements and exercises and the students can learn at their own pace. Textbooks and study notes help the students retain information better and easier to browse from chapter to chapter. The potential of paper, such as random-access capability and intuitive search with view format is still an outstanding advantage.

In Info-Communications Technology Department, ITE College West, we have created a new, easy and convenient learning model for students by uniting E-learning with Textbook Learning to capitalize on the advantages and eliminate the problems. This is for the theory. For practical sessions, using the software portal named iDe'Lite, students are able to log in and view videos of their past works and step by step instructional video, along with comments tagging.

With the new learning model, students are able to draw out internet or movie from the text or picture prints in their textbooks by pointing it with an electronic device called a G-Scanner and software application which the dept has created to provide the interface on the computer or mobile handphone.

We have created handy Interactive books for some of our theory lessons which contain the core subject information while the detailed information was digitalized and easy to access through the new system. By pointing the G-Scanner on any text or diagram in the booklet and the computer will retrieve and display the multimedia explanation.

The new learning model with successful unity of E-learning and Textbook Learning has been proven effective and we received excellent feedbacks from students. We are able to have a captivating learning with e-learning elements and students can navigate and retain information better with the textbook provided.

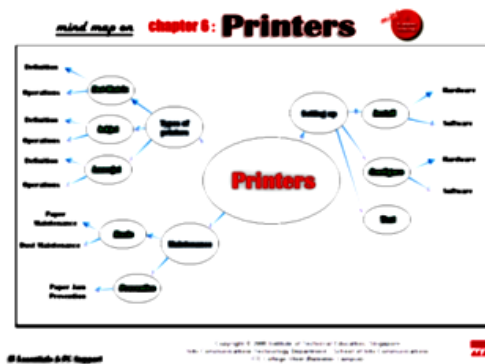
CHAPTER 3 EXAMPLES OF APPLICATIONS

There are many applications that can be developed using the G-Scanner with Interactive Book, together with iDe'Lite. We would just focus on the educational applications as follows:

1) E-Navigation Textbook System

The students use condensed textbooks, G-Scanners and multimedia CDs. The textbook are printed with mind maps for each chapter. A mind map is a diagram used to represent words, ideas, tasks or other items linked to and arranged radially around a central key word or idea. It is used to generate, visualize, structure and classify ideas, and as an aid in study, organization, problem solving, decision making, and writing. (an example shown below in Fig1.1)

Module : IT Essentials



Mind Map



Application

Figure 1-1 : Example of a Mind Map

The mind maps help the students to relate and link the information in the topic for better understanding and recapitulation.

The booklet also contains summaries of the topics taught, condensed information and pointers. This is to keep it handy for quick reference/ overview and not to overload the student with information.

Using the G-Scanner and a computer installed with the user interface application and digital medias, the student can point the G-Scanner on any part of the printed mind maps in the textbook to activate e learning on the PC with interactive video from the iDe'Lite portal, coupled with exercises. They can also view the multimedia presentation of the sub topics. The handy text booklet allows students to see the overview and key concept for the respective topics. Students have feedback that enabling e-navigation on textbook has made learning easier and allow quick reference and retrieval of information.

2) E-Navigation Prospectus

Each new student enrolling into the school is given a prospectus, together with a Cd-rom and a G-Scanner. The student can learn more about the course he or she enrolled for and more about the school. When the picture of particular course, facilities or event is pointed with "G-Scanner", the movies and data of the event are drawn out from attached CD. Student success stories can be incorporated into the CDs for motivation purpose.

This system is a revolution in content organization as it makes an enormous difference to students who would be able to access the data or information they are looking for.

3) E-Navigation Textbook Learning Package to help seniors, physically or mentally disabled students

The keyboard of PCs could be too complicated for seniors, physically or mentally disabled students who have problem keying input text into the computer. With the new learning interface, they can use can achieve what they want by simple and intuitive operation – just touching chosen picture with "G-Scanner". With a booklet on hand, it is easier for mentally disabled students to learn and still be able to navigate around the content of the CD.

4) iDe'Lite portal

ITE College West has created a website portal entitled iDe'Lite which allows students to log in and view past video content related to the modules they took. The videos are recorded and uploaded by lecturers teaching the module.

The iDe'Lite is quite similar to YouTube videos, except it has additional features that allow annotations to be typed by lecturers at specific moments of the video to aid the students to understand better the topic the video is showing. iDe'Lite also allows students upload their own video capture of themselves doing work. The teacher would look through their video and comment on their actions and mistakes. Students can then login and view the comments and understand the mistakes pointed out by the teacher.

Interaction through interviews and dialogue is also captured for students' reference. These videos can be shown over and over again to different classes and batches of students. The students can also view the videos at their own learning pace.

CHAPTER 4 THE TRIALS

We tested this project on a class of 26 students with a survey with a survey on why is the subject difficult for them to comprehend. Below are the results of the survey before and after implementation of the project. (Table shown in Fig1-2) The students understand and retain knowledge better after implementing the project.

S/N	Reasons	1 st survey responses (Students)	2 nd survey responses after implementation of solution (Students)
1	Did not pay attention due to boredom from text based	8	1

	teaching		
2	Notes are difficult to understand and visualize	10	2
3	Do not understand the teacher's description	3	3
4	No problem (NIL)	12	27
5	Duration of lesson too long	3	3

Figure 1-2 : Survey results

We then let the class do assignment 4 after implementing the project. Below is a chart (Figure 1-3) displaying the grades they have achieved. In Assignment 2 and 3, majority scored grades C and D. But after the project is implemented in Assignment 4, the grades for A and B increased. The level of difficulty for assignment 2, 3 and 4 are the same. Assignment 1 is not used in the chart because it is more difficult.

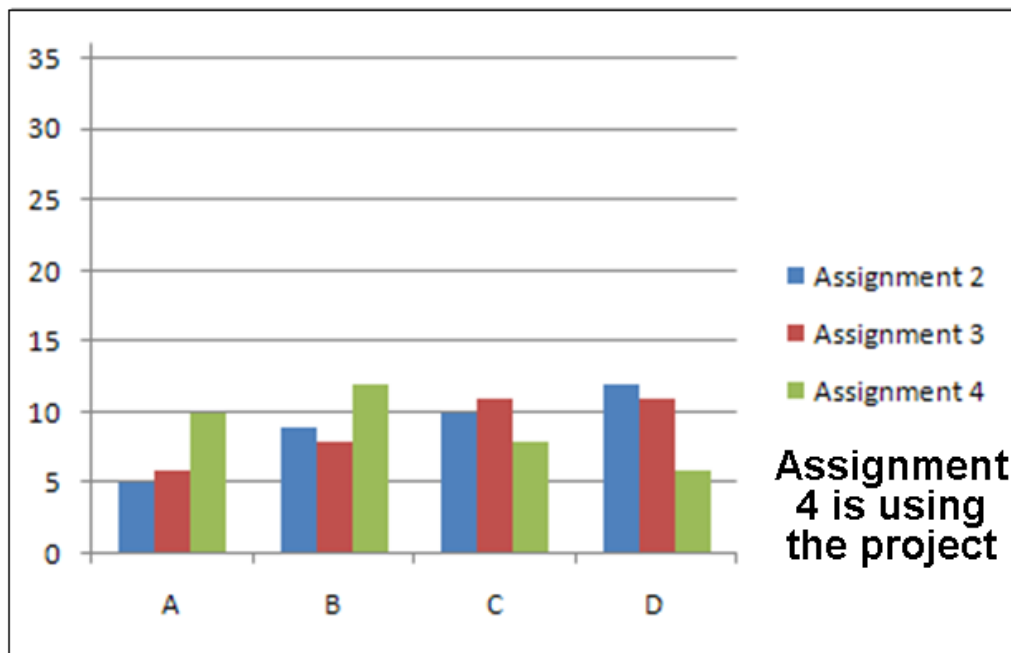


Figure 1-3 : Assignment results

CHAPTER 5 THE BENEFITS

The tangible benefits and intangible benefits are as listed from the implementation of the project.

Tangible Benefits

- Students spend lesser money buying textbooks. Cost savings of up to \$170 are saved from buying textbooks from the 2 years course.
- No cost incurred from development
- Better subject grades

Intangible Benefits

- Students are more compelled to learn with the new training materials and methods (Visual aids)
- Students learn faster and better as the new training materials are more visual and audio therefore appeal to their interests.
- Students will contribute to saving the earth by using less paper
- Students has higher retention rate.
- Students will not need to carry around heavy textbooks and lessen their load physically

- Students' morale are boosted
- The students learned better and score better hence strengthening ITE name and image.
- Developing the courseware by ourselves, the team members learnt HTML programming, a new skill for some.

CHAPTER 6 THE TECHNOLOGY

The G-Scanner is basically a small network camera with a dot code transmission device. It is able to read invisible dot codes on printed materials and call out the movies, music or Internet link to be displayed on PCs or handphones. The storages of the information could be CDs installed in the PCs, SD cards or direct downloads through wired/ wireless LAN from Internet servers, of which the codes and the information are tagged (Figure 3.1).

In developing our applications, we have created our teaching materials, printed with invisible dot codes that are tagged to the respective learning contents in digital media, which are stored in CD, SD cards (Figure 2.1) and in our internet server.



Figure 2-1 : User point the G-Scanner on any printed text or picture in the textbook to activate e learning on the Computer.

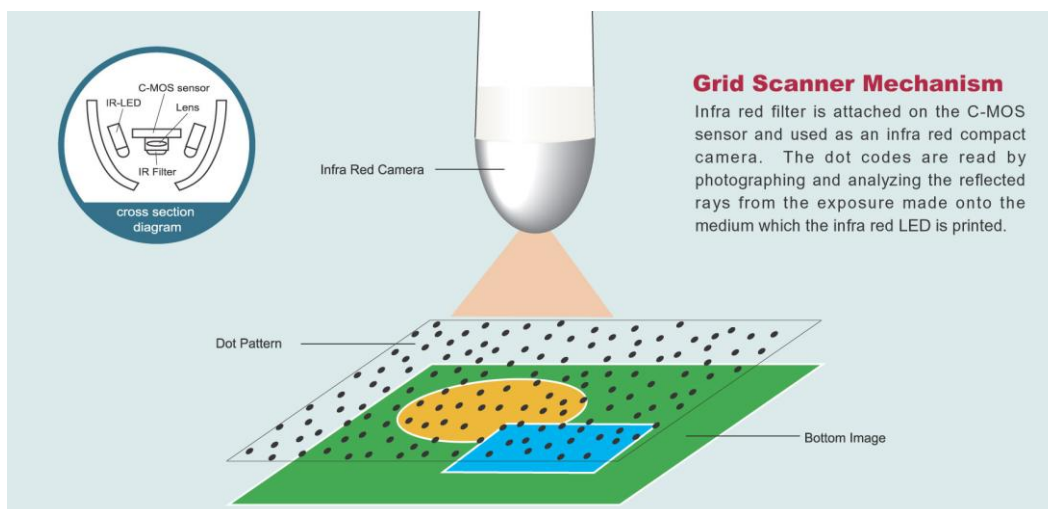


Figure 3-1 : How G-Scanner works

The iDe'Lite portal (Figure 4.1) features streaming videos in flash video (flv) format. They are able to display view cues/ captions along with the video. The cues/ captions can be commentary or instructions to facilitate learning, together with the video, in a practical session. The cues/ captions are inserted in the iDe'Lite software (Figure 4-1) before uploading to iDe'Lite portal.

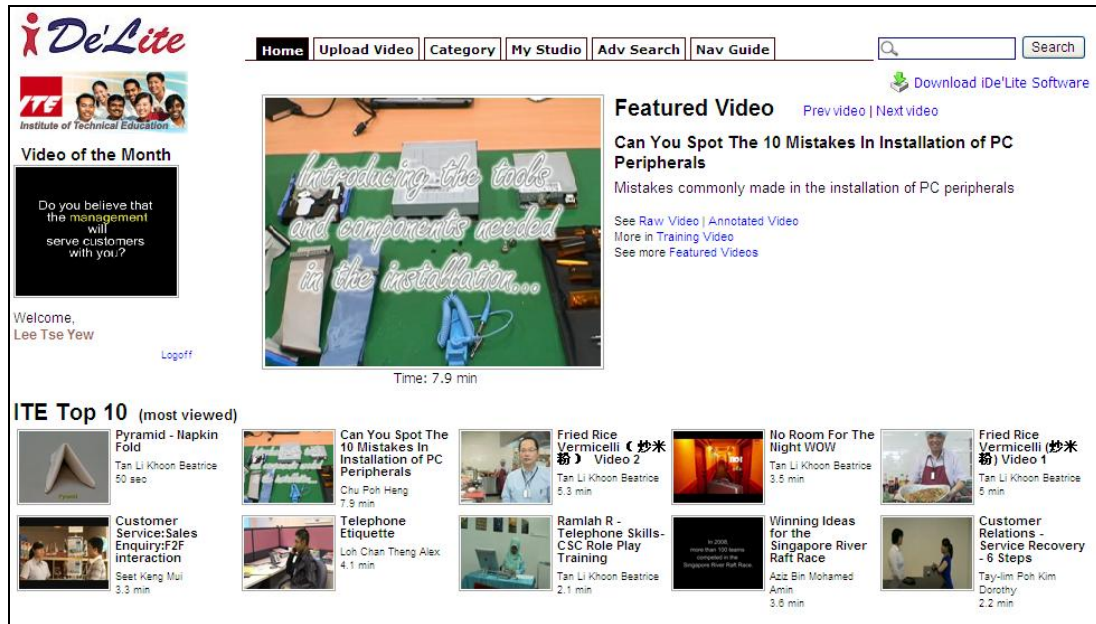


Figure 4-1 : iDe'Lite Homepage

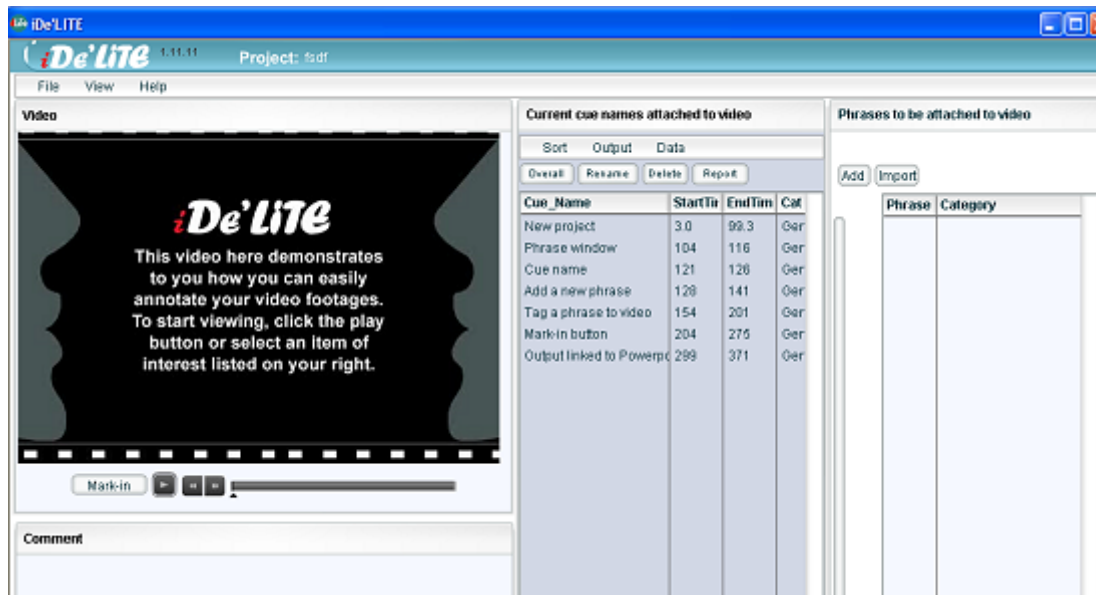


Figure 4-2 : iDe'Lite Software

CHAPTER 7 THE NEXT PHASE

Other ways of pushing the technology further is to put the multimedia content of the subjects on the internet server so that students will not always need to use the cd-rom. The G-Scanner is then able to point to the hyperlink in the web browser and the page containing information will be displayed. The iDe'Lite portal can be refined to include more videos with user feedback and better user management of the videos. The interface will be refined too to make it more intuitive.

There are many more applications that can be developed using this technology that would benefit the educational field.

The applications are only limited by the ideas. And human beings have no lack of ideas. That is what enables us to improve and develop more ground breaking educational technologies for the framework that would make teaching and learning more interesting and effective.

Technology is powered by humans. Humans are the source for technology to happen.

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Biographical Information

Tay Buay Kee is the Section Head of Info-Comm Technology Department in ITE College West. She was graduated from the National University of Singapore and has been with ITE for 29 years. She has been a Mentor-Lecturer before assuming the role of Section Head in 2004. She has presented several papers at local and overseas educational conferences over the years. Some of her achievements are leading her team of staff in several Innovation Panel projects, winning the Innova Award in 2007 and winning the Best Facilitator Award for Innovative Learning Circle in 2008.

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