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Integrating the Learning Management System with Mobile Technology

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Abstract

This article presents the common platform for both normal and disabled pupils' study in educational institutes so that the objective of "Education for All" can be achieved. The fled e-learning system here is designed to allow disabled pupils, both blind and deaf, to study together with normal pupils without any barrier. This multimedia web-based system consists of video conferencing and voice-to-text systems which will be distributed over the internet. First, a description of overall system designs is introduced. The algorithm of bidirectional communications between disabled and normal people is presented. The completed flexi e-learning system is then demonstrated. Some analysis results of the system performance are also presented here. Finally, this paper is ended with a brief conclusion.

Keywords – Integrating, Learning Management System, Mobile Technology

Introduction

Within most educational institutes there are a substantial number of students with varying disabilities. These might range from difficulty in reading to difficulty in attending the institute. Whatever their disability, it places a barrier between them and their education. According to the Malaysian Ministry of Education, students with special needs are those who are visually handicapped or partially or fully deaf or suffer from the disability to learn. These are the students that have been identified as suffering from physical-sensory deficiencies and learning disabilities. The Ministry of Education provides special education programs for the three types of disabilities, namely, hearing, visual and learning disabilities. The current technologically sophisticated educational system attempts to meet the needs of a school population that is more diverse, needy, and exceptional than at any other point in history. Educators quickly realize the special needs of students as children encounter difficulties academically and socially. The very nature of the term at risk is based on the perception that disabled students may dropout due to their living situation which affects their academic lives.

In the past few years there have been rapid and striking advances in commercial computer technology. But it seems that often, these advances are not applied within the assistive technology sector or only on a very limited basis. Part of the reason for this may be lack of awareness and knowledge of the technologies and lack of understanding as to how they may be employed to benefit students with disabilities. One principle of applied research is to design intervention programs targeted to teach useful skills to the disabled, while structuring the program to promote generalization of the skills to the natural environment. Proficiency in community skills (e.g. community navigation and shopping skills) allows a disabled person more opportunity to interact independently in their environment. Education to all is a concept of all students regardless theirs background and ability without any discrimination among them. This article presents on how the existing information communications technology (ICT) products can be combined in an assistive technology role. The system and applications discussed here do not require a high degree of technical skill to operate. Described here are the methods of deploying audio and video- streaming technologies that can be used as an integrated and fundamental tool to assist disabled students in their education life, from access to reading and listening material to video conferencing with lecturers for students who cannot attend the institute. In this fled e-learning system, the students, both normal and disabled will be listening to their instructor by either listening or

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visualizing or both. It can be real-time or on-demand. The teaching is delivered over the internet by capturing the video and voice of the instructor using video camera. These video and voice are then displayed and presented to pupils on the computers. The instructor's speeches will be converted into text format and then displayed on computer screen. All these multimedia contents can be saved for on-demand purpose. Therefore, the deaf pupils can be able to follow the lesson by form of visuals, by looking at the video and text on the computer screen. The blind pupils can listen to the instructor voice through computer headphone. Bidirectional communication is also possible where the deaf pupils can be able to communicate with instructor by messaging over the chat-room system, while the blind pupils can talk to instructor by using voice call system over net. Finally, it can be concluded that the objective of "Education for All" can be achieved for both normal and disable people by using this flexe learning system.

The system designs consist of two parts, hardware and software. The hardware part is made up from a server, a few client computers, and the internet utilities (wired or wireless). The client computers will consist of headphone with microphone and webcam. In the software part, there are many programs used to create a completed system. The server will be installed with web server operating system (OS) with database utilities, web editor, and video conferencing server. The client computers will be installed with windows XP web browser, and voice to text converter software.

A. Server Configuration

A server needs a high-end microprocessor and memory to keep the data processing continuous. It is leading to serve as many as client computers via networking utilities. To assure the server operate properly, a suitable OS must be installed. In our fled e-learning system, we use LINUX based server as its server. In this server, all client users are managed systematically by using internet protocol. The advantages of using IP as the interconnectivity . protocol is because IP can support client users in both local are network (LAN) and global internet network. The web server software is obtained from the third party and operated as a host to store all the flexd e-learning system files in hypertext mark-up language format. These system files will be called by all client users via internet connectivity and opened as web pages. The third party web server also provides the database capability in PHP system formats. This database system is used to control and manage the client users' access activity. It will provide information who are in the list of the system. The video conferencing server software is then installed in the server. This software will provide audio and video bi-directional communication interfaces to serve all dient users.

B. Client Configuration

There can be as many as client users in the flexi e-learning system depends on capability of its server. In order to access into this system, a client computer must be installed with some interface software. As usual the client computer must have being installed with dient OS regardless whether it is LINUX or WINDOWS based as long as it supports other interface software. In the fled e-learning system, the very important software in the client computer is voice to text converter. This software will convert the voice of a user to a text format. This converter software is provided by third party Dragon Naturally Speaking software. The other important software in the flex e-learning system is text to voice converter. This software will perform the information in audio format according to the provided texts. Each client computer is also installed with web browser interface so that the system application can be run as a web format. This web interface is used for the users to monitor all the activities in flexd e-learning system All the client computers are equipped with headphone, microphone and webcam. These basic accessories are used to convey all the information in audio and video format from one user to other remote users via web server. On the other hand, the user can also convey information in text format to other remote users by using the popular web chatting system. Therefore, there are three type of information; text, audio and video can be conveyed between

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each other in the flexd e-learning system via IP beaed Internet connectivity. Here, the user does not need to know how the system be operated in the client computer, but only monitor the sym activities in the application interfaces.

Red E-Learning System

In the disabled friendly fled e-learning environment, there is a lecturer and a class of students which consists of both normal and disabled to form a class community. The disabled students can be in form of blind, deaf, dumb or and spastic. This e-learning system is conducted in an environment. In the environment shown the lecturer as a normal person may giving a lecture as usual regardless pay much concentration to the students with disability. The lecturer may not have a special skill concerning their disability. It is vital for lecturers to deliver theirs lecture without any interrupt and delay. In the lecturer computer equipped with flexed e-learning system, the lecture is first converted in to text form before delivered to student computers. Thus, there are three types of information format, tot, audio and video received by each student over the networking utilities. The normal students can interpret the information independently. The fled e-learning system actually makes the learning process become much easy to the normal students. They can listen and view the text of lecture simultaneous which increase their understand ability. The deaf and dumb student can follow the lecture by their visual sense to the text of lecture and reply to everyone by typing text in the chat room format. While the blind student can listen the lecture by their hearing sense and reply to everyone using a microphone. Actually, in the blind student computer, an additional text to voice converter software is installed so that they can listen to what the deaf student says. The blind student replies to deaf student by using the microphone. All the information in audio format will convert to text format using voice to text converter before deliver to deaf student. The spastic students which have motion disability still have the ability of visual and hearing. Their movement is very slow compared to normal students. That is why this flexi e-learning system is designed to assure the learning process done as i as possible. The student does not need to take down the note of lecture because their can save the lecture in video, audio and te format. The students especially spastic do not need take much movement to follow the lecture because everything is available to facilitate them. The disabled students also can communicate between each other regardless their ability. The lecturer is able to give the lecture freely without any interrupt from a This education for all system is to ensure that all students regardless factors. their ability to exercise their right to have a proper education and behave independently without any discrimination.

In this section, we will demonstrate the fled e-learning system from lecturer side to student side. First of all, all users that wish to use the voice to text converter must let the computer familiar with user speaking. This is called user-training section. This section allows the software analyze and capture the user speaking tone so that this software will adjust and familiar with user pronunciations in order to perform as accurate as possible. The user will be asked to read the sentences provided as accurate as possible in order to pass this training section shows the half process of user-training section. After finish this process the user will be asked to save it as a user profile for the future use. Hence, all users only need to select their profile each time they wish to use it without does another training.

All users, both lecturer and student sides will be asked to login when running the flex e-learning system. After logon the system will become active. There are video conferencing among the users, the chat room of users, and the lecturing texts display on the screen. This system is run in HTML or web format Whenever the lecturer speaks, the text of lecturing will be displayed and distributed over the internet. The student can view both video conferencing and lecturing text simultaneously at remote side The blind student can follow the lecture by listening through the video conferencing section. The deaf student can view the lecture on the displayed screen. The student that cannot attend the lecture hall can follow the lecture through internet. All lecturing material can be saved.

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The discussion among the users, both lecturer and students can be done on the chat room. The users can speak or type in the chatroom. Then, the disabled students can view or altering among all users in the chat room. Thus, it completes the bi-directional communications among both normal and disabled's Al the content of discussion can also be saved for the future us Some analyses have been taken from this fled e-learning system. The system needs a high-end computer with fastest processor and highest access memory. This is because this system is full of voice to text converter. This problem is still remaining as a hot discussion among researcher. However, Dragon Naturally Speaking software has provided 90% of voice to text conversion. This insufficiency is caused by the human speaking factor. For a normal person with high English proficiency the accuracy is improved. For the students with difficulty to speak Eke Spastic students, the accuracy percentage is decrease. Anyway, from the human psychology point of view, this depends on how the human analyze the generated text. For example, if the generated texts are "Once plus floor equal to fly" the human will know it actually means 1+4-5.

Some limitations also must be imposed in this system. This fed e-learning system is limited to disabled with not more than one type of disability. If the disabled student is blind and des then he or she cannot able access to this system. Besides that, the number of users in this system must be limited in order to have higher system performance. This number can be increased if the video conferencing section is removed. It is learned that the education level among the disabled are low due to the limitation of accessibility in editing education system. A fairness education system is necessary to everyone regardless their ability. Therefore, the presented fled e-leaming system is designed to resolve this high-motivated "Education for All issue. This system comprises of voice to text and text to voice conversions add an extra feature in the education system. With this additional element it seen be adequate to support the possibility of disabled student. In this system, the lecturer does not need special communications skill. The deaf student can view the text of lecturing, and the blind student can listen to the lecturing. The global can also follow the lecture through internet. The system is also designed to facilitate the bidirectional communications among the users. The contents of lecture and discussion can also be saved for on-demand purposes. Finally, flexed e-learning system is an integration system to form a completed multimedia system for both disabled and normal students.

Learning and the knowledge economy

K-economy is the buzzword today. In such a global knowledge economy, people have been identified as the key for success of organizations and businesses. To thrive in such an economy, organizations and businesses need to recruit, retain and update highly skilled people. e-Learning has been identified as the enabler for people and organizations to keep up with changes in the global economy that now occur in Internet time. As companies, organizations, and governments around the globe look for more efficient, dynamic ways to update workforce skills and knowledge, e-Learning is emerging as one of the fastest organizational uses of the Internet. e-Learning has the advantage of being applicable across all areas of workforce training including career development training, new employee orientation, new service or product information, or just updating and upgrading of work knowledge, competencies, and skills. By leveraging training and learning over the Internet, organizations can eliminate the need for classroom time, dramatically reducing costs and improving real time access to information.

Embracing e-Learning by organizations is not just a good idea, but it is a necessity. The national healthcare organization in Malaysia is no exception. Maximizing e-Learning will provide the support it needs to attract and retain the very best healthcare professionals, bearing in mind the "brain-drain from public to private sector phenomenon" taking its toll on an already-depleted and overworked public workforce.

In some areas, traditional sources of learning and training such as colleges, universities, and training organizations, continue

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to provide what is required. But just as the needs of organizations are rapidly changing, so are the ways that learning opportunities are being delivered. Mobile telephony, electronic simulation, interactive and modular delivery, the Internet and the Worldwide Web, and digital television are some of the more obvious examples. New learning environments are also emerging examples of which include learning centers and corporate universities. Online delivery of learning, often supported by coaching and mentoring, is increasingly becoming the norm. Online learning is allowing learning to be tailored to an individual's need. Skills and knowledge can be developed faster and when they are needed, just-in-time learning. Now that human capital has become the most important of competitive advantage in any organizational or business setting, a different strategy for learning and training of the workforce needs to be instituted. As organizations face the demands of the knowledge economy, the workplace is becoming dynamic and interdependent. The contribution of the employees in terms of their knowledge, skills, competencies, and creativity is vital not only to competitive success but also, especially in the healthcare services context, to the quality of lives of the nation's citizens Successful organizations have always invested in their people. As is well recognized, the greater the amount of learning and training that goes on within an organization, the better the performance and competitive edge. Recent evidence suggests a76% profit gain per employee in businesses which have invested in its people. As the recruitment, motivation, and retention of staff become more competitive, learning and training become key elements of the package of benefits offered to employees.

In times of great change (as in current times), learning to learn is the key skill. When organizations have to transform or restructure or just change the way they do things, learning ensures that people understand and act on their new insights. This ability to adapt and the capacity to be flexible by the workforce will ensure that services will continue even in the midst of external pressures and turmoil. It can also be seen that the half-life of knowledge is getting shorter by the day. It has been predicted that the stock of human knowledge will double every 73 days in 2020 as opposed to 5 years today. Hence, it can be anticipated that almost constant updating and upgrading of knowledge, Information, and skills will have to be ensured to keep track of exponentially increasing knowledge gains.

The emerging trends and changes in the field of learning in light of opportunities afforded by the knowledge economy include: the drive for consistently high-quality learning opportunities, the need to widen and increase access to such learning opportunities, and the rise of e-Learning. If learning opportunities are not made available to all employees, then the organization will not be able to harness the full potential of its people. The pace of change at the workplace and the constraints of having employees leave the workplace for training for prolonged periods of time have resulted in greater emphasis on reducing cycle time for learning and the implementation of knowledge, giving rise to the emergence of "just-in-time" rather than "just-in-case" learning. Using Internet- and Intranet-based learning tools, e- Learning has enabled people to learn at their own pace and at a time and venue which is most convenient to them Education and training in healthcare is an essential and continuous activity for healthcare providers. In 1996, the Ministry of Health of Malaysia spent approximately RM 91.9 million or 4.5% of its total operational budget for both basic and post basic postgraduate training. Continuing Medical Education (CME) or what is currently termed "Continuing Professional Development is deemed compulsory for all healthcare professionals, to ensure that knowledge, skills, and competencies are not only maintained but also regularly updated and upgraded. The current CME system has many unresolved problems and issues such as the high cost of establishing and maintaining physical training facilities, difficulty in meeting changing demands consequent to demographic, disease trends and knowledge economy changes as well as staff shortages in the deployment of knowledge. workers, all these arising from the relatively long duration in training and unattractiveness of rural settings. It was with this scenario in mind that the Ministry of Health came up with the CME application nested within the national

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Tele Health Project with the CME application, delivery of CME will be facilitated by online delivery, in other words, transforming traditional CME delivery into e-Learning. As in all types of working environment, but especially more so in the medical and healthcare environment where being complacent, negligent, and out-of-date with work related advances could make the difference between life or death outcomes in patients, there is a constant need to rapidly train and retrain the workforce in new technologies, products, and services found within the workplace setting. There is also a constant and unrelenting need for appropriate management and leveraging of the knowledge base so that it is readily available and made accessible to all members of the workforce within the workplace environment. In addition, within the medical and healthcare setting, certain other factors reinforce this need for constant refreshing, training, and retraining of its workforce. These factors are outlined below.

The public is no more the docile folks of yesteryear, complacently and uncomplainingly reliant on their healthcare providers for health-related matters. They now demand up-to- date information from their healthcare providers and are not so reticent about medicolegal implicated negligence on the part of their healthcare providers. In 1999, 67% of physicians, 66% of surgeons, and 80% of obstetricians and gynecologists were in the private sector. This has created unequal distribution of medical services and difficult access for communities in rural areas. An acute shortage of doctors and other healthcare professionals within the public health sector has resulted in the emergence of "multitasking" efforts from individuals and thus "forced" learning of new skill sets imposed upon them in facing deployment of these additional duties. Thus, training needs and demands of editing workforce are further increased.

Heterogeneous standards of healthcare as practiced by medical practitioners within both public and private but more so in the latter case health sectors, have necessitated policies designed to audit and streamline medical and healthcare practices This has led to the establishment of an accreditation system managed by both Malaysian Medical Council (MMC) and Malaysian Medical Association (MMA). Medical practitioners are obligated to obtain minimal credit points from accredited CME programs, which are tied up to issuance/renewal of annual practicing certificates.

Increasing complexity of healthcare services, technologies, and products has necessitated increased breadth and depth of training programs Globalization and increased access exposure to information has also increased the natural satiety level of the workforce for information and knowledge. The Telehealth Initiative has been able to identify these added demands being placed upon the traditional training system within the Ministry of Health and was thus able to preempt the issue and offer effective solutions.

Perhaps a short introduction to the Telehealth concept is required for those not familiar with it. A good point to start off would be the National Health Vision, which is stated as follows:

Malaysia is to be a nation of healthy individuals, families and communities, through a health system that is equitable, affordable, efficient, technologically appropriate, environmentally adaptable and consumer friendly, with emphasis on quality, innovation, health promotion and respect for human dignity and community participation towards an enhanced quality of life. It is in pursuit of this National Health Vision that the idea of the Telemedicine Project or what is more popularly called the Telehealth Project, was conceived. On reaching the threshold of the new millennium, and still unable to achieve the aspired-for "health-for-all" premise for that new century, a new strategy and approach is deemed mandatory. Telehealth was envisioned as the enabler for that vision, harnessing in its wake the full power of information and

multimedia technologies for public good while empowering the public, community, and healthcare providers with appropriate knowledge and skills to ensure an optimal state of health for all involved.

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