



Virtual Training Room Management System for RT Lawrence IT Consulting Firm

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Abstract— *The purpose of the Online Training Room Project (iTeach) is to provide a platform for RT Lawrence IT Consulting Firm to experiment with designing spaces for learning. The project aimed to provide an alternative teaching and learning approach to optimize trainees' involvement and interest while helping them to achieve learning outcomes. This will motivate and invite the IT Trainers to design and build their ideal learning space for use as an online training room in iTeach or as a prototype for a real-life training room. The project showcases learning techniques and shows fast phases of training through the use of computer technology evolving in the modern world. Through this innovation, both trainers and trainees benefit on a different perspective and view of learning online wherein saving time and cost management are highlighted. The project is considered as an interesting trainee - centered approach that will help the trainer focus on learning styles and techniques as with the conventional teaching and learning methods. Computer functionalities like interactivity, multimedia, accessibility, and usability are the keys to achieving an effective online training room.*

Index Terms— *IT Consulting Management System, Virtual Training Room, Online Learning, Computer-based Learning, Educational ICT*

I. INTRODUCTION

Evolution of computers is inevitable. It provides answers to the complicated and complex problem of people. Computerization is almost in every sphere of field and industry and enables users to practically adapt its technology for further search for learning and knowledge.

Technology has changed the business, industry, educational environments, and government ways of conducting training. Training had always been bound to the four corners of a training room based on the definition of traditional teaching method.

When comparing learning as an identical course in a traditional framework to a computer- based learning framework, trainees have expressed higher satisfaction from the computer assisted learning, and rated the technique as more effective than in the traditional framework. It was argued that computer mediated or online learning is more effective and interactive. Findings of research conducted in the seventies and eighties, comparing the use of computers as a learning environment to traditional teaching, also indicated a slight improvement in the trainees's achievements following use of a computer. (Turrof. 1992)

Computer- mediated learning or E – Learning includes many components that are familiar from traditional learning such as presentation of ideas by the trainees or students, group discussions, and arguments.

The contents of the training course might be organized according to subjects and in a serial manner. E – Learning also includes advantages which are not found in traditional learning, such as: time for digesting the information and responding, enhanced communication among the trainees, both as quality and as firmness, knowledge being acquired and transferred among the trainees themselves, the ability to conduct an open discussion, where each trainee gets more of an equal standing than in a face-to-face discussion, access to information and to discussion ability, responses may be made around the clock with no restrictions, a higher motivation and involvement in the process on the part of the trainees. (Rashty. 2002)

E-Learning could be great help because of the drill-and-practice, tutorial, or simulation activities offered either by IT or as supplements to traditional trainer- directed instruction. Study show that computer software provides many instructional benefits and computer-assisted instruction (CAI) which can have a much greater impact on trainees' learning capacity. In a classroom utilizing CAI, trainees often work independently or in pairs at computers inside the room. CAI effectively guides trainees through a series of interrelated activities and instruction, addressing a variety of learning styles.

As a response to the changes in teaching strategies, Mentors and I.T professionals have teamed up to give rise to a new form of knowledge transferring tool called Online Classroom. Its concept is adapted for the development of this Virtual training Room - a system that provides the same opportunities for the teaching and learning process beyond the physical limits of the traditional classroom's walls, through the use of computer communication networks. Due to the ubiquity and popularity of the Internet, most Virtual Training Room implementations are Web-based. In today's

technology, the expression Web-based classroom, Online Classroom and now Virtual Training Room can be considered synonym.

Some of the benefits of a Virtual Training Room is its being platform independent, simple, and has consistent interface in order to fully understand all its functions. Additional to that are the use of the computer processing power and the systematic design if instructions to mediate and deliver effective information, creation and distribution process of instruction.

RTL Consulting Firm is a Total Payment Processing Corporation specializing in In-House Remittance Solutions, Lockbox Solutions (Payment Processing Services, Disaster Recovery Solutions, etc) and Electronic Payment Solutions (Credit Card and Merchant Solutions).RTL provide solutions to a variety of industries including: Non-Profit, Insurance (Auto, P&C, Health, etc.), Government, Utilities, Fulfillment Houses, Newspaper/Print companies and more.

RTL provide solutions throughout the US and Canada. The offer solutions that are scalable to fit any business environment from the small to the largest in the country. RTL is in IT Consulting business since 1992 and providing payment solutions for over twenty years. It has a fast-growing branch in the Philippines. The local branch here employs all-Filipino workforce, however, trainings regarding the intricacies of business operations and daily transactions are still given by its main branch in California. Thus, this iTeach Virtual Training Room Management System is indeed of great help to the company.

In order to be globally competitive, RTL promotes technological innovations especially in terms of providing training, the use of a Virtual Training Room as a new teaching strategy will add to the strength of the training core being implemented to trainees. It can promote new training methods that will fit the training course or track that is being served by the RTL.

One of the objectives of RTL is to expand its wings on introducing new technology and solutions to its clients' technical problems, the researchers developed iTeach – A Virtual Training Room Management System.

The general objective of the study is to develop A Virtual Training Room Management System that will provide contents and directives used as a standard tool to assess the trainees' abilities with proper instructional design for the RTL. It specifically aims to: (1) To develop an E-Classroom with (a) Online Activities (b) Online File sharing for academic purposes (c) Live Discussions and Inputs (d) Assessment Modules (e) Board (f) Groups; and (2) determine the software and hardware requirements needed to develop iTeach ; (3) To determine the acceptability of the Online Classroom System based on ISO 9126 characteristics.

II. METHODOLOGIES

This part presents the methods of research followed and applied by the researcher that are relevant to the study.

The researcher used Rapid Application Development (Fig. 1) to ease the need in time consumption wherein, members must be able to comply with the method's principles.

Outsourcingdotnetdevelopment.com define Rapid Application Development (RAD) as “a software development methodology that intends to decrease the time taken to design software systems.” The RAD approach includes developing and refining the data models, process models, and prototype in parallel using an iterative process. User requirements are refined, a solution is designed, the solution is prototyped, the prototype is reviewed, encourages constant feedback from users by keeping lines of communications clear, user input is provided, and the process begins again until the IS exhibit the user requirements. Usually a technique called Prototyping is applied on the software development methodology (Gordon & Bieman, 1995).

Prototyping is a technique for building a quick and rough version of a desired system or parts of a system. It allows users to try out the system and detect problems of flaws. Prototypes are very useful when the information requirements are not fully understood. It can be used to explore and solidify the functions and design.

The main objective of Rapid Application Development is to avoid extensive pre-planning, generally allowing software to be written much faster and making it easier to change requirements. It is a merge of various structured techniques, especially data-driven information engineering, with prototyping techniques to accelerate software.

Since the project was given with a timeframe, the methodology that the researchers used was applicable and specific in pointing out project scope and limitations (handsintechology.com).

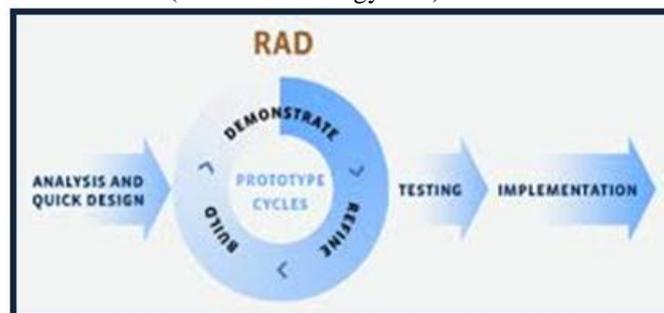


Fig. 1: Rapid Application Development Model (Source:techieszone.com)

Evaluation Instrument

The system was evaluated based on Functionality, Reliability, Usability, Portability and Speed. The system was evaluated by 18 correspondents including Ten I.T Professionals, 8 trainees from the RTL. With the use of the 5 – point

Likert – type Attitude Scale, the researcher were able to determine the acceptability of the system in accordance to user needs.

Table 1 Likert – Type Attitude Scale

Numerical	Equivalent
5	Excellent
4	Very Good
3	Good
2	Fair
1	Poor

Table 1 shows the assessment regarding the system’s performance, the researchers used the Likert – type Attitude Scale having a numerical rating from 5 as the highest and is Equivalent to Excellent to 1 as the lowest with Poor as it’s equivalent.

Data Gathering Procedure

Gathering of data was one of the major steps that the researcher did. Interview and observation are some ways of gathering data. The researchers used these methods of data collection for the reason that the method itself is reliable and are easy to explain through key questions. The researchers conducted an interview to some trainers and trainees of the RTL to know what is basically the training method currently applied to the firm and if these methods were effective.

Another is the observation on the flow of the traditional training, and since one of the researchers became a part of the RTL even just for a short period of time, the opportunity to be able to assess the current system is an advantage. Interview and observation were not just the only method the researchers used. An evaluation sheet was distributed to test and check if the system functions are acceptable to its users. There are 10 I.T. Professionals from various IT companies made an evaluation on the system to check if the system were able to meet the industry standards. Parallel to the I.T. Professional evaluation, the researchers also conducted an evaluation to trainers and trainees.

Table 2 Reference Table to obtain Mean Value Scores

Weight Score	Descriptive Rating
4.50 – 5.00	Excellent
3.50 – 4.49	Very Good
2.50 – 3.49	Good
1.50 – 2.49	Fair
1.00 – 1.49	Poor

Table 2 represents the weighted scores and descriptive ratings from the evaluation instrument for the evaluation for the assessment of the system according to the criteria given: Functionality, Reliability, Usability, Portability and Speed.

System Evaluation

Descriptive presentation is based on the feedback and views from the system’s respondents. There are ten IT experts, ten trainers and thirty trainees who evaluated the system. These respondents are the one who rated how functional and whether the system has the features that a Virtual Training Room must be able to showcase. The researchers were able to achieve the proper feedbacks to know the best ideas on how to approve the system.

III. RESULTS AND DISCUSSION

This part discusses the developed system, its principles and concepts, how the system works, what are the present functions, as well as physical environment and architectural design.

iTeach is a Virtual Training Room Project that targets the trainees of RTL to provide innovative teaching styles and promote further interest by learning the technology through technology itself.

The project enables both trainees and trainers to engage in a virtual environment but not sacrificing the traditional techniques as seen in a typical physical room – based training.

System Functions

The system is specifically designed to level-up traditional Training Room tasks into automation. The project is divided into major users, the trainers and the trainees. Trainers can create a lesson, activity, and examination. The trainer is also subject to manage a group should be able to participate in group discussions. The trainer has the authority to set if a certain lesson file or examination can already be accessed by the trainees. Trainees can join a group that is being managed by the trainer and participate in group discussions as well. The Trainer also has the privilege to upload files and set if visible to trainees for download as another resource.

System Features

1. Logging In and Out, Activating an Account, and Profiles
 - 1.1 Users must be able to log in and log out.

- 1.2 Users must be able to activate account through a pass code
- 1.3 User pass code must be sent through email.
2. Content Management
 - 2.1 Site contents such as Announcements, Course Lists and about should be dynamic.
3. Evaluating site contents and tools
 - 3.1 Trainers must be able to perceive the first step after logging in the account which is to manage a group that will serve as a class.
 - 3.2 Trainees must be able to perceive the first step after logging in the account which is to join a group in which permission from the trainer should be given.
 - 3.3 Trainers must be able to design lessons, activities and examinations.
4. Reviewing Groups
 - 4.1 Trainer must be able to enter a designated group through a pass code from the administrator.
 - 4.2 Trainer must be able to create a group password in order to filter the official trainees who are expected to be members of the group.
 - 4.3 Both Trainers and Trainees must be able to participate in group discussions.
5. Trainees' Scores and Grades
 - 5.1 Trainees must be able to view recorded grades according to subjects.
 - 5.2 Trainers must be able to view the recorded grades of the trainees according to class.
 - 5.3 Trainers must be able to see whose trainees have completed an activity through recorded grades and scores.
6. User Discussions
 - 6.1 Trainers can send and receive messages like inbox and sent items.
 - 6.2 Trainees must be able to send messages to trainers as an extension of a more personal approach.
7. Users and Functions
 - 7.1 System Administrator
 - 7.1.1 *Back – up Database* – System Administrator is the one who is responsible for retaining and maintaining servers. They ensure that servers have backups, and server data are secure from unauthorized access.
 - 7.1.2 *Add Administrator Account* – System Administrator has the authority and power to add an Administrator account that will provide the iTeach basic operations.
 - 7.1.3 *Restore Database* – In case that there are problems or accidents regarding system information, the system administrator should be able to cater a feature that will help the system to roll back some system changes.
 - 7.2 Administrator
 - 7.2.1 *User Maintenance* – The administrator can update an account, add trainer account, deactivate trainer account, add and edit student information. The administrator has the right to do some changes and manage accounts.
 - 7.2.2 *Announcements and Events* – iTeach allows the administrator to make announcements and events wherein it can be used to inform trainees about upcoming important dates or event among other things.
 - 7.2.3 *Create Groups* – The administrator can create a group that will serve as a classroom where trainees can post responses to issues and answer specific questions that the trainer needs to read and react to. It is an ideal forum to discuss a controversial issue extensively.
 - 7.3 Trainers
 - 7.3.1 *Supervise Class Group Security* – As the administrator of a certain group, the trainer will be able to edit the settings applied to the group, including the password and its visibility to the public. Trainees who do not have the password given by a trainer are not allowed to enter the classroom.
 - 7.3.2 *Create Group Announcements* – The trainer can post an announcement to groups like assignments, deadline of submissions, date of quizzes and examinations, and posting a new lesson.
 - 7.3.3 *Class* – The trainer has the right to manipulate the class group, and in the case, the trainer will be the modulator of the class. The trainer also needs to set a password, wherein this password will serve as a permission ticket before they can enter to the class group.
 - 7.3.4 *File Sharing* – The trainer can upload and share tutorials, picture and videos, where trainees are allowed to download. File sharing will help the trainees get an instant reference that will help them easily understand the lessons.
 - 7.3.5 *Examinations and Activities* – The trainer is the one who is responsible in creating examination and quizzes. Course and subjects has database for examination questions. Trainers load the question through forms and pages that will be saved into the database to create records. The exams and questions can be updated, deleted, and re-used anytime.
 - 7.3.6 *Examination and Activities maintenance* – The trainer can customize different types of examination formats like multiple choices, matching type, true or false, definition of term and the like.
 - 7.3.7 *Class Record* – The class record specifically works the same with the traditional process of recording grades, but instead of writing it, the system enables faster input and access.
 - 7.4 Trainees
 - 7.4.1 *Download Additional Lectures and Tutorials* – Trainees can download additional lectures and tutorials uploaded by the trainer directly to the computer that will serve as added references even if not connected on the internet.

- 7.4.2 *Messages* – The trainees can send messages to the trainer and also receives messages. This enables the student approach the trainer in a way that is more personal than being in the live group discussion for questions and ideas.
- 7.4.3 *Class* – Trainees must have a password given by the trainer before they can join the class. This Once the student accessed the class, trainees are expected to still participate online even without the presence of the trainer. The Internet makes it possible for the trainees to ask questions and receive the answer back almost immediately through the help of live group discussions.
- 7.4.4 *Examinations and Activities* – The trainees are not allowed to take an examination unless the trainer already gave permission. Every student has different sets of questions but having same contents. The tests are randomly arranged to avoid cheating.
- 7.4.5 *Scores* –iTeach generates a report that shows all the scores of the trainees. Since the system is web-based, the trainees can just browse scores over the internet and print.

The Interface

The user interface is developed using Hypertext Preprocessor (PHP) supported by Cascading Style Sheets (CSS) and JQuery that functions as well as with Java Script. The database used is MySQL 5.0 to eradicate the issues of multiple accounts that can be processed using the system.

The concept of having a green minimalist design was inspired by a chalk board that somewhat signifies study, lessons and activities in school. This provides a clean look and feel to help trainees navigate in the whole system.

The website URL is www.cict-iteach.com and the accounts to be used is for the administrator, trainer, and the trainees of the College of Information and Communications Technology, Bulacan State University. The password for each account is delivered through a sent e-mail and can be retrieved that will play as the default account key to enter the site.

The following figures show the interface of some of the major features and functionalities of the system.

In Fig. 2, users will input their authentication credentials. If the account is then verified and is compared with the database regarding the user type, the system proceeds.



Fig. 2: Secured Log-in Page.

Fig. 3 provides links for the trainer’s tasks such as announcement, messages, my classes, profile and log out. This page also allows the trainer to enter trainer’s class page. In the Trainers homepage, the list of classes are presented, if the classes are clicked, the process will direct to the trainer class page. The announcement tab is visible, it will load the announcements and clicked, the process to undergo will be viewing the trainer announcement page. In the Messages tab, the messages will be loaded and will directed to the Messages page, if not, the trainer can proceed to another tab, which is the My Class tab wherein, it loads all the lists of the classes in the college, and clicking in one of the respective class will direct to the Trainer Class page

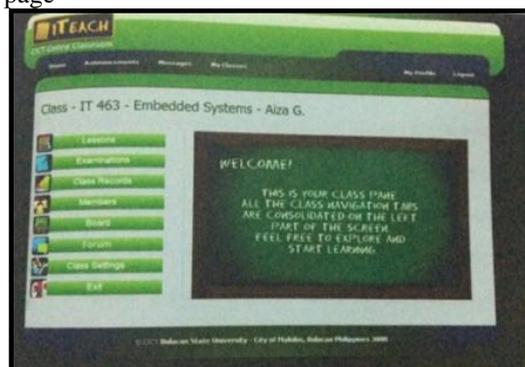


Fig. 3: Student Home Page.

Fig. 4 shows the student home page. It composes of six tabs – home, announcements, messages, my classes, my profile and log out. In the home page will see the lists of classes where the student is currently a member as well as the other classes available for the student.

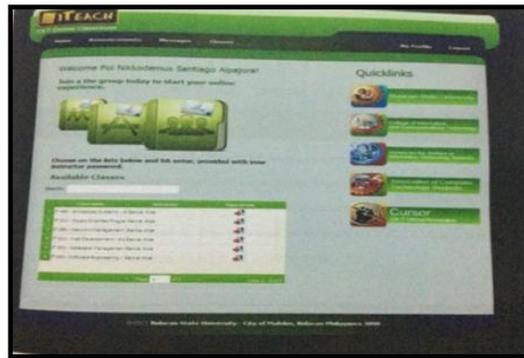


Fig. 4: Trainer’s Home Page.

Evaluation Results

Table 3 shows the summary of the evaluation result conducted by the researcher among the selected respondents. An average of 4.29 interpreted as Very Good means that the system really meets the requirements set by the end users, and that the desire functionality and reliability of results was achieved.

Table 3 Overall Mean Rating of the Developed System

Criteria	Averaged Weighted Mean	Interpretations
Functionality	4.33	Very Good
Reliability	4.02	Very Good
Usability	4.59	Excellent
Portability	4.17	Very Good
Speed	4.33	Very Good
Total Rated Mean	4.29	Very Good

IV. CONCLUSION AND RECOMMENDATIONS

For every line of institution, quality education and learning techniques are the priorities. This enables the body to pursue the career chosen by those individuals whose goal is to be successful someday. But with the years passed by, the competition and influence of technology in education greatly raised especially the internet, with its excellent manifestations, teaching was brought into its next level.

The thing is that, traditional classrooms are effective and has proved to be one of the most operational systems to provide when it comes to teaching. Lessons are being fed to the trainees through the classic write-on-the-board techniques, copy-this-and – that strategies and paper – based questions and answers. Live interaction between the trainer and the learner is present as well as discussions. But being part of the emerging modern world, teaching strategies and style should be enhanced.

The results of the evaluation shows that majority of the respondents agree that the system will be helpful more especially if it will be implemented.

The researcher recommends that the users of the system shall be aware of the advantages and disadvantages of the internet and be mature enough to know what is right or wrong. Training to high – level users such as the administrator should be forcefully advised. This is important because the whole and core process lies within the hands of an administrator, that is why, familiarization to the system is recommended.

For further developers who may in turn, want to upgrade the system features, the researchers highly recommend enhance the examination process and flow, provide a more comprehensive lesson distribution and user information.

It is also recommended that the percentage of the quizzes and examinations in the reports will be more accurate and less questionable. It is best to lessen the manual works of the trainers in providing the scores of the trainees in a certain group.

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