



**COURSEWARE FOR SELECTED COMMON COURSES OFFERED IN
THE INSTITUTE OF COMPUTING STUDIES ISPSC STA.MARIA**

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Chapter I

INTRODUCTION

Project Context

Technology is now being integrated in class curricula and more online courses are offered in many educational institutions by means of educational courseware. This may sound impractical to implement in every teaching institution but that is one way to recognize how technology could positively affect student's learning.

The word courseware is a combination of the words course and software. Courseware was used to describe additional educational materials intended as kits for instructors or trainers, usually packaged for use with a computer to be used by students. The term courseware was also used in reference to an online or 'computer formatted' classroom. It can be used in an online format or stand-alone format. For teachers and trainers, courseware content may include set-up information, a course plan, teaching notes, and exercises. They tend to bring the teaching-learning process to another level in contrast to the traditional way of teaching. Information, computation, and multimedia are three popular components found in educational courseware wherein instructional design considerations are being applied to each one of these components to ensure learning has indeed occurred.



Courseware can encompass any knowledge area, but information technology subjects are most common.

The Institute of Computing Studies at ISPSC, Sta. Maria, Ilocos Sur offers 2 bachelor degrees, namely, Bachelor of Science in Information Systems and Bachelor of Science in Information Technology. Introduction to Computing and Programming 1(JAVA) are the common courses in the Institute. These courses are being taught in a traditional classroom lecture with a twist of modern technology evident on the usage of power point presentation of the lessons in front of the class and having hands on computer activities from time to time. Integrating these courses into a courseware would somehow improve the teaching methods of the ICS Department. Being the department who offers computer courses, the integration of technology in teaching-learning process should start with ICS.

Introduction to Computing is a course which allows the student to learn everything there is to know about a computer technology, its importance and its existence in our daily lives. Computing being defined as the process of utilizing computer technology to complete a task. It may involve computer hardware and/or software, but must involve some form of a computer system.



The importance of learning Programming using JAVA lies with the fact that it is one of the most sought-after programming languages today and has been the prime choice of the most skilled developers.

With the researchers' observation, the traditional way of teaching in school merely fits the need for the computer courses to be taught. Traditional way of teaching includes using textbooks or modules, writing lessons on the board, taking notes while the instructor reads the lesson, still taking quizzes, activities and exams in papers. This observation encouraged the researchers to propose a system that might facilitate a more interesting and interactive learning-teaching process. Information that an instructor will need to convey to his students will be easily delivered and interpreted by the use of a system like a courseware. It will also be efficient because as the instructor, he will just have to distribute a copy of the software to the class, or implement it in a network-based architecture of computers. Teaching-learning process smoothens because of the improved interaction which proves that learners learn faster, and have better attitudes toward learning when using interactive courseware.

This system will benefit students in a way that it will improve learning because it was found that "learning was higher when information was presented via computer-based multimedia systems than traditional classroom lectures. It takes less time and can be enjoyed



more." Students' proper understanding of concepts will be improved because they will just depend on themselves. So it will also encourage exploration and even below average students will be curious and will look for answers of problems or situation that they encountered with a certain courseware, but of course, they can still ask questions from the instructor if needed.

Purpose and Description

This study aimed to develop a courseware for teaching Introduction to Computing and Programming 1 utilizing the JAVA language that will shed light to the development of educational tools that are relevant to the changing needs of time; hence it will be beneficial to:

ICS Department. This system benefits them in terms of attracting more students to enroll the course Bachelor of Science in Information Systems and Bachelor of Science in Information Technology, because this creation symbolizes an advancement of the teaching methods of the institution.

Instructors. This serves as storage of lessons. It will help them in easier way of teaching, by capturing their students' interests.

Students. The students benefit most on this system. The interactive format and the entirety of a computer based educational material might get their interests and this might also help them in a way of spending less time going to the library and saving money in buying books.



Researchers and Future Researchers. The researchers benefit from the background information based on the result of the study and serves as a basis to the study that the future researchers will be conducting.

Statement of Objectives

This study aimed to develop a courseware for Introduction to Computing and Programming 1(JAVA) that will be used to facilitate a better teaching-learning process in ISPSC's ICS Dep't, Sta. Maria, Ilocos Sur.

Specifically, the researchers aimed the following:

1. to assess the current system being used in teaching Introduction to Computing and Programming 1(JAVA) in ISPSC ICS Department;
2. to identify the most viable online Learning Management System to be used;
3. to develop learning courseware which would comprise of modules of Introduction to Computing and Programming 1(JAVA);
4. to evaluate the usability of the Courseware for Introduction to Computing and Programming 1(JAVA) along
 - a. Usefulness;
 - b. Ease of Use;
 - c. Ease of Learning;
 - d. Satisfaction;



Scope and Limitation

This study focused on the development of courseware for the subjects Introduction to Computing and Programming 101 focusing on JAVA language which are included in the list of common courses being offered at the ICS Department of ISPSC-Main Campus, Sta. Maria, Ilocos Sur, on January-May 2017. The system is an online-based courseware which was uploaded in Moodle which is a Learning Management System. The courseware contains assessments such as assignments, quizzes and examinations. The chosen Learning Management System utilizes and uploads function to cater inputs from the students. It is capable of giving results of assessments taken by the students. Internal IT experts and BSIS and BSIT students will be the respondents of the usability testing of the system.

The system is not capable of computing the grades of the students.



Chapter II

REVIEW OF LITERATURE

Courseware

The study conducted by Tan, et al. (2016) was able to evaluate the usability of a courseware in Home Economics with the following criteria; usefulness, ease of use, ease of learning and satisfaction. The mean score for all the areas evaluated is 4.29 with a description of strongly agree. The highest mean was 4.31 with a description of strongly agree which means that the user finds the system very useful. While the lowest mean was 4.25 with a description of strongly agree which means that the system satisfies the need of the user.

Multimedia courseware is one of the solutions in dealing with students' differences in learning styles and knowledge background since it integrates media elements that can engage human information retrieval methods which are visual, auditory, reading and kinesthetic. In reality, not all multimedia courseware in the market are suitable and usable for the users. Hence, the users must be sure that the courseware has been tested and verified by the developer in terms of its effectiveness for delivering the subject to the learners which is the main criteria of accepting a new courseware. Define effectiveness as how good a product is at doing what it is supposed to do. Referring to the meaning of effectiveness, identifying the goal of a particular subject is the very first



task in evaluating effectiveness. In the education context, the new multimedia courseware and aided learning tools are intended to boost the students' understanding as well as their performance in particular subject or topic. (Noordin, Ahmad, & Hooi, 2011).

Like all other academic digital resources, open courseware initiatives face substantial challenges in developing successful models for long-term sustainability. Lauded for their efforts to expand access to elite classrooms, these projects now find themselves at a critical juncture.

The first such initiative launched in 2001, when MIT announced its landmark OpenCourseWare (OCW) project to publish versions of nearly all its courses online. Nearly a decade later, hundreds of open courseware projects now operate at colleges and universities around the world. Often begun in better economic times, and initially funded by foundations committed to the principle of open educational resources, these efforts now risk being seen as luxuries that are no longer affordable in an era of spending cuts. Within the tight-knit field of open courseware, none of this is news. Sustainability is a perennial topic of conversation among project leaders and funders and has long been a subject for conference discussions, a field to be filled in on grant applications, and a general source of anxiety for all involved. Joel M. Smith, Carnegie Mellon's CIO and principal investigator for the university's Open Learning Initiative (OLI), has said that members of the open courseware



community often “try to have a meeting about sustainability. (Walsh, 2011)

Computer-based learning these days has been recognized as an effective instrument that can help both teachers and learners in various levels of education. It has been increasingly used not only for teaching and learning in normal class setting, but can also benefit in assisting slow learners’ in their learning as well. One of the well-known multimedia learning applications is multimedia courseware. Numerous studies on developing multimedia courseware for special education learners have shown great advantages in improving and facilitating their learning. Study conducted stated that there is a good match between multimedia technology and learning needs of children with learning disabilities because presentation of information via multiple forms allows them for multiple exposure to the same information. However, to ensure the effectiveness of any multimedia learning that is developed, evaluation must be conducted. Usability evaluation have become an important act in order to ensure the learning resources developed has been designed appropriately in order to facilitate effective learning.(Abdollah, Ahmad, & Akhir, 2011).

Computers used to be the main device for accessing the internet, but tablets and smart gadgets are taking the lead. Nowadays people use a variety of mobile devices, depending on where they are and what they



are doing. Portability and easy access have become crucial factors for internet users. Some people may not have the most technologically advanced devices or the latest software versions that can support such activities. The point is to make learning easier and engaging, not to make it more “distant”. Some people may not really know how to use this kind of technology and how to benefit from it. Furthermore, eLearning providers themselves may become overwhelmed by the abundance of options and will need to be open to change. They should select the technology that fits their business and learning goals before offering it to their learners, (Kalamara, 2015).

Learning Management System

As stated by Shah (2015), blended learning is possible through the use of learning management systems. Blended learning is the combination of multiple forms of learning including simulation-based learning, e-learning, mobile learning and even classroom-based learning. This is because of the fact that a Learning Management System is a central repository for all the modules and materials. As for an organization, LMS can ensure consistency in the delivery of the materials from the formulation to the evaluation of the system and it is capable of simplifying the learning process and procedures to make it more responsive to the client’s specific needs and wants. It will be easy for new users to figure out the system and through the platforms scalability, learning modules can be adapted depending on present and future



requirements. And the bottom line is: The learning rates of employees, managers, and executives significantly improves through the use of Learning Management System and with the knowledge and skills they acquire, the more profitable and productive the company as a whole can be.

Edmodo is believed to be an excellent choice for expanding digital learning in the K-12 classroom. First of all, it's free. They generate income through in-app purchases and venture in funding capitol. It is multi-platform and device agnostic so it both available for iOS and Android in mobiles. It is a safe environment for kids because it has no advertisements which can potentially disrupts the students while learning and expose them to whatever there is on the web. It offers learning aids like Quick Guides and FAQs so it is easy to learn and use. Edmodo is an LMS which is a great platform for blended learning. It also facilitates various types of Active Learning such as providing assignments and related resources, have discussions about them and collaborate in defined groups. Edmodo's security, mobile accessibility, and its ability to have private online class discussions around posted content makes it a great flipped teaching delivery vehicle. It even allows parents to sign up and be involved in their children's learning without going overboard and still respecting the teacher-student relationship. Edmodo also provides real-time analytics if for example, the teacher wants to know how many students logged in. (Walsh, 2013)



Faculty and students are the primary learning management system users but administrators and IT experts often select the system. It is also vital to involve the stakeholders in the selection process so that they can align it with their institution's instructional and learning priorities. Also, introduction or change in a Learning Management System requires collaboration among IT personnel and the academic staff. There is also a need to consider the needs of the students. So the institution must become familiar with advantages and disadvantages of the software. There is also a need to establish an LMS-selection committee, a decision-making process and selection criteria: and these criteria must be applied to determine the most appropriate LMS, given the characteristics of each institution and its faculty and student body. Implementing an LMS can result to substantial expenditures of time and money, so you must consider the cost on investing into one. Once an LMS is installed, it will become the most valued software because of the possibility that it will become a mission-critical system that faculty and students will depend on 24/7. Thus, it is very important to carefully examine the short and long term effects of its implementation. (Schmoller, 2014)

According to Foreman (2013), buying or implementing a Learning Management System is not easy. There's a better chance for success and satisfaction if you follow proven practices in evaluating and selecting an LMS. The risks of breakage from selecting the wrong solution is as



significant as the investment of time and cost that organizations make in LMS. Hundreds of LMS are available at the LMS marketplace which is always changing and evolving. A product that is more suitable to your organization's needs is probably out there if you already have an LMS which you are not satisfied with. In the new research of eLearning Guild, responses to survey suggests that the process an organizations uses in evaluating and selecting an LMS can have a significant impact on the success of LMS implementation. Generally, there are five major steps in evaluating and selecting an LMS. These include needs analysis, requirements definition, product vetting, product evaluation and product selection. These steps should be practiced in order for an organization to select the most appropriate product that is suitable to their needs. Without adequate investigation of the operational, strategic and technology drivers for their product choices, organizations too often make poor technology decisions. Stakeholders and sponsors should conduct a thorough analysis of the needs of the organization to be able to create a big-picture view of your learning management system needs.

Usability

The study conducted by Noordin S, et al. (2011) was able to evaluate the usability of a multimedia courseware integrated with a 3-dimensional model with the following criteria; effectiveness, efficiency, utility and learnability. The mean score for all areas being evaluated is



3.43 which signify that the courseware is above the average score, and well accepted by the users. The lowest score for this courseware is on the utility criteria while the highest score is on the efficiency of the courseware. The scores for effectiveness and efficiency show the positive impact of the 3D model, and the multimedia courseware on the students' performance. Also, based on users' feedback, 12 out of 30 students thought that 3- Dimensions model is the most special feature in this multimedia courseware. The positive response given by the users on effectiveness usability criteria and 3D model indirectly indicates the potential of this courseware for motivating students to learn this topic. This also signifies the positive impact of this courseware for the students, whereby it is one of the criteria for an effective aided learning tool.

The study conducted by Tosho, Mutalib, & Salam (2014) resulted in an issue of enhanced courseware usability choice that was raised by several respondents. The usability design setting gave an extended opportunity to improving the use of the courseware application after the e-learning implementation. Another comment about enhancement of usability choice is noted in the following expression. International Journal of Computer Applications (0975 – 8887) Volume 105 – No. 17, November 2014 34 “When you are sitting in a classroom, you don't always get every single message, and you still have the opportunity to learn it by accessing the courseware via internet and find all the information you need” The respondents also expressed the view that they



had gained insights into courseware activities that they could not have achieved without the direct experience with the distance learning activities. The respondents expressed a general satisfaction with their courseware teaching experiences. The advantages of flexibility, convenience, enhanced learning are also reported.

With the study of Hassan & Ali (2015), the analysis of the Courseware with Linear Program-Controlled Feature was carried out through questionnaire feedback. The analysis was not only limited from the physical aspect but also covered the overall performance, especially the usability and user satisfaction when using the courseware as an instructional medium. In order to evaluate the usability and user satisfaction evaluation was conducted once the design and development process was fully completed. The quantitative data collected through usability and user satisfaction test. The descriptive statistic was used to determine the mean values and the standard deviation for each item. The students agreed that the learning process had become easier to understand, especially concerning abstract topics such as operations of the OSI Model ($M = 4.5$, $SP = 0.8$), the basic techniques involved in the maintenance of the computer networking system ($M = 4.3$, $SP = 0.9$) and the peer-to-peer communication process ($M = 4.6$, $SP = 0.8$). This is because the arrangements of the contents in animation form were clear and well structured ($M = 4.4$, $SP = 0.8$). The finding provides evidence that the development of the courseware is seen as being very effective



and has managed to attract the student's interest to further explore teaching International Journal of Information and Education Technology, Vol. 6, No. 9, September 2016 724 International Journal of Information and Education Technology, Vol. 6, No. 9, September 2016 725 contents concerning the OSI Model. This has been proved by several studies, which have shown that using dynamic animation is better compared to conventional learning. This courseware has elements such as the ease in teaching and learning through animation, aspects of motivation, a dynamic and interactive functional design and the priority towards technical aspects that enables it to be used on any computer with differing versions of operating systems.



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