

Self-Directed Learning in a Graduate Web Application Design and Development Course

Nayana N. Chintawar
(ME) CSE 1st year
Jagadamba College of
engineering yavatmal

Sachin A. Murab
Assistant Professor
Department of Computer
Engineering
JCOET, Yavatmal

Mangesh M. Ghonge
Assistant Professor
Department of Computer
Engineering
JCOET, Yavatmal

Milindkumar V. Sarode
Head of Department,
Department of computer
Engineering.
JCOET, Yavatmal

Abstract:

Research has shown that adult learners can have a strong desire for knowledge for a self-directed and autonomous learning experience. This paper presents an evaluation of a self-learning approach to supporting self-directed learning employed in a graduate-level Web application design and development course. This approach allows students to define and develop semester-long team projects in an independent fashion according to their interest and suitable timing including the definition of their own grading metric and the evaluation of themselves against the measure. This paper presents the results of all the survey on student opinion of the self-directed learning approach and an evaluation of grades. Study results indicate that the self-directed learning approach used in the course was quite successful in providing adult students with an autonomous and self-directed learning experience.

Keywords

Web application, Project course, self-directed learning, software engineering education

1. INTRODUCTION:

All the learners desire to have a self-directed learning experience. In addition, this self-directed learning is a characteristic that contributes to the development of lifelong learning in students, who can gain an information through this self-directed learning approaches one of the main objectives of the criteria for accrediting engineering programs this paper reports on research into the effectiveness of a self Directed learning approach employed in a Web application design and development course with an audience of adult Working professionals, this can be Maintained by an expertise persons or a centralized server who is very professional. The learning approach used two components: a semester-long Team project where students are provided autonomy through the definition of the domain and functionality of the project; and a self-assessment component where students define their own grading metric for the project and then assess their project against their self-defined metric. A self-directed learning experience provides several benefits to students including the potential for increased learning because of a greater feeling of ownership of the learning process, an increased responsibility for participating in the learning process, an expanded ability to use a variety of techniques to achieve learning goals, and an enhanced ability to present ideas in a wider variety of forms. The employment of self-directed learning approaches also provides several benefits to instructors including greater freedom to explore material, increased satisfaction because of students having a more effective learning experience, and decreased teaching effort as the student takes on greater responsibility for learning. In recent years due to globalization of the world labor market and increased competition in all fields of economics and business, the development of a new system of education has become a very important issue. This new system

must respond to challenges of the present and rely on modern pedagogic technologies, up-to-date means of learning process informatisation and network models of learning. Starting from the end of the 20th century to the beginning of the 21st century classical pedagogy has been replaced by pedagogy implementing a new paradigm of education, which is oriented on an individual and meets Internet and multimedia has given a strong incentive to the creation of a new pedagogy and new pedagogic technologies. Today one can have the Internet access from anywhere in the world. The use of the Internet and multimedia technologies in education is becoming more and more popular among the majority of population. The advantages of computer- or web-based education over traditional classroom education include the ability to: study while at work, remain in one location with no need to travel; plan own training, attend courses across physical, political, and economic boundaries. In turn, higher education institutions obtain modern educational tools at their disposal. Distance-learning, e-learning and m-learning provide individualized learning, individual oriented approach and humanization of learning. [1]

2. LITERATURE REVIEW:

2.1:A. Self-directed learning:

It has long been recognized that an adults learn best. Because when they can appreciate the goal of their study, and have some control over the learning process. The introduction of lectures having an previous years an information on DVD gave students some control over their learning process, in that they could be choose their learning environment and pace of study, yet there are many other factors in self-directed learning which can be of great benefit to students. Allowing learners to set goals and identify expected outcomes, select learning experiences and materials, and even to determine assessment methods all contribute to help motivate adults to learn effectively. It is a very important no of keys area that are a great benefits for a graduates though whether the go on to the work place or into the further education. Certain graduates need different skills that equip them for a life time of learning. Skills that are above and beyond the Particular disciplinary skill set that is developed over the degree program. Such skills include the Ability to works in the groups, to think critically, to communicate, to locate and utilize information, and to analyze the information whatever that needs and solve a variety of problems they will come across in the course of their profession. This educational policy is mostly adopted by the university is therefore to seek to develop course programs that enable students to not only develop knowledge and abilities related to their subject area. In our case the analytical tools required for signal processing, but to continue to develop the professional Attributes that will be useful in a wide set of circumstances. In this context, employing a form of PBL Methodology in engineering education is very attractive, as by its very nature it encourages Independent thought, communication

skills, information literacy, and a host of other benefits to Students that are perhaps less tangible than their analytical mathematical ability..A self-directed learning experience provides several benefits to students including the potential for increased learning because of a greater feeling of ownership of the learning process, an increased responsibility for participating in the learning process, an expanded ability to use a variety of techniques to achieve learning goals, and an enhanced ability to present ideas in a wider variety of forms. The employment of self-directed learning approaches also provides several benefits to instructors including greater freedom to explore material, increased satisfaction because of students having a more effective learning experience, and decreased teaching effort as the student takes on greater responsibility for learning. [1].

2.2. Learning Variables

Here we identify nine learning variables that students can be allowed to control:

- 1) Identification of needs;
- 2) Selection of topics and goals for learning;
- 3) Identification of expected outcomes;
- 4) Determination of assessment methods;
- 5) Selection of documentation methods;
- 6) Selection of learning experiences;
- 7) Choice of learning materials from a variety of sources;
- 8) Structure of learning environment;
- 9) Pace of learning.

These variables provide the foundation for the goals upon which

The self-directed approach discussed in this paper is based. [2]

2.3. Related Research

Self-directed learning is rapidly being adopted by different universities for their courses in academia in an assortment of course topics that range from music to dentistry. A variety of approaches are being used to incorporate self-directed learning into courses and curricula .An approach used to transition students to becoming self-directed learners in an asynchronous learning environment in undergraduate engineering courses. The approach uses cooperative learning, team projects, student definition of grading policy, student assessment of other teams, self-assessment on a team level, and self-directed study groups. We discuss the incorporation of student-directed learning into an honors engineering course and highlights the ability to provide freedom in student learning as key to the success of the course. The main self-directed technique employed is allowing the student freedom in subject matter they can select any technology and something to be learned within the bounds of the course. Discuss the use of the techniques of problem-based learning and case studies in an information systems course to provide a foundation from which self-directed learning may occur. The techniques discussed also include the use of team projects, goal-directed learning, and instructor as facilitator. [4]

2.4: The study environment and approach:

The study was performed at a U.S. institution that provides Masters Degrees in engineering, computer science, and business to an audience of working professionals. Students are typically working full-time, technically savvy, and taking classes on a part-time basis. Students are relatively mature having an understanding of all the related knowledge and have a grasping

power to learn something. Electronic forms of communication, such as email and bulletin boards, are to be utilized to support communication. The Web application design and development course1 is part which is having an of a 30-credit professional Masters of Computer Science degree. The ten-course MSCS degree comprises two required courses having an (operating systems and computability); three breadth courses, one each from the areas of software development, applications, and theory; and five elective courses. The Web application design and development course fulfills the software development. Breadth requirement and there has been different languages serves as an elective in a four-course, graduate-level; software engineering certificate. Course prerequisites include an object-oriented data structures course and working knowledge of HTML and Java. The goal of the course is to educate graduate and interested students in the architectures, practices, and technologies used to develop a midsize Web application. Topics going to be covered different topics including Internet protocols, browsers, server technology, security, JavaScript, extensible Markup Language (XML), Servlets, Java Server Pages (JSP), and Java Database Connectivity (JDBC). Course texts are Marty Hall’s “Core Web Programming”, “Java Servlets and Java Server Pages”, and Chase’s “XML Primer Plus”. [6]

2.4.1. The Self-Directed Approach:

The self-directed approach centers upon the team project and it comprises into two main parts: the use of a student-defined project which affords students control over the content and pace where they learning. And the uses of this a self-grading approach which allows students control over their assessment mechanism and process. The student-defined an team project which allows students to select different or both the domain and their different delivered functionality of the project domain range widely and have included on-line bicycle routes; supporting for local organizations, such as different response planning sites; and on-line weather prediction. Students are also provided with the different project assignment description where they get an all the information, and a set of minimum projects standards, and a sample project description for a referring purpose, also provides an understandable or an understanding of the size and a scope of reasonable projects. This project description contains different related requirements and specifications for different projects. Which can be including a following section they are as follows? [6]

- **Domain:** An overview of the application to be developed.
- **Site Architecture:** A class diagram showing all elements in the project.
- **Site Usage Routes:** A set of use cases for the application
- **Component Details:** Detailed description of the elements.
- **Platform Details:** Description of the hardware and operating System platform on which the application will run.
- “Java shall be used to dynamically calculate a meaningful league schedule based upon each golfer handicap. This will generate the Schedule.xml file and use the Schedule.xsl file to display via the browser.”
- “User information will be retrieved from database and converted to XML using Castor, to be used in displaying a welcome message on My Account page.”

“XML and JavaScript shall be designed with reuse in mind and XML information shall be nested in appropriate levels.”The grading of the project occurs during the last class meeting of the

semester when teams present their final project. Before their presentation, each team is required to create a checklist based on of their project description. This checklist containing at least one entry for each of items in the grading portioning of the project description. Each team fills out a team checklist [6] priority to presenting their project. The instructor also fills out a checklist. After the project has been presented, the instructor and team meet in private to determine the project grade.

2.4.2.. Cognitive based process:

The dynamic training element with the self-learning frame, created on the basis of the Cybernetics model of self-learning, qualifies the same didactic requirements as other training elements. A training element should be reflect an independent portion and completed portion of the material and should have its own menu for the different techniques. This element should contain some fields in the dialogue window which would make it possible to keep up a dialogue with the student. The dialogue should be an option available to the student. The form in which the self-learning dialogue is conducted should imply that the student has the priority in decision-making. A learning element with a self-evaluation dynamic frame to evaluate progress in training is shown in Fig.4. To do this the self-learning frame is replaced by the self-evaluation dynamic frame. [4]

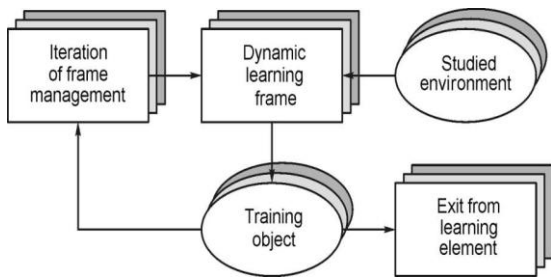


Fig. A self-directed cognitive process in the dynamic training.

3. PROPOSED WORK:

3.1. Graduate Attributes

The University of New South Wales has recognized a number of key areas that are of great benefit for graduate, whether they go on to the workplace or into further education or research. Graduates need skills that equip them for a lifetime of learning, skills that are above and beyond the particular disciplinary skill set that is developed over the degree program. Such skills include the ability to work in groups, to think critically, to communicate, to locate and utilize information, and to analyze and solve a variety of problems they will come across in the course of their profession. The educational policy adopted by the different universities is therefore to seeking to develop course programs that enables and students to not only develop knowledge and abilities related to their subject area.

3.2. Course Design

Having implemented a flexible content-delivery system for Signal Processing education, we sought to implement a form of project based learning in the rest of the course which creates an environment where students are challenged to take responsibility for their own learning. The following section explains the project based learning approach utilized in this course, along with the other aspects of the course designed to support this approach. [4]

3.3. Project-Based Learning in the Course Design

First all engineering courses are taught by a lectures. Problem sets were dealt with in rather large tutorial groups, and laboratory sessions have worked through a number of concepts with short,

practical rarely. The laboratory program became the primary drive of the course, centering on a single large problem that required students to master a variety of course-work elements in order to arrive at a solution. The assessment structure reflected this primacy of experimental work, with 60% of the final result deriving directly from lab work. The remaining marks came from in-class analytical examinations, coming half-way through and at the end of the session. Structuring the course this way allowed us to entirely remove the final exam, which served to place greater emphasis on the laboratory work as the principal element of learning. At the start of the semester, students were provided with all the lecture material relevant to the course syllabus. Detailed printed lecture notes were available in bound form, along with all pre-recorded lectures on DVD and recommendations of good reference text books. In this way, students were given a large amount of resources upfront, which they could draw upon whenever they needed. The challenge for the students was to appropriately use these data. [4]

3.4. Course Objectives

The course was designed such that students progressing through it should gain the ability to work through a number of design stages, including (but not limited to):

- determining whether a problem exists;
 - creating an exact statement of the problem;
 - identifying information needed to understand the problem;
 - identifying resources to be used to gather information;
 - generating possible solutions;
 - analyzing the solutions; and
 - presenting the solution, orally and/or in writing.
- These skills are invaluable to students, both in the remainder of their university career and in the professional workplace. [4]

4. DISTANCE LEARNING TECHNOLOGIES AND MAINTAINING PROCESS:

4.1. Model of educational system based on the Internet

The principal participants of distance learning process are students, teachers-tutors and managers of an educational process. Using the Internet-technologies students can be in any corner of the Earth and have access to information resources of the university via a global network. Also teachers are not obliged to work with students, being in the university building. Nowadays one may have an access to the Internet from one's home, a car, while on board a plane etc. The necessary condition for organization of the Internet-training is availability of a Web-server, a database and a management system of training at university .In order to organize the network training activity via the Internet three conditions should be met: creation of information-educational environment, organization of feedback between students and teachers and management of training process. Fig. shows the model of the network educational system in the form of a cube with network technologies, based on the Internet channels, incorporated into its foundation. The second layer of this cubic model presents information technologies implemented in the Internet. At last, the third layer of the cube and its top presents to the educational technologies incorporated in the trune educational system that includes electronic educational environment, means for information interaction and

means for management of training process. Internet channels and such tools of information technologies as hypertext, multimedia, Web servers ;transmission facilities in the form of e-mail, teleconferences, file transfers; software for PCs stand for basic elements of a distance educational system in the cubic model on fig.1. Basic elements of the educational system such as electronic teaching materials forming the educational environment; communication means used for contact and control of knowledge; management facilities of training process including database management system, automated workplace of the teacher, electronic dean's office are created on the basis of didactic properties and functions of initial elements. A forum, as well as an e-mail, makes it possible to organize public communication... Distance learning based on telecommunication and information technologies needs serious technical support. Availability of a local network and several servers in leads to the necessity to administrate of a network and servers. It means that it is necessary to exercise the complex of technical and organizational activities on support of viability of a network and servers and maintenance of their normal operation. Web pages containing a teaching material and information needed to organize a training process should be created and function on the Web-server [3]

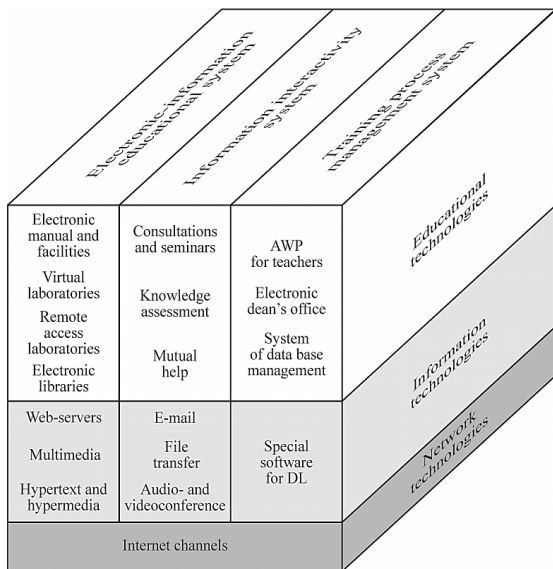


Fig. The model of the network educational system based on internet technologies. [1]

The keystone to success in the organization the Internet-training is a constant methodical support of training process, permanent training of teachers' and exchange of experience between teachers ,and different authorization. It checks the entered name and the password of a user and allows viewing the information. The block of authorization forms only that information which is needed for a particular user (administrator, student, teacher .It allows the administrator to adjust the level of access to information resources for each particular user. Access to the given block is provided only for the exclusive users having the rights of the administrator. To get an access to the closed parts of the Web-site the passwords are needed. They are assigned automatically by means of the *subsystem of users' passwords assignment*. Information about students has the name "Student". Using this system, the administrator can enter and edit all necessary information about students personal data (First, middle and last names, date of a birth, address, phone, E-mail), education background (the name of the educational institution one

graduated from), place of employment (name of an enterprise, address, contacts). [3]

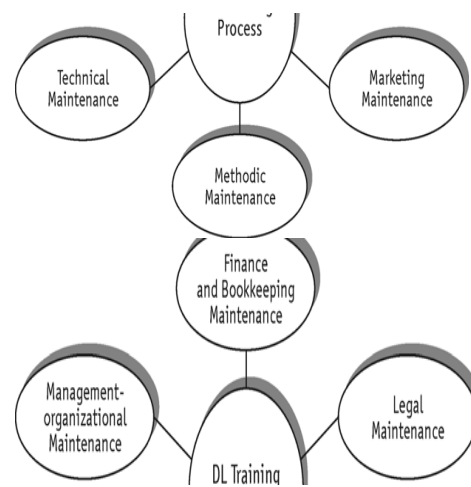


Fig. Organization of the Internet-training process. [1]

5. CONCLUSION

Experience gained through the study of the application of an a self-directed learning approach in a Web application design and development course indicates that working professional students get an very good approaches who are working or other work the can get an knowledge and have successful learning experiences and enjoy self-deterministic learning experiences. An investigation of the different techniques of implementation and learning has been done by the different way in above paper,

The students are mastering the course material. Survey results indicate a high degree of student satisfaction with both the self-determined approach and the course overall .Many areas of future exploration will help determine the impact of the approach on various student populations and aid in the customization of the approach to such populations. One area of future exploration is to study the impact of gender, age, background, and experience on student satisfaction with

Self-directed learning. Another area of research is the long-term impact of self-directed learning. Research into whether the self-directed learning experience causes a long-term change in student learning habits and in long-term student success in both academia and industry would be of interest.

6. REFERENCES

- [1] M. Knowles, *Self-Directed Learning: A Guide for Learners and Teachers*. New York: Association, 1975.
- [2] —, CA: *Jossey-Bass Andragogy in Action: Applying Modern Principles of Adult Learning*. San Francisco, 1984.
- [3] —, "Student-directed learning in a graduate software engineering Course," in *Proc. 34th ASEE/IEEE Frontiers in Educ. Conf.* Oct. 2004, pp. F2C9–F2C14.
- [4] the *International Journal of Self-Directed Learning* (ISSN 1934-01)
- [5] CO 138. *International Journal of Self-Directed Learning* College of Education, Florida Atlantic University.
- [6] *Core Servlets and Java server Pages*, 2nd ed. Upper Saddle River, NJ: Prentice-Hall, 2004.

- [7] —, "Student-directed learning in a graduate software engineering Course," in Proc. 34th ASEE/IEEE Frontiers in Educ. Conf., Oct. 2004, pp. F2C9–F2C14.
- [8] H. J. C. Ellis, "Autonomous learning in on-line and traditional versions of a software engineering course," in Proc. 18th Annu. Conf. Software Engineering Educ. Training, Apr. 2005, pp. 69–76
- [9] —, "Student-directed learning in a graduate software engineering course," in Proc. 34th ASEE/IEEE Frontiers in Educ. Conf., Oct. 2004, pp. F2C9–F2C14.
- [10] H. J. C. Ellis, "An evaluation of learning in an online project-based web application design and development course," *J. Compute. Sci. Colleges*, vol. 21, no. 6, pp. 217–227, Jun. 2006.
- [11] Criteria for Accrediting Engineering Programs, Effective for Evaluations During the 2005–2006 Accreditation Cycle. ABET. C001 05-06, Aug. 2006.