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**Submission date:** 16-Jul-2019 09:29AM (UTC+0700)

**Submission ID:** 1148823937

**File name:** asional\_-\_The\_Development\_of\_Learning\_Model\_Of\_Web....-11-15.pdf (332.86K)

**Word count:** 2799

**Character count:** 15584

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## THE DEVELOPMENT OF LEARNING MODEL OF WEB PROGRAMMING COURSE WITH PROJECT BASED LEARNING

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### Abstract

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The purpose of this research is to develop a *project based learning* model on web programming course (PBL-Web). Specifically this study aims to remedy find web programming model of *project based learning* (PBL-Web). In order to achieve the objectives and targets set, this study is development of web programming model of learning in the context of Project Based Learning will be done using the R and D development model developed by Borg & Gall. R & D approach is to verify and assess various models of learning in teaching and learning in education institutions, including web programming model of *project based learning* (PBL-site) which will be developed in this research. Project-based learning is learning by implementing a project to improve the creativity of learners to produce a real work/real end product. Project-based learning in a course web programming is a constructive elearning approach to deepening project-based learning approach to real and relevant issues in the field web programming. Relevance learning web programming with Web programming model of the project is in need of real life examples in the form of web products, requiring programming skills, requiring the ability to think logically and problem-solving abilities. Project-based learning is very well developed web programming for field studies because (1) the final product web; (2) learners acquire useful knowledge to solve problems independently; (3) can learn actively and independently; (4) capable of critical thinking, and develop initiatives.

**Key Words:** *Web Programming, Learning, Project Based*

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### Introduction

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Efforts to improve the quality of education is a continuous process undertaken and sustained. Improving the quality of learning meant that the national education goals can be achieved with either. Various attempts were made by the government to improve the quality of national education. These include efforts through the development and refinement of curriculum, evaluation system improvements, infrastructure improvements and the development of educational materials and learning model.

Learning web programming course is one of the things that deserve attention, especially the development of learning models. The importance of learning development courses web programming because this area is one area that has a very large role in the development of Information Technology (IT).

Information Technology is a field that is currently used in various sectors of life. IT is an absolute skill for without mastery of IT people of Indonesia will be excluded from global competition. The web programming course one area that has a very large role in the development of IT. It is undeniable that the development of IT in today's world, it is supported by the large role that the Internet sector where websites including the most popular Internet applications nowadays. Therefore learning web programming is an important thing to be studied.

The Web programming model of learning should be through a real example. A concrete example is in learning web programming this is a product. One model of learning that emphasizes a product is a *project based learning*. Project based learning (PBL) focuses on the role of students in the learning process as well as a product at the end of the lesson.

Studies on the development of project-based learning in a course on web programming course Information Engineering and Computer Education is very important to be done in order to improve student achievement and competence, applying oriented learning in the real world of work so as to improve the quality of learning in the field of technology and informatics.

### Concepts and Learning Approach

Education is a human effort to produce the cultural continuity of the life of every generation. Every pluralistic nation always prepare citizens become educated citizens for the benefit continuity of generations. Human beings are creatures who deals with the education of socalled *animal* and *animal educandumaducandus* the man as being educated as well as being educational. [10]

Education is a conscious and deliberate effort to create an atmosphere of learning and the learning process so that learners are actively developing the potential for him to gain spiritual strength of religious, self-control, personality, intelligence, noble character and skills required. Therefore, education can be interpreted as an attempt to change the behavior of students in order to become a man who can live independently in the community as members of the surrounding natural environment [1].

Education is not only about the environment only intellectual but also personality development of the students as a whole. Therefore, a theory of education isneeded in order to build the world of education. That education is the key assumptions : (1) education stems from the actual condition of individual learning and the learning environment; (2) normative education means education is focused on the things that are good; (3) education is a process of achieving goals and a series of activities that begins with the actual condition of the individual who learns to achieve the expected goals [1].

Therefore, please note the link between education and learning. Teaching is essentially a process which is the process of arranging , organizing neighborhood, which raised the interest of the students to learn.

Teaching can also be interpreted as an effort to help someone to learn something. Based on the above it can be concluded that the essence of education is an effort that is done in a planned and systematic way to change the behavior of human learners be able to live independently in the community and the surrounding environment by providing the knowledge, experience, understanding thoroughly.

### Characteristics of project-based learning

In contrast to traditional learning models are generally characterized by short duration classroom practice, isolated, and lecturer-centered learning activities, project-based learning model or PBL more emphasis on learning a relatively long duration, holistic interdisciplinary, student centered, and practices and integrated with real world issues . In project-based learning (PBL), students learn in the real problem, which can deliver permanent knowledge. PBL is a model that can organize projects in learning [11].

PBL is a tool that can provide power to the students understand precisely what they are learning. To succeed in PBL, collaborative process in group work is emphasized [9]. Will provide a collaborative learning environment in which students work together with both the teacher and the student members of other groups to achieve certain goals as a project goal [12].

Project-based learning (PBL) can be prepared in collaboration with the instructor, while student learning in collaborative groups between 4-5 people. When students work in teams, they find the skills to plan, organize, negotiate , and make an agreement on the issues that task will be done, who is responsible for each task , and how the information will be collected and presented [5]. The skills that have been identified by these students is a skill that is very important for the success of his life , and as labor is a very important skill in the workplace. Due to the nature of work is a collaborative project, the ongoing development of these skills among learners.

Characteristics of PBL include topics, tasks, roles played by students, the context in which the project work done. Project Based Learning involves real-life challenges



[4]. PBL can change the nature of the relationship between professor and student teachers. Project may reduce competition in the classroom and directing students more collaborative than working individually.

Project Based Learning has some advantages [5]. These advantages include (1) increase motivation. (2) improve the ability of solving the problem, (3) increase collaborative skills(4) improve the skills of managing resources. Learning Project implemented either give to students learning and practice in organizing the project, and make the allocation of time and other resources such as equipment to complete the task.

Advantage of Project Based Learning are as follows: (1) Increase motivation. Several reports on the project said many students exceeded the time limit due to preoccupation discuss projects they are working on , trying hard to achieve the project. (2) Improve the ability of solving the problem . Research on the development of high-level cognitive skills of students stressed the need for students to engage in problem-solving tasks and the need for specialized learning on how to find and solve the problem. (3) Increase collaborative skills. The importance of group work in a project requiring students and practicing it expands working group cooperative communication skills, evaluation of students, exchange of information online is a collaborative aspects of a project. (4) Improve resource management skills. Learning Project is implemented either give to students learning and practice in organizing the project, and make the allocation of time and other resources such as equipment to complete the task [7].

Thus far different project -based learning with hands-on learning with traditional background. Direct learning is one of the variations of alternative learning methods that are dominated by teachers. Direct instruction is designed to develop the knowledge centered teaching. Therefore, project-based learning (PBL) is different from traditional learning.

## Discussion Characteristics of Web Programming Course

Courses web programming is a subject that studies about how to make a web. To find out how to make a web, a student must know the web programming languages and software support in making a web. The initial step is to know web programming languages involved in web programming such as HTML, XML, XHTML, CSS, Javascript, Ajax, PHP, JQuery, and others. In Web Programming course, students are given materials about creating dynamic websites.

The materials of web programming will include installation and configuration of the web application server and data base server, Server Side Scripting using PHP, MySQL database access, AJAX technology, and includes a website that has been made during the lecture to web hosting. By following this course, students are expected to provide solutions to the needs of a dynamic website.

There are several components that are studied in a web programming course [3]:

### 1). HTML (*Hypertext Markup Language*)

HTML is a markup language that web structures. Students can learn HTML using notepad and a browser. Students type in HTML code in notepad, then save it in html format and a file that is opened will be displayed in the browser.

### 2). CSS (*Cascading Style Sheet*)

CSS is a web component that makes an interesting web interface. The analogy to HTML as the bones (functioning as a structure) of the human body, and CSS (Cascading Style Sheet) described as human flesh [Duken]. CSS (Cascading Style Sheets) which gave the presentation and appearance of the people who saw from the web that are made.

### 3). Dynamic Programming

There are several dynamic programming can be done on the internet, The programming languages are PHP, ASP, Python, and many others. The most widely used is PHP. PHP also has a lot of documentation, so that if a student difficulty in making programs, can see that many sources on the internet. Programming

languages such as C/C++, Visual Basic, C#, actually can be used.

#### 4). Data Storage

Data storage is a place that is used to store data on the web is made, either the user data, passwords, credit card data, shopping list, the data value of college, and others. There are many applications of data storage, such as MySQL, PostgreSQL, Oracle, etc. MySQL is the DBMS that is often used. But many other DBMS applications, DBM typically uses one language to access, SQL. SQL (structured query language) is a language that is used for data management in a DBMS.

Web programming is one of the principal subjects of the study program PTK in Indonesia. The purpose of this course is web programming: (1) provide insight and knowledge to the students in developing web applications in depth, critical and systematic; (2) provide knowledge about the characteristics and the basic principles of a website.

Then implementation of this course, the student is expected to: (1) have an understanding of various programming techniques and programming languages are available and can choose the appropriate design for a web application; (2) able to demonstrate the ability to design and implement a web maintenance; (3) be able to use the language of web designing HTML and JavaScript and other programming languages; (4) to design and implement a web application server by using one or more appropriate technology; (5) have the knowledge to analyze and critically evaluate Web applications; (6) have an understanding of web protocols is a critical and systematic [8].

#### Relevance PBL with web programming course

When linked with the project-based learning model for web programming courses are very relevant to the PBL models described in the previous section. This can be described in the following table with the relevance of PBL web programming courses.

Table 1: Relevance Project Based Learning with Web Programming Course

<i>Interconnection</i>		
<i>Web Programming Course</i>	Creating a complex script and links	Problem solving Complex
	Requires strong logical thinking	
	Making the web for various fields	Interdisipliner
	Produce web design	The Real Product
		Authentic tasks Emphasis on time management
Program design requires creativity	The role of the lecturer as a resource provider	

*Projek Based learning*

Teaching a web programming course has the potential to make a project-based learning experience more interesting for students. Students who driven web programming course more active on their own initiative to make the web design, teacher or instructor position behind evaluating web projects created by the students.

Some issues related to project-based learning are (1) the students acquire basic knowledge useful for solving the problems encountered in the field; (2) to learn actively and independently; (3) capable of critical thinking, and develop initiatives. Therefore, the application of this model of learning in the field of computers and informatics learning can provide opportunities to improve the quality of learning in the field.

Web projects created by students can be either web planning process, the determination of the programming language, programming algorithm solving. But in order for a web project created to meet the learning criterion then a web

project should create a new understanding of the basics of web programming and web-making skills for students. Approach in a production model that is implemented in web creation web programming course by producing a real project that is a web. By using the Sharan models [7] then there are several stages in the project-based learning web programming. These stages is to determine the topic of the web, web planning, collecting data and syntax, making web design and discuss the results achieved with other colleagues.

### Conclusion

Studies on PBL showed an increase in programming: motivation of learners, problem-solving skills, communication skills and teamwork, knowledge, and capacity to learn independence. Implementation of project-based learning involves the development of the divide of understanding identifying user needs, articulating and classifying core competency are as of programming, and designing web programming experience project-based learning through an interactive process in bringing together the core competencies and map the experience based on the user's needs.

The results of the study of web-based learning project showed learning web programming with Web programming model of the project is in need of real life examples in the form of web products, requiring programming skills, requiring the ability to think logically and problem-solving abilities. Project-based learning is very well developed web programming for field studies because (1) the final product web; (2) learners acquire useful knowledge to solve problems independently; (3) can learn actively and independently; (4) capable of critical thinking, and develop initiatives.

### ACKNOWLEDGMENT

My thank share extended to Mr. Herman Dwi Surjono, Ph.D, Mr. Dr. Rais for the guidance so that this paper can be made, the Steering Committee and Organizing Committee of ICVET 2014 has been made to

create a discussion forum on vocational education. Friends and colleagues at UNM and UNY who have helped, opened my mind, so I can make writing about PBL and Web Programming. I urge my colleague story using the PBL method in teaching a variety of science fields we using respectively while continuing to correct the PBL models and hopefully the better models in the future.

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