# DEVELOPMENT OF WEB-BASED INSTRUCTIONAL MODEL

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**Abstract**

Development of web-based instructional model is expected to encourage the involvement of students actively and constructively to the media, so the learning process a fun, creative, and not boring. Development of a model of instructional social networking website that can be used by an individual or several people at once (networking /collaboration). An interactive learning materials were developed, so that students can be motivated in learning. Teacher acted as a facilitator in this case to motivate students verbally and non verbally (using webmedia). The work of students in the form of training, evaluation, or questions and responses will be stored in the program are made, and it will facilitate teachers to recapitulate (correcting) the work of these students. Design development of the model is divided into three parts, namely:1) a conceptual model as a manifestation of the theory and principles related to web-based learning, 2) a model as a form of procedural stages of the formation of a web-based learning sites, 3) physical models to obtain evidence derived from empirical data on the results obtained from the development of web-based learning model.

*Keywords*: development, learning models, instructional, web

## 1. INTRODUCTION

Educational technology is a field study about the application of complex and integrated processes in analyzing and solving the problems of learning.[1] This means, in any solution of the problem involving people, procedures, ideas, tools, and organization. One of these learning resources can be identified as a medium of learning that is suitable or effective for helping learning purposes.

Development of information and communication technologies (ICT) in recent years is growing rapidly. It is changing the paradigm of the public in finding information that is not just limited to newspapers, radio, and television, but also from the source virtual world. One of the most significant impact in the development of the ICT in education, where ICT acts as a medium of communication and information from teachers to students that contains information on education, but it also means the media is presenting the idea of teachers in delivering educational materials.

Efforts are being made by the developers of education in order to improve student achievement. In the study, students were more interested in an interactive media delivered to them. Presentation graphics or examples are given about the animation will create increased interest in student learning. A designer's task of learning a very important role to provide a medium of learning, such as games, so that students will continue to do everything possible to resolve these games. One effort that is used is to use computer media, to create interactive learning.

Development of web-based learning model (web) encourage the involvement of students actively and constructively in the process of their learning to the media, so the learning process will be fun, creative, and not boring. In addition, the model was designed in the form of learning social networking website that can be used by an individual or several people at once (networking / collaboration).

Before developing web-based learning model, a preliminary study should be performed to obtain input on the web-based learning model that fits the needs of teachers and students.Preliminary studies carried out by performing the activities of sharing between peers / teachers and students about web-base instructional, analyzing existing web-base instructional, and what materials will be developed. The focus of the article is to explain the concept and design in the development of web-based instructional models.

## 2. CONCEPT DEVELOPMENT MODEL

The model is something that describes a pattern of thinking. A model usually describes the overall of inter-related concept. In other words, the model can also be seen as an attempt to concretize and at the same time a

[1] Yusufhadi Miarso, *Menyemai Benih Teknologi Pendidikan* (Jakarta: Kencana Prenada Media Group, 2007), h. 6

theory is an analogy and representation of variables contained in the theory. [2] According to Robins, "A model is an abstraction of reality; a simplified representation of some real-world phenomenon." [3] The purpose of this definition, the model is a representation of some phenomena that exist in the real world. Definition of the model was expressed by Miarso, the model is a representation of a process in graphic form and / or narrative, showing the main elements and structure. In this case it is possible to interprete the narrative model into a graphical form, or vice versa. [4] So from these definitions it concluded that the model is a process of thinking and the components contained in it, which is represented in graphic form and / or narrative.

There are several models include: 1) conceptual model, 2) procedural models, and 3) physical models. The conceptual model is a conceptualization of the theories or in other words the realization of a theory. Procedural models has a prescriptive nature of how is something. Model procedural in essence a manifestation of the stages of the formation of a model. While the physical model of a model in physical form (the product). [5]

In the design of learning systems, models usually describe the steps or procedures to be implemented to create learning activities that are effective, efficient, and attractive.[6] Thus a model in the development of learning is a process that is systematic in the design, construction, utilization, management, and evaluation of learning systems.

Based on an understanding of the development of learning, it would require at least five criteria must be met in the learning model, namely: 1) have goals, 2) compatibility with the objectives, 3) systematic, 4) have evaluation activities, and 5) fun. Therefore, the learning system can be compared to the production process consisting of the input-process-output, which is integrated with each other.

### 2.1 Principles and Framework for Web-Based Instructional Model

In developing web-based instructional models need to consider the needs of learning, namely:

a. Student centered learning, the learning process that place students as study subjects. It focus the attention to their talents, interests, abilities, and how learning strategies, motivation, and social background of students. Learning process should encourage students to develop their talents and potential;
b. Learning by doing, learning needs to provide real experience in everyday life and in work related to the application of concepts, rules and principles of the disciplines studied;
c. Life-long learning, learning to equip students with study skills include confidence, curiosity, ability to understand others, ability to communicate and collaborate in order to encourage him to keep learning, both formally and informally in schools and outside class;
d. Collaborative learning, learning process that encourage students to communicate ideas and findings to the creation of other students, teachers / lecturers or others. Thus learning allows students to socialize with a respect for differences (of opinion, attitude, ability, achievement) and training for work;
e. Problem based learning, learning process should be selected and designed so as to encourage and train students to be able to identify problems and solve them using cognitive ability. The learning process also should stimulate students to actively seek answers to the problem by using scientific procedures;
f. Creative learning, learning process needs to be selected and designed to provide opportunities and creative freedom on an ongoing basis;
a. Self-motivation learning, learning to provide opportunities for students to develop a healthy spirit of competition to obtain the incentives, cooperation, and solidarity. Learning needs to provide tasks that allow students to work independently.[7]

Based on the learning needs, the principles used as references to develop the web-based learning model, refers to the views Miarso, namely: a) independent principle, embodied in the presence of web-based instructional model that can be learned by students independently, learn individually or groups, and can also assisted by the teacher; b) the principle of flexibility, allow the teacher to initiate, manage schedules and activities of learning, access learning resources, and to end the learning process according to the will of the students; c) currentness

[2]Benny A. Pribadi, *Model Desain Sistem Pembelajaran* (Jakarta: Dian Rakyat, 2010), h. 86
[3]Stephen P. Robins, *Organizational Behavior: Concepts, Controversies, Applications* (New York: Prentice Hall, Inc., 1996), h. 25
[4]Yusufhadi Miarso, *"Survei Model Pengembangan Pembelajaran",* makalah yang disampaikan sebagai bahan ajar kuliah mahasiswa S3 Program Studi Teknologi Pendidikan Pascasarjana UNJ, Jakarta, 2011
[5]Yusufhadi Miarso, *Kebenaran Intersubjektivitas, "makalah"* yang disampaikan sebagai bahan ajar kuliah mahasiswa S3 Program Studi Teknologi Pendidikan Pascasarjana UNJ, 2003.
[6]Pribadi, *op.cit*, h. 86
[7]Anonim. *Kajian Model Konseptual Sistem ePembelajaran* (http://luk.staff.ugm.ac.id/atur/rbi/ SistemE-Belajar.pdf, diakses 19 Januari 2012), hh. 1-2

principle, embodied in the presence of learning materials on time or whenever necessary; d) the principle of conformity, realized by a program of study directly related to personal needs and market demands; e) the principle of mobility, is realized with the availability of web-based learning model that can be accessed anywhere and anytime, that wherever required can be used; f) the principles of efficiency, utilization of the premises embodied a variety of sources available to learn optimally.[8]

There are three main components that must be considered in the development of learning models, namely: a) the conditions of learning; b) teaching methods, and c) learning outcomes. Learning conditions include characteristics of the learning objectives / constraints and characteristics of student learning. Teaching methods include how the organization of learning materials, delivery strategies and management activities. While the study results include the effectiveness, efficiency and appeal for students. [9]

Development of learning at least consists of five main activities, namely: a) analyze conditions and needs of student learning; b) a series of specifications to design an effective, efficient, and relevant to students' environment; c) develop all materials for all students and materials management; d) implementation of coexistence draft learning outcomes; e) evaluation of the results of formative and summative development. [10]

### 2.2 Web-Based instructional Principle

The ideas raised by several experts on teaching and learning is fundamental in the design of the development of web-based instructional model. The principles of web-based instructional are as follows:

a. Self-learning. Self-learning system is an organized learning program setting so that individual learners / students can select or specify the materials and their own learning progress.[11]
b. Mastery learning. Mastery learning is a philosophy of learning based on the assumption that all students can learn if given sufficient time and adequate learning opportunities.[12]
c. Active learning. Basic ideas of active learning approach, in principle, follow the core idea of constructivism learning theory. Developments in new paradigm applied child birth which is an active learning paradigm.[13] Active learning is an approach of learning that involves students as "his own teacher".
d. Networked Learning. Networked Learning presents the flexibilityof space and time. Interactions that occur in a networked learningcould mean the interaction between students and teachers, the interaction between students and the media, participation of students in a discussion session, or collaboration among the students themselves.

### 2.3 The concept of Web-Based Instructional Model

Development of information technology very fast nowadays, especially the development of internet technology, have promoted the development of the concept of web-based learning model. Characteristics of Internet technology can always be accessed anytime, anywhere, multiuser, and offers all conveniences, have made the Internet a perfect medium for the development of web-based instructional model. Web-based instructional model is a learning activity that utilize media site (website) which can be accessed through the Internet. Web-based instructional model (web based learning) is one type of application of electronic learning (e-learning).

E-learning is a term that refers to the learning that takes place through electronic media (computer) connected to the network. E-learning content using the media in the form of text, images, animations, video, and others. E-learning can also be applied face to face learning, for example, using video, audio, CD-ROM, and others. So e-learning is a process and implementation of web-based learning activities (web-based learning), computer-based learning (computer based learning), virtual classroom (virtual classroom). These materials in e-learning activities are mostly delivered via internet, intranet, video or audio tape, interactive television, satellite, and CD-ROM.

Web-based instructional model is one form of e-learning, where the material (content) and how to deliver the learning (delivery method) using the internet (web). Therefore, web-based learning model is a learning experience by utilizing the Internet to communicate and convey information learning. In general, there are three possibilities in the development of web-based learning model, namely:

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[8] Yusufhadi Miarso, *Menyemai Benih Teknologi Pendidikan, op.cit.,* h. 251
[9] Charles M. Reigeluth (Ed), *Instructional Design, Theory and Models: An Overview of Their Current Status* (New Jersey: Lawrence Erlbaum Associates Publishers, 1983), h. 19
[10] Kent L. Gustafon dan Robert Maribe Branch, *Survey of Instructional Development Models* (New York: Eric Clearinghause in Information & Technology Syracuse University, 2002), hh. xii-xiii
[11] Miarso, *Menyemai Benih Teknologi Pendidikan, loc.cit*
[12] Wikipedia, *Belajar Tuntas* (http://id.wikipedia.org/wiki/Belajar_tuntas diakses 19 Januari 2012).
[13] Pusat Kurikulum Badan Penelitian dan Pengembangan, *Panduan Pengembangan Pendekatan Belajar Aktif* (Jakarta:Kementerian Pendidikan Nasional, 2010), h. 21

a. Development of web-based learning model where students and teachers are completely separated, and no need for face to face learning process.The whole teaching materials, discussion, consultation, assignments, exercises, exams, and other learning activities delivered entirely over the Internet. In other words, this model uses the remote system;
b. Development of web-based instructional model that combines distance learning and face to face (conventional). Most of the material delivered via the internet, and some face to face, which serves to complement each other. In this model, teachers can provide instruction for students to learn the course material via the web that has been made. Students are also given direction to look for other sources of relevant websites. In face to face, students and teachers discussed more about the findings of material that has been learned through the internet;
c. Development of web-based learning model that only use the Internet to support the promotion of quality learning done in class.Internet function is to provide enrichment and communication between students and teachers, fellow students, members of the group, or students with other resource persons. Therefore, the role of teachers in this case are required to master the technique of searching for information on the internet, guide students seek and find sites relevant to learning materials, presents the material through the web of interest and the interest, guidance and communication service via the internet, and other skills necessary.

Web-based learning model that was developed at least the following elements: a) the center of student activities; b) the instructional material; c) the interaction in the group; d) administrative systems to individual needs; e) the public information; f) of training and evaluation; g) the online material outside the subject matter.

## 3. WEB-BASED DESIGN MODEL DEVELOPMENT

Development of web-based instructional model consists of three models, namely: 1) a conceptual model which is a manifestation of the theory and principles related to web-based learning, 2) a model which is a form of procedural stages of the formation of a web-based instructional sites, 3) physical models to obtain evidence derived from empirical data on the results obtained from the development of web-based instructional model.

### 3.1 Conceptual Model

The conceptual model designed with the features of functional processes that can be utilized by the user to run the web-based learning model, which was adapted from the model 3P (People, Process, Product). The user is the person or people who use web-based learning models, process models associated with the ability to run web-based instructional in certain functions, while the products are different forms of service which can be utilized by the user through a process that is run by a web-based instructional model. [14]

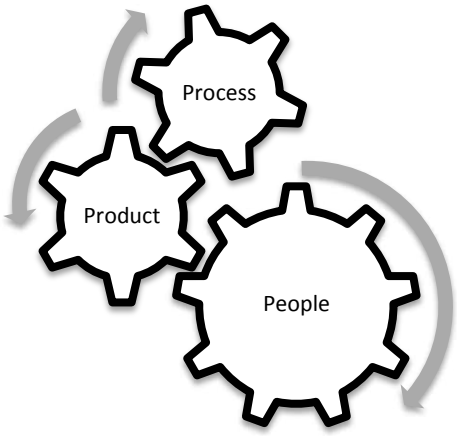


*Figure 1. Model 3P*

Each aspect of the 3P model has several components in a web-based instructional model. Users in web-based instructional models include students, teachers, administrators, and the public. It means that the system must be supported by user-management features to manage some kind of role with the respective authorities.

Teachers as users, can also double as an administrator.Administrator serves as maintenance of web-based model development. Teachers have an important role in management of the material, learning, content, sequels and navigation, training and evaluation, assessment, delivery, and users. Students as users are given the

[14] Anonim, *op.cit.* h. 5

freedom to learn individually or in groups, by first selecting the option to log in to one person or two people or three people. General users who are not enrolled in web-based learning model, can only be enjoyed in providing public services, such as articles, learning materials, and links to sites of learning.

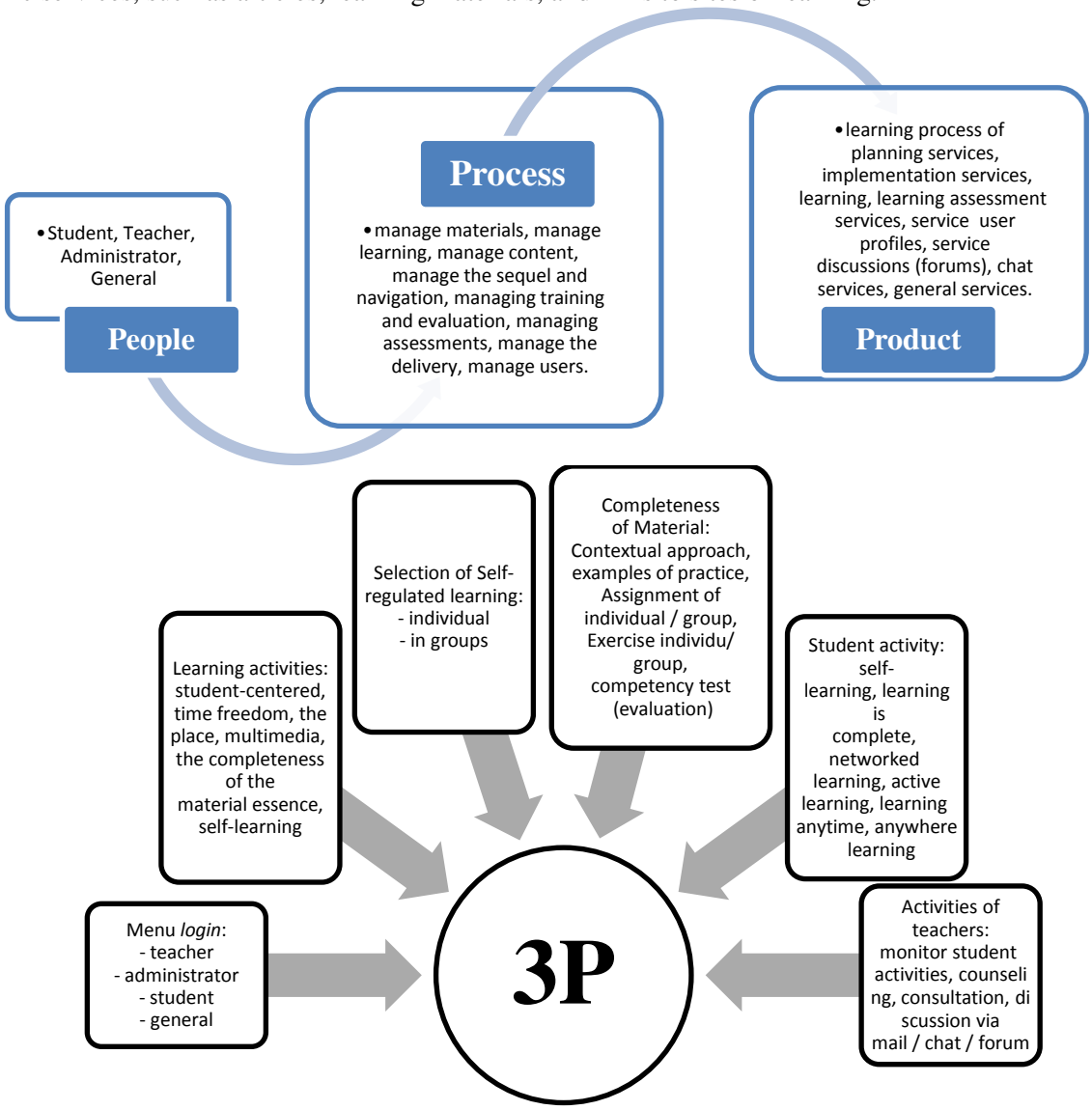


*Figure 2 Conceptual Model Component*

Aspects of the process are the abilities that should be available inweb-based learning model in order to conduct a quality learning process. If one component is not available then the model can certainly not conduct a quality learning. Aspects of the process between each user will be different, such as student management process will vary with the management of teachers, administratorsand general users.

Aspects of the product is some form of service resulting in a web-based learning model that provides all the components in the aspects of the process. The resulting form of service learning in the form of service planning, service implementation of learning, learning assessment services, service user profiles, service discussions (forums), chat services, and public service.

In the model represents the 3P, web-based learning model to be built with an architecture that can be understood, the user can use a variety of products, services, web-based instructional model on condition that the web-based instructional model is capable of running all the components of the functional process model. When one component of the process can not run the service provided to users could not be optimized.

### 3.2 Procedural Mode

Procedural modeling using the model of Dick & Carey. [15] Development of the model is divided into three series of activities namely: the stage of identifying, developing stage, the stage of evaluation and revision.

[15] Walter Dick, Lou Carey dan James O Carey, *The Systematic Design of Instruction* (Boston: Pearson, 2005), h. 1

### 3.2.1 Identification phase

The first step in planning a web-based instructional model is a preliminary study to identify existing problems, so it can determine what steps should be taken. In preliminary studies carried out analysis of the results of sharing with peers / teachers and students, analyzing web-based instructional model that existed, and analyze the material. The results of this preliminary study as a basis for identification of thr design development stage of web-based instructional model.

The next step to identify learning needs and write the general learning objectives, learning analysis, and identify and analyze the characteristics of students' behavior is adapted to the learning outcomes. This information will greatly assist designers in designing learning. It is important in analyzing the characteristics of students, such as the general characteristics of the students, the basic competencies that students should possess (knowledge, skills and attitudes), and learning styles of students.

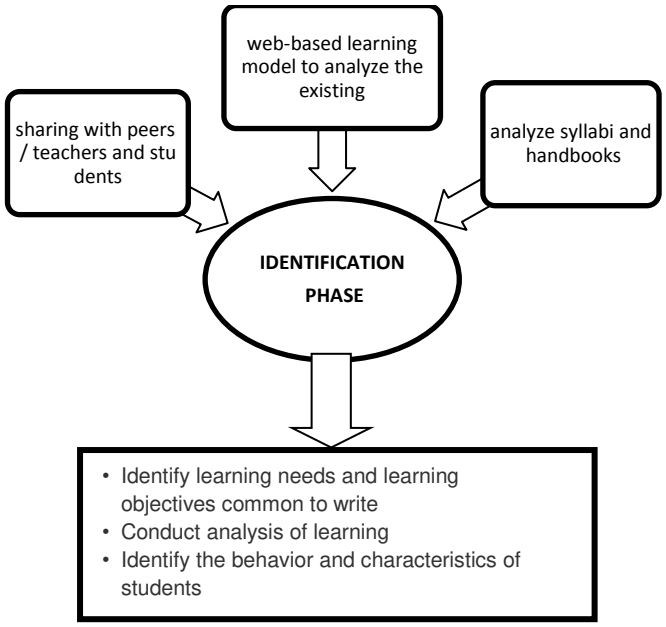


*Figure 3 Identifying phase*

### 3.2.2 Development Phase

After doing the steps identified, followed by determining the specific learning objectives, define the reference standard test, and then choose the methods, media and strategies to be used. This allows the interaction between students and students, students with the media, and students with a teacher.

Designers to design the next phase of learning materials to be used in the form of an interactive web media. Interactive learning materials designed so that students can be motivated in learning. In the process of designing involves the process of designing purposes, flowcharts, storyboards, user interface design, and system integration. Flowchart is a graphical depiction of the steps and procedures of a program sequence. [16] Storyboard rather like comics that we read every day. On each page shows the development of the story or information. Storyboard is a summary adaptation functions and tools to be used in making web-based learning model.

Next in user interface design, the teacher in this case as fasilitator, who motivates students verbally and non verbally (using web media). The work of students in the form of training, evaluation, or questions and responses will be stored in the program are made, so that facilitate teachers to recapitulate (correcting) the work of these students. Web designed also to be able to use a computer for two or three students. Learning strategy is also designed to use cooperative learning methods, so that students feel motivated by the presence of teachers in the virtual classroom.

Involvement of students actively indicates whether the media is effective or not. Designed to make learning activities that allow students to apply knowledge or new skills and receive feedback on the suitability of their efforts before and after learning. Training is provided independently in each material is independent evaluation may provide feedback. This feedback is automatically recorded in the program, so that teachers can evaluate students' abilities.

[16] Tay Vaughan, *Multimedia: Making It Work* (New York: Mc Graw Hill, 2011), h. 183

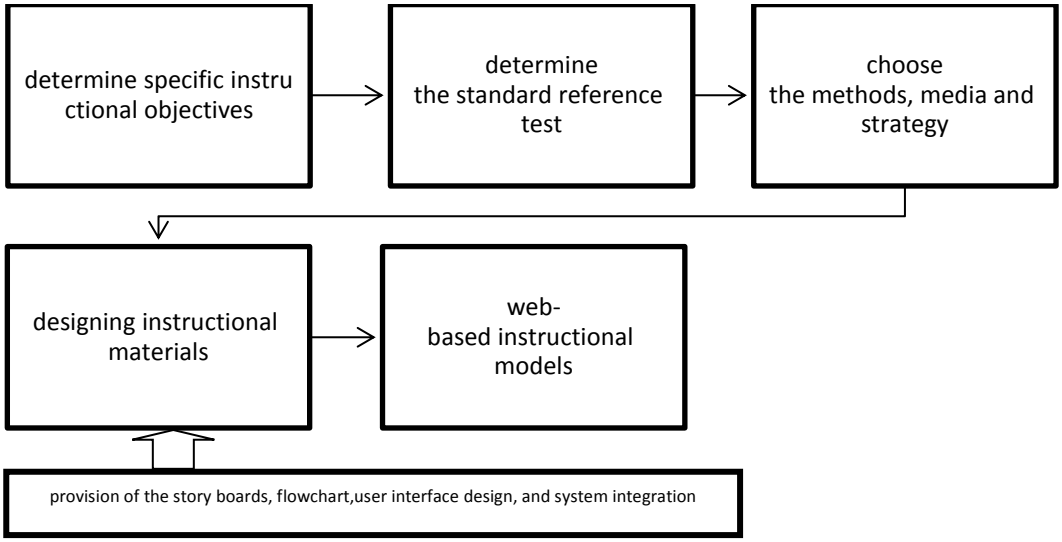


*Figure 4 Development Phase*

### 3.2.3 Evaluation and Revision Phase

Once the web is finished, the formative evaluation conducted by first carrying out an expert evaluation of media experts, content experts, design experts and linguists. Once the revised evaluation followed by "one to one" to see the legibility of the web media. This evaluation was carried out to students who have low capacity, medium and high. The next evaluation of small groups of eight to twelve students. After that the web can be field tested to find out the effectiveness and efficiency in the web-based instructional model. Evaluation and revision is carried out continuously until the web is effectively and efficiently assessed.

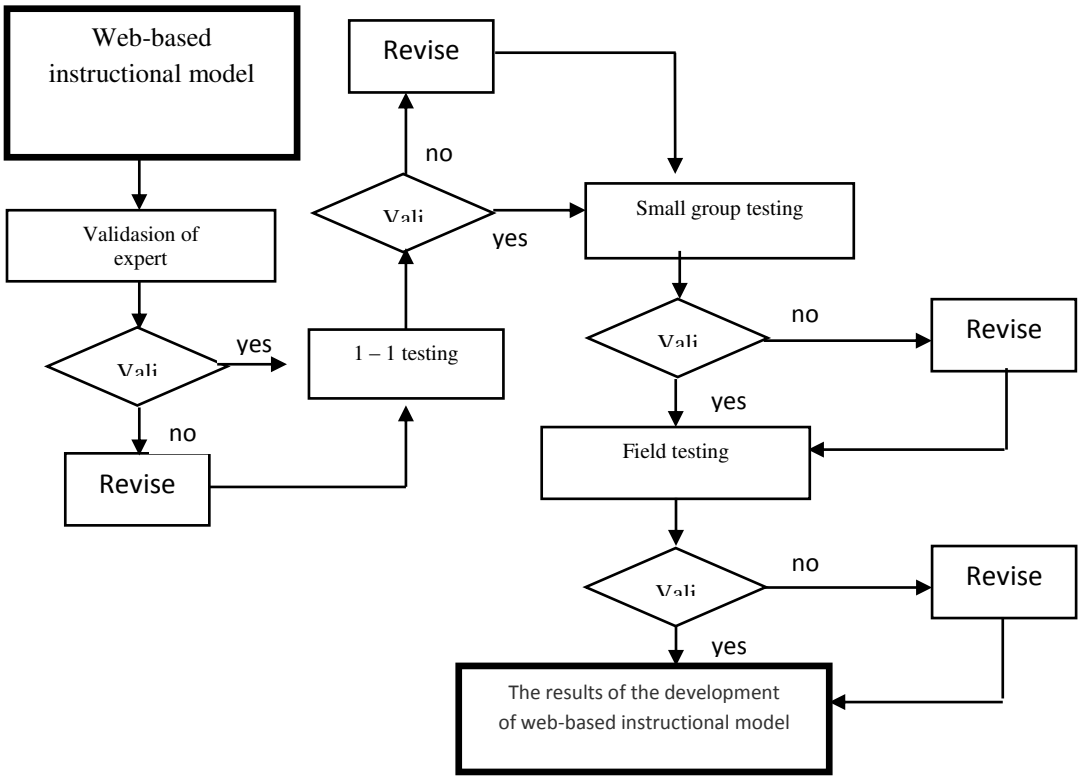


*Figure 5 Evaluation and Revision Phase*

### 3.3 Physical Model

After the completion of web-based instructional model evaluation, the model is called physical models. On a physical model of the implementation phase model. Implementation of web-based instructional model will be carried out after the model is being declared effective and efficient.

## 4. CONCLUSION

Web-based instructional model is one model of learning that can be implemented by combining the advantages of direct interaction and the use of internet technology. Web-based learning model can work well if the interaction and collaboration among the parties involved(ie teachers and students) is controlled and dynamic. In practical terms, a web-based instructional model offers a variety of techniques and tools of the material that can be used to allow interaction and collaboration during the learning process takes place. To maintain quality and control over the learning process conducted, the teacher must be able to choose the methods and the proper visualization tools in order to maintain students' motivation to contribute and interact with the material presented by the teacher. Teachers in this case as fasilitator, which motivates students verbally and non verbally (using media website). The work of students in the form of training, evaluation, or questions and responses will be stored in the program are made, to facilitate teachers to recapitulate (correcting) the work of these students. Implementation of web-based instructional model offers very promising opportunities for the development of a new learning model that is more exciting, interactive, dynamic, hi-tech, and controlled.

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