

# Development Of Interactive Digital Learning Materials On Nutrition Science Course in Adi Buana University Surabaya

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**Abstrac.** The purpose of the development of digital-based materials is finding a model strengthening ability of creativity lecturer productive field of culinary and tourism. The first step to achieve that goal is to do a preliminary research in the form of preparation of elements of technology (technoware, humanware, inforware, orgaware). Specifically target to be achieved is to produce learning materials-based e-learning. These products are included in the category inforware is specifically designed to strengthen the ability of the emulation. Component materials is organized to facilitate students accessing material on line learning material that can provide ease of learning to achieve learning objectives. The methods used for the development of learning materials is the creation and development of digital learning materials-based e-learning by stages: (1) the concept of pre-learning materials development, (2) development, (3) assessment. Product-based digital learning materials web e-learning was developed using the open source Moodle. Textbook developed examined the effectiveness and impact of digital learning materials-based e-learning towards the learning results acquisition courses nutrition, student Home economic program Adibuana University. Research Results. development of improved student achievement speed the creation of a menu based on the calculation of the nutritional value will be practice.

## 1 Introduction

Factors that affect the development of the learners are educators and infrastructure and also the medium of instruction. The media is an intermediary that helps clarify the learning material [1]. This media does not replace the position of teachers in the classroom but rather as a tool that facilitates teachers in learning. Also, the media also has a purpose, and that makes it easy to achieve the learning objectives [2].

Learning is an attempt to facilitate the learning process by manipulating the occurrence of learning resources so created a situation that is comfortable and conducive to achieving the objectives of learning [3]–[5]. Learning in the field of technology when viewed from its purpose more leads to the development of the emulation capabilities than the ability imitation [6].

Prospective teachers fertile field of culinary and tourism is a student Education Home Economic, who was programme courses nutrition. The student is expected to master the theoretical concept of the field of food in general and the conceptual idea of a special section in the area of knowledge in depth, as well as being able to formulate problem resolution by the demands of KKNi [7]. The preparation of professional candidates ability to suit the needs of KKNi is inseparable from fostering the knowledge to learn the science of nutrition. The

orientation of this learning is the development of optimally a winning learners potentials and competitive especially in entrepreneurship capabilities [8].

Design capable of the process and put together the steps of making functional products that have value economically through the utilization of technology and resources efficient [9]. Haven't been able to identify and design the production operations based on the scientific method to production needs and describes performance targets, methods of measurement, and measure performance. Haven't been able to carry out research to give a valid conclusion against complex problems in engineering products catering to business. Students make the product unavailable at a particular age group nutritional needs. Learning is a process or a way to make people or living beings learn [10] — the classification of media which are computers. Computer-based learning media is the media of learning is most often used in the teaching and learning process at this time. The processor is programmed to support independent education, learners, which combines audio and visual capabilities [10]. Also, the network helps motor skills learners learning including the following packaged in the form of a website, which provides a way of learning material, video, animations (simulation) and forums.

According to [11] website can be defined as groups of pages that are used to publish information in the form of text, images and other multimedia program in the way of animation, sound and or a combination of all these things, neither of which are static or dynamic forms a series of interrelated building between page one with another page which is often referred to as hyperlinks. Web media can be accessed online and has the advantage of the other media because the media web interface makes it easy for the student in getting materials and obtaining the content he had learned [2]. So students who are currently studying culinary Adi Buana University Surabaya can access it online in addition to knowledge about the material management of venture catering

In the development of web media synchronized with the addition of a discussion forum. A virtual community forum which is provided to facilitate or offer a variety of information regularly in a specified period. An example of a conference that is often used by students of whom is Asuna and Viva news, both the panel provides a variety of information ranging from scientific, social, political and lifestyle.

Present condition on the study of nutrition has not met demands KKN level 6. Students have not been able to create with their creativity and tend to be less able to analyze the nutrient content of menus prepared. Have not been able to design products that meet nutritional requirements diet, quality, and safety by considering the factors of ease of manufacture based on criteria and pay attention to personal health and safety issue and the consumers. Not obvious inspiration or idea which makes it a source of confusion at the time trials or experiments that can be endless lazy, not excited, frustration and stress.

This development is aimed at students nutrition courses family welfare Education, Undergraduate Faculty of teacher training and educational sciences. From the observations that have been made, the student shows three home economic data is 1). 87.7% of students utilizing the internet to learn, 2). 81.6% is no stranger to the media forum on the internet, 3) 79.5% of students often do a discussion about learning material.

With the data that has been obtained will then be developed "Media Learning Courses Nutrition digital-based e-Learning using Web" and features the android. The Web is going to be the solution because it will cover some of the needs that are required in the learning management system business Foodservice. One is the existence of multimedia, interactive and discussion facility, is also a means of practice.

## **2. The Purpose of the Creation And Development Of Web-Based Digital Learning Materials**

The purpose of the creation and development of web-based digital learning materials on "Media study of nutrition. For undergraduate student Home, economic Adibuana University Surabaya" are (1). Design media learning courses management of Business digital Web-based Foodservice For undergraduate. (2). Create media learning courses Nutrition-based digital Web For undergraduate students home economic. (3) Find out the feasibility of the Media Learning Courses Nutrition-based digital Web. (4) The expected product specifications

The resulting product in development that is web-based. Some of the specifications of this product are: (1) learning the Media presented a web-accessible shape integrated with electronic books or digital books. (2) Learning Media is built using open source applications (open-source) social learning and the use of social software (social networking), such as blogs, wikis, podcasts and Second Life. Used as a learning content management system (CMS) that manage web content managed systems are open source after it's uploaded to hosting and domains so that you can access online 24 hours anywhere. (3) This medium as an e-Learning sharing student on deepening material Business Foodservice Management Home economic Adibuana University Surabaya

## **3. Methods**

This research is the development of research carried out in family welfare education courses, with details of the design are as follows: the Model used in this development was the creation of interactive learning media which contains: primary nutrition material, the determination of the content of the menu nutrition balanced and discussion, as well as manual/operating instructions learning media. Design validation is done by experts (lecturers courses) and validation of users (students) as a field test. Observation, interviews, and tests do engineering data collection. Research instruments include interactive learning through media power received the feasibility of learning media.

## **4. Results and Discussion**

Tutoring of students can be done by utilizing a variety of ways (methods) and with the help of tools (media). The traditional system of learning where students and teachers meet to do the process of teaching and learning is a method that goes up to the present to achieve the primary goal of teaching and learning [12]. This method is very concerned with meetings or face-to-face between teacher and students directly, however, this concept face constraints relating to the limitations of place, location and time of conducting with the ever-increasing activities Student/student and teacher/lecturer [13].

On the system of learning, the student does not need to come to College, to listen to teaching teachers, and so on, but enough teaching at home, working on problems like exercise that occurs in traditional learning methods. The interaction between teachers and students persists with the media that allows the interaction occurred [3]. One of the effort or how that could be done for doing distance learning is to use media internet/intranet, where the role of Web-based device

communication is indispensable. In this study, the concept of Web Learning is used as the basis for the achievement of distance learning. In this case, the Web Server used to store the material mater-in-learning upload by a teacher/lecturer and the client in this case in the form of Android, HP can be used by students to download and do view on materials learning.

Preparation of learning materials that comply with the order delivery time is one step to do the process of coaching students. The concept of distance learning like this should not be separated from the study of pedagogy, where lecturers or teachers are required to guide its student

### **Model-based development of e-Book**

The application of e-books these festive eyes come with access to learning materials learning includes the ability to search for learning materials, displays and reading learning materials as well as save (download) the learning materials. Development of interactive e-Book would have done some studies that cover content (learning materials), software technology applications (software) and media presentations or hardware technology used (hardware) [14]. To build an electronic book can be done in two ways. The first way is to write a book directly by using particular software makers of electronic books. The second confers. This can be done in a paper book is already available but not the format of electronic books. Konfersi can be done by using the 11 converter software.

This electronic book format created by Adobe Systems and is known as a PDF document. This document has a standard text that represents the entire document that is created becomes the document images per his home town. Generally this document frequently. It is found in the websites for download. Because of its relatively small size compared to other materials. Because all records are transferred into the picture, this format has a weakness in the document layout flexibility. A typeface cannot be enlarged except by enlarging the image. PDF documents cannot be filled by the type of multimedia content such as video and animation [15].

This document can be read with acrobat reader made by Adobe Systems. Also, many applications including document readers some browsers can read this document. Browsers that support to read this document is Internet Explorer, Firefox, Opera. To create an electronic book format PDF of many applications that can be used although Adobe Systems did not make this application. The company also provides its electronic book Maker software known as Adobe Acrobat. The free version is provided only for reading PDF documents [3].

Learning materials for learning or e-Book will be carried out analysis and design model application such as facilities for students and professors to access learning resources, facilities for the lecturer to fill material/learning materials. In this study, the selected hardware technology is Android and HP laptops. HP Android this at an affordable price by student [16].

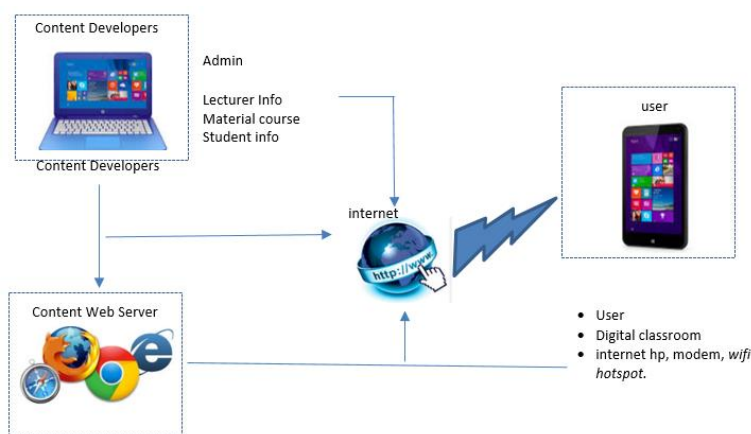
On the application of interactive e-Book, there are 3 types of users, namely 1) administrator; 2) Teacher/lecturer; and 3) students. This application provides some of the functionality associated with activities in the learning process, includes the function upload and publish learning materials for teachers/lecturers learning content management functions, and user management for Administrator and purposes of reading and downloading learning material for students. The application of e-books these festive eyes come with access to learning materials learning includes the ability to search for learning materials, displays and reading learning materials as well as save (download) learning materials [17].

Digital content learning (learning-based digital material) is the initial stage of the development will be focused on the application of interactive e-books used by students and professors to access Website [18]. In this context, the learning materials developed are applications e-Book reader which is used by students to obtain learning material created in

digital form. Students can choose the desired syllabus and reading learning content through the hp tablet or android. The primary functionality that exists in these materials was the learning materials, reading documents online or store the material learned to read in a Web operating system Learning

The concept of a client-server application used to build interactive e-Book, in this case, the server as a repository of learning materials data in format.PDF, while students as a user (client) can access the learning materials with utilizing tablets. The communication process between the client and the server use the concept of HTTP (hypertext transfer protocol). To be able to run communication with HTTP protocol, one of the commonly used way is to use the browser on the client side to access interactive e-Book applications that are stored on the server side [19].

At this stage, the first time that was done was to build interactive e-Book applications on the server side by making use of the Website after that is done the selection of the appropriate and capable browser to access and view the material learning pdf on the client side.



**Fig 1.** Flow Diagram System Interactive Web Technology

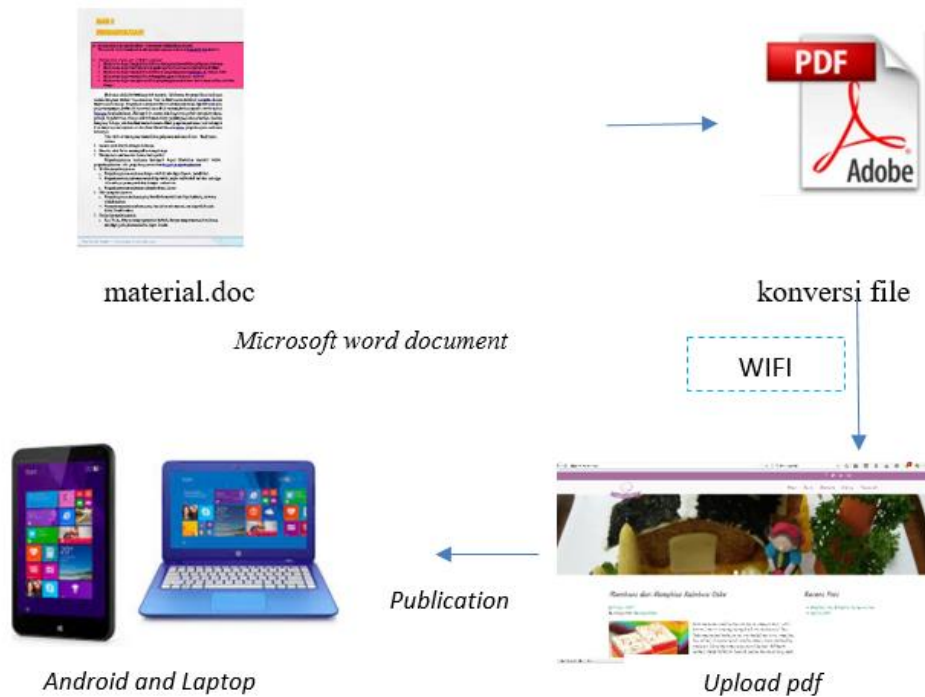
Learning materials access includes the ability to search for learning materials, displays and reading learning materials as well as save (download) the learning materials. Upload the learning materials used by professors to upload the learning materials that have been created although it has provided a terminal to create learning material uploaded at once to the database server, at a fixed tablet application provided features for lecturers to incorporate the content of course [16].

#### Interactive e-book system

Electronic book format PDF reader has many applications in circulation. To create an electronic book format PDF of many applications that can be used. Although Adobe Systems did not make this application. The company also provides its electronic book Maker software known as Adobe Acrobat. The free version is offered only to read the document PDF [19].

To build an electronic book can be done in two ways. The first way is to write a book directly by using particular software makers of electronic books. The second conversion. This can be done in a paper book is already available but not the format of electronic books. Konfersi can be done by using the converter software available.

The following description of the process of the maker of electronic books and software



**Fig 2.** Workflow process electronic book PDF format

Interaction on Interactive e-Book applications used to access learning content. Students choose subjects in this concept is referred to as Standards of competence. The standard of Competency contains the entire Basic Competence that must be understood and mastered by a freshman in a single semester. The menu is standard comment or message from the learning content provided the website. Feature interaction is utilized to Exchange content and information. Web content can be added a feature to send a message or a question, which is permanently integrated data, can be read and written by the readers of the [19].

#### Website Content

The content web server will arrange all the rights the user access digital learning built. The following description of the process of video and image. Learning material nutrition competency-based system, which steps are performed to assess the standard of competence and basic competence subjects as stated on the Content Standard, having regard to the order based on the concept of hierarchy of disciplines and/or the level of difficulty of the material, not necessarily always correspond with the sequence that is in ; The link between the standard of competency and competency basis in teaching 4;

Students can read the material by the desired Basic Competence



**Fig 3.** Process management publish videos from youtube and images

Aspects of content (learning materials), namely electronic books are made requires a reader for easy handling in choosing and searching for a book. Electronic book distribution system can take advantage of internet media device so that reader applications can easily download the books you want to read. Figure 6 shows the build in the ease of access of the video be shown using

## Conclusion

- a. Nutritional Science learning materials have characteristic: can be used as standalone learning material and group, consisting of IX material sorted by the regulations, on any matter is terminated with the exercises and tasks by the objectives of each element.

- b. The means of instruction, which is used in the implementation of the study of Nutrition in the laboratory is the primary means of food. As a proponent of learning in the laboratory equipped with reference books, handbooks, job sheets, and learning media in the form of archive material visualization video learning materials.
- c. Learning materials and learning useful development results in the form of student competence by the demands of the curriculum can be attained by the student KKNi after applying the learning materials and mastering the outcomes of development.

## Suggestion

This product has limitations, especially in terms of limited means, time, and cost. Development, testing, and the introduction of new learning materials for courses implemented Nutrition, because of limiting factors, owned by target research. Trials have not been widely applied, probably because it requires a very long time, financing, and limited time owned facilities and infrastructure to host the learning. For further research addressing the limitations of this study, the researchers suggest teaching materials compiled in the form of videos and interactive digital learning more in price.

## Reference

- [1] A. Mukhadis, 'Sosok Manusia Indonesia Unggul dan Berkarakter Dalam Bidang Teknologi sebagai Tuntutan Hidup di Era Globalisasi', *J. Pendidik. Karakter*, vol. 3, no. 2, pp. 115–136, 2013.
- [2] M. Samani, *Rekonstruksi Pendidikan. Kumpulan Pemikiran tentang Perlunya Mengkontruksi Pendidikan di Indonesia*. Surabaya: UNESA University Press, 2012.
- [3] A. A. Nugroho, 'Pemanfaatan E-Learning Sebagai Salah Satu Bentuk Penerapan TIK Dalam Proses Pembelajaran', *Maj. Ilm. Pembelajaran*, vol. 2, no. 2, pp. 1–13, 2011.
- [4] S. A. Widodo, R. C. I. Prahmana, A. S. Purnami, and Turmudi, 'Teaching materials of algebraic equation', *J. Phys. Conf. Ser.*, vol. 943, no. 1, pp. 1–6, 2017.
- [5] S. A. Widodo, Darhim, and T. Ikhwanudin, 'Improving mathematical problem solving skills through visual media Improving mathematical problem solving skills through visual media', *J. Phys. Conf. Ser.*, vol. 948, no. 1, pp. 1–6, 2018.
- [6] A. Ozsagir, Y. Bayraktutan, and I. Arslan, 'The Relationship between Vocational Education and Industrial Production in Turkey (1975-2007)', *Int. J. Econ. Perspect.*, vol. 4, no. 2, pp. 439–448, 2010.
- [7] Hasbullah, 'Perancangan Dan Implementasi Model Pembelajaran E-Learning Untuk Meningkatkan Kualitas Pembelajaran Di JPTE FPTK UPI', 2008.
- [8] A. Mukhadis, 'Pengembangan Kemampuan Emulasi Melalui Teaching Industry Dalam Pembelajaran Bidang Teknologi di Perguruan Tinggi', in *Kumpulan Pidato Pengukuhan Guru Besar UM*, Malang: UM, 2007, pp. 221–268.
- [9] I. Binanto, *Multimedia Digital Dasar Teori dan Pengembangannya*. Yogyakarta: Andi Offset, 2010.
- [10] T. Vaughan, *Multimedia: Making It Work*. New York: McGraw-Hill, 2011.
- [11] S. Ahmed and D. Parsons, 'Abductive Science Inquiry Using Mobile Devices in The Classroom', *Comput. Educ.*, vol. 63, pp. 62–72, 2013.
- [12] A. Rayandra, *Kreatif Mengembangkan Media Pembelajaran*. Jakarta: GP Press, 2012.
- [13] Daryanto, *Media Pembelajaran: Peranannya Sangat Penting dalam Mencapai Tujuan Pembelajaran*. Yogyakarta: Gava Media, 2010.



- [14] D. France, V. Powell, A. L. Mauchline, K. Welsh, J. Park, W. B. Whalley, and S. Rewhorn, 'Ability Of Students To Recognize The Relationship Between Using Mobile Apps For Learning During Fieldwork And The Development Of Graduate Attributes', *J. Geogr. High. Educ.*, vol. 40, no. 2, pp. 182–192, 2016.
- [15] J. Gikas and M. M. Grant, 'Mobile Computing Devices In Higher Education: Student Perspectives On Learning With Cellphones, Smartphones & Social Media', *Internet High. Educ.*, vol. #19, pp. 13–26, 2013.
- [16] Y. Li, A. Guo, C. L. Chin, and J.-H. Lim, 'A Platform For Creating Smartphone Apps To Enhance Chinese Learning Using Augmented Reality', *Sci. Phone Apps Mob. Devices*, vol. 2, no. 4, pp. 1–12, 2016.
- [17] R. L. Thomas and M. D. E. Fellowes, 'Effectiveness Of Mobile Apps In Teaching Field-Based Identification Skills', *J. Biol. Educ.*, vol. 51, no. 2, pp. 136–143, 2017.
- [18] J. M. Noguera, J. J. Jiménez, and M. C. Osuna-Pérez, 'Development And Evaluation Of A 3d Mobile Application For Learning Manual Therapy In The Physiotherapy', *Comput. Educ.*, vol. 69, pp. 96–108, 2013.
- [19] N. Hopkins, M. Tate, A. Sylvester, and D. Johnstone, 'Motivations For 21st Century School Children To Bring Their Own Device To School', *Inf. Syst. Front.*, vol. 19, no. 5, pp. 1191–1203, 2017.