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WEB-BASED APPLICATION DESIGN OF STUDENT LEARNING STYLE IDENTIFICATOR

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Abstract: Students may have different learning goals and ways of learning that are not similar. Therefore a learning device that is adapted to the learning style of students is very feasible to be realized so that students obtain material with different presentation models according to their needs and suitability in learning. A web-based application that identifies the learning styles of students is designed to help determine the type of learning that students have. The research method uses Research & Development (R & D). System performance is tested using black-box testing methods and alpha-beta validity tests on each system module. Meanwhile the class action method and survey are used to identify the feasibility of the application design. Based on a series of observations and analyzes, it can be concluded that out of 101 students of the Faculty of Communication and Information, 27% had visual learning modalities, 16% auditory, 14% read-write, and 43% kinesthetic. Referring to these results, the use of instructional media adapted to student learning styles is important in achieving a significant increase in mastery and understanding of learning material and this application can help teachers in preparing appropriate teaching strategies.

Keywords: learning media, learning style, web

INTRODUCTION

Researchers have described many definitions of learning styles or learning modalities. According to [1] [2] [3] [4] [5] [6] [7], learning styles imply the most preferred way students learn. From [8] [9] [10] learning styles are defined as learning methods in which students feel the most efficient and effective in processing, storing and taking something they learn. Meanwhile, learning styles have been concluded by [11] [12] [13] [14] [15] as different and different ways for each student in learning. Other definitions according to [16] [17] learning styles are skills and behaviors that determine how students like the learning process.

Learning styles can influence the effectiveness of training, whether training is available online or in a more traditional way [18] [19] [20]. [21] categorizes learning styles into wholist-analists and verbalizer-imagers. The type of wholist analysis describes the way individuals process and understand information. Wholist prefers to study material globally. If not, analysts prefer details in processing information. Verbaliser-imager describes how individuals disclose information. Verbalisers prefer to present information in the form of words, while imagers tend to like presenting information in pictorial form. [22] refer to a wholist-analists as a wholist-serialist. According to [22], wholists will choose how to study material with a global view and

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then be followed by processing in detail. Literary learners tend to follow step by step learning processes. Other views according to [16], wholist and serialist are known as global and sequential, while verbalizer and imager are known as verbal and visual. Sequential type students tend to learn in linear steps which are part of step by step. Global learners prefer to study material in an unorganized way. [23] states that modalities or learning styles are divided into four categories (As quoted in [24]). [12] implies that learning styles can be classified as visual, auditory, read / write, and kinesthetic (VARK). [25] revealed that most students (students) can be grouped into visual, auditory, and kinesthetic learners depending on how they receive and process information. Visual students do learning effectively when they see material. Hearing type students prefer learning by hearing, while kinesthetic students are students who have the best way of learning with practice. These three ways of learning are known as VAK learning styles. Thus the VAK learning style is related to the sense of human observation, namely vision, hearing, and movement. Thus according to [25] students can at least be categorized into one of the three preferred learning styles, namely visual, auditory, or kinesthetic.

APPROACH & RESEARCH METHOD

This research was conducted using Research & Development method. The R & D steps in this study are simplified into four stages: the exploration phase, the model development stage, the model testing phase, and the dissemination stage. The exploration phase is carried out by conducting relevant theoretical studies, assessing the quality of existing models and conducting needs analysis, and making product specifications. The development phase includes the preparation of a model based on specification requirements, testing the design of the field model (to be said to be qualitative), producing a model of test results. The testing and evaluation phase is carried out to test the effectiveness of the model through a series of experiments with test cases.

The website-based learning style identification application is equipped with features to analyze and calculate the percentage of learning styles based on the study program and gender of students. This application is built with the PHP programming language and MySQL database.

Contains exposure in the form of paragraphs that contain the time and place of research, design, material / subject of research, procedures / techniques of data collection, instruments, and data analysis techniques as well as other matters relating to the method of research, with article length 10-15% of total length of article. The research design can be made according to the needs of the subtitles such as research subjects, tools and materials (if necessary), methods and research designs, data collection techniques, and data analysis and interpretation.

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RESULTS AND DISCUSSION

a. Application View

This study produced a web-based learning style identification application. This application is used to help students determine their learning style trends and be accompanied by information about the right learning solutions. In addition, the results of the analysis of the categorization of student learning styles from this application can help lecturers to know the tendency of student learning styles both male and female students so that they can help lecturers develop more appropriate learning strategies. The existence of this web-based application also increases the time efficiency in the questionnaire when compared to the application of paper-based questionnaire papers. In Figure 1a, a questionnaire from VARK Version 7.1 is presented. Visitors (students) are then asked to complete at least 12 questions and can choose more than one answer from the available answer options. After students have finished answering a number of questions, the results of the filling can be processed by clicking "Save" to begin the process of analyzing the learning style as shown in Figure 1b below.

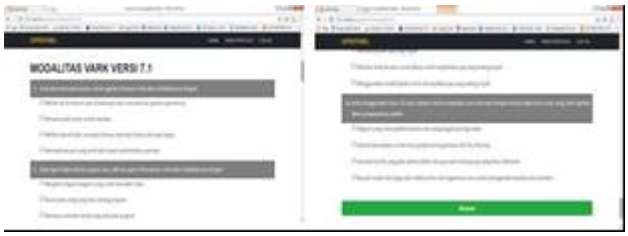

Figure 1. (a) questionnaire question page, (b) 'save' button for processing

On the results page displayed the results of weighting the answer. Furthermore, the learning style categorization is calculated based on the tolerance points specified in the system. In Figure 2 there is a complete biodata of visitors, points for each type of learning style, and trends in the type of learning style. If the learning style button is clicked, then the learning solution will be presented.

Figure 2. The results of the analysis page determine the learning style

Figure 3 shows a description of how a student with a predetermined learning style can receive, store, and communicate information well. It also displays appropriate learning strategies or learning solutions for use by owners of learning styles.

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Figure 3. Learning suggestion page

b. Data Analysis data

Analysis Based on Types of Learning Style Preferences. The equation used to calculate the percentage of learning style results based on the study program is shown in Equation 1 below.

$$Y_{Z,X} = \frac{\sum (X,Y)_Z}{\sum X_Z} x100\%$$

Where present learning modality percentage y in department z with gender x, is sum of students with gender x and learning modality y in department z, and states sum of students with gender x in department z. Informatics Department students have a tendency towards AKRV-K-A = AK-AKR learning styles, where A: auditory, K: kinesthetic, V: visual, R: read / write. In Table 3 the percentage of results is presented.

Table 3. Percentage of student learning styles of Informatics Department

LEARNING STYLE	PERCENTAGE
AUDITORY	11,76
READ/WRITE	1,96
KINESTHETIC	15,68
AUDITORY-KINESTHETIC	11,76
AUDITORY-READ/WRITE	1,96
KINESTHETIC-READ/WRITE	1,96
AUDITORY-KINESTHETIC-READ/WRITE	9
AUDITORY-READ/WRITE-VISUAL	7,84

Communication Department students have a tendency to learning styles A-K-AKR-AKV = AK = AR, where A: auditory, K: kinesthetic, V: visual, R: read / write. In Table 4 the percentage of results is presented.

Table 4. Percentage of student learning styles of Communication Department

LEARNING STYLE	PERCENTAGE
AUDITORY	34

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KINESTHETIC	20
KINESTHETIC-VISUAL	4
AUDITORY-KINESTHETIC	6
AUDITORY-READ/WRITE	6
AUDITORY-KINESTHETIC-READ/WRITE	12
AUDITORY-KINESTHETIC-VISUAL	6

CONCLUSION

This paper proposes an application model for determining learning style preferences in the learning process. Applications that are made can determine the percentage of trends in student learning styles in accordance with set-point restrictions and may also indicate the percentage of overall learning styles based on gender in accordance with existing study programs at the Faculty of Communication and Information. Based on the results of the questionnaire on respondents at the Faculty of Communication and Information, it can be concluded that as many as 87% of respondents agree with the application of student learning style preferences made with easy-to-use assessments, can provide a determination of learning style information, and look attractive. Additional conclusion is that the results obtained from this application, the teacher must realize that students have different learning styles so it is necessary to develop and organize appropriate teaching strategies in the learning process.

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