Implementation of VARK Learning Styles in the MOOC User Interface Design

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Abstract: The development of technology has a lot of influence on the current educational process. One of the effects of technology is the development of Massive Open Online Course (MOOC) learning media which is still part of e-learning. Massive and open MOOC has its own challenges in terms of scalability. Therefore, many researchers are now starting to develop interface designs that are in accordance with the characteristics of the students. This study aims to identify the learning styles of students in the MOOC course. The identification of student learning styles is done by filling out questionnaires that focus on the VARK method (Visual, Aural, Read, Kinetic). The results of the questionnaire analysis will be used as the basis by the researchers in designing the MOOC user interface that applies the VARK learning style.

1 INTRODUCTION

E-learning has influenced the development of other online-based learning platforms, such as the MOOC (massive open online course). Several universities and international non-profit institutions have developed MOOC which is quite popular, such as edX, Coursera, Udacity, and others. Indonesia has a MOOCs site that was developed seriously and can be used free of charge, one of which is MOOC IndonesiaX which was launched to coincide on the 70th Independence Day of the Republic of Indonesia. IndonesiaX cooperating with the Universitas Indonesia, Institut Teknologi Bandung, PT Net Mediatama Televisi and several other well-known Institutions (Rachmatunisa, 2015).

There are several parameters needed to measure the quality of MOOC (KampusUNJ, 2016) including how the MOOC site presents content, how much learning material is offered. In addition, supporting institutions and institutions are no less important in the sustainability of a MOOC. Because institutions with good credibility will contribute and trust users. Then the total visitors and popularity of social media became several benchmarks for a MOOC. In another study that measured the Successful (Yousef et al., 2014) and Effectiveness (Gamage et al., 2015) of the MOOC, from the two studies, there were similarities in how a learning site would run successfully and effectively if the media could present exercises that rep-

resented all existing material and provide testing that measurable for users. The appearance of a MOOC site also has a large effect on effectiveness, because the user interface that is easy to remember and attracts visuals in the eyes will make users easier to understand and can follow learning well. Recognizing the importance of good MOOC content, many developers seriously pay attention to the look and content of the sites built. This can be seen from many sites that emphasize content, such as practice questions on each material presented, the use of videos is also used in the delivery of lecture material and the use of slides containing text material lectures..

Previous research has carried out innovations in developing content at the MOOC, including the incorporation of AIED (artificial intelligence in education) (Kay et al., 2013) ITS (intelligence tutoring system) (Baneres and Saíz, 2016), integration at SG (Serious Games) (Freire et al., 2014), and a scheme for displays high-resolution video called DASH (Dynamic adaptive streaming over HTTP) (Wang et al., 2015). However, despite the many innovations made in the development of MOOC, the combination of learning styles and user interface design has not been widely developed by researchers.

In this study, the author tries to look at the characteristics of learning styles in students at the Akademi Komunitas Industri Tekstil dan Produk Tekstil Surakarta (AK-Tekstil Solo). AK-Tekstil Solo is under the auspices of the Ministry of Industry and is

the first Community Academy in Indonesia that has implemented dual systems in the learning process. Dual system is an education system that applies theory and practice directly to industry, in this context the textile industry. As the pioneer of the Community Academy, the AK-Tekstil Solo can be a model for other vocational schools. The study was conducted by identifying learning styles from student samples, then the results of the data analysis will be used as a reference to create a user interface design. By combining learning styles and MOOC the authors hope that participants can experience a different user experience in online-based learning.

2 LITERATURE REVIEW

2.1 Massive Open Online Course (MOOC)

MOOC based on its acronym (Kay et al., 2013) has three meanings for each element. Open, means that it can be accessed by everyone or all circles. Besides that, being open can also mean that users can access the MOOC site for free anytime and anywhere. Online elements mean that people can access this site with an internet network. Then in the course elements, this learning method has become a benchmark for innovation in the education process. Because a class offered usually presents the whole course material or one course material with integrated learning material and formative assessment. These classes are managed by instructors from the world's top institutions. At present, there are several MOOCs that are quite popular and are widely used throughout the world, some of which are Coursera, edX, and Udacity.

2.2 Learning Style

The learning process is the most crucial stage for every individual who is conducting lectures. Each individual has an obligation to study the material in the class that they follow, but now the learning process that provides the most effective outcomes still does not have a standard. Therefore, many researchers apply theory to learning styles in the educational process.

2.3 VARK Learning Style

One model of learning styles that have been used in learning media today is VARK (Visual Aural Read

Kinetic). VARK represents several aspects of the concept of learning, where each of these aspects can be selected by the training participants according to their needs. VARK (Díaz et al., 2018) which is an acronym of several words, the first is visual, which is how a material can be delivered with visual images such as tables, diagrams, symbols, and images. Second, is aural, which is how learning material is delivered with the help of audio, sound, pronunciation, conversation, discussion and so on. Simply put, from the application of the aural principle, there are features provided for fellow users to communicate on a media, such as chat and discussion forum features. Third, read/write is a model that we can find in teaching and learning activities in general, namely where the instructor and class participants can read the material provided and write both reports, essay questions, and other exercises. Then the last one is kinetic, which is how the material delivered can make participants feel as if it is real so that it has the effect of a different experience in learning. A simple example of kinetic is the use of demonstrations, simulations, videos and films.

Figure 1: VARK Learning Style (Mitchell et al., 2015)

3 OBJECTIVE OF THIS STUDY

a. Propose the concept of designing the interface of the MOOC and testing the participants
b. Develop an appearance by combining user learning styles.

4 METHODOLOGY

This research is conduct to look at the number of learning styles that are widely used in AK-Tekstil Solo. The research method used was by filling out questionnaires based on VARK's learning style. The research method used was by filling out questionnaires based on VARK's learning style. The questionnaires are adapt from the vark-learn.com website by translating into Indonesian. Assessment on the

questionnaire used a 1-5 Likert scale with point 1 to strongly disagree until point 5 to strongly agree.

The subjects of the study were all active AK-Tekstil Solo students, both who were undergoing level 1 and level 2 and were willing to take part in the study. The questionnaire was filled out by 50 students with study programs on weaving engineering and garment engineering. Then to determine the final value and trend of student learning styles, the summation of each of the questions given is done. Questions are divided into four parts which are distinguished based on Visual, Aural, Read / Write, and Kinesthetic learning styles.

5 RESULT

Respondent data is an important element in a study that uses questionnaires. The following table is complete data from respondents in this study.

Table 1: Respondents

Characteristic	Amount	Percentage
SEX		
MALE	15	30%
FEMALE	35	70%
DEPARTMENT		
TEKNIK PEMBUATAN GARMEN	35	70%
TEKNIK PEMBUATAN KAIN TENUN	15	20%
AGE	18-28 YEARS OLD	

Based on the data in the table, the respondents who filled out this questionnaire were 50 people consisting of 35 women and 15 men. Students who participate in this research come from study programs Teknik Pembuatan Kain Tenun and Teknik Pembuatan Garmen. The age range of respondents is 18 to 28 years.
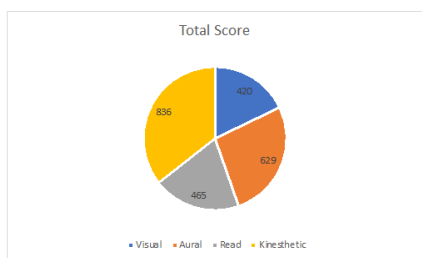

Figure 2: Total Score

Based on the total score of the chart it can be seen that kinetic is the learning style that is most chosen by students, aural is second learning style that is most chosen with total score 629, the third learning style that is most chosen are read and the less that is chosen by students is visual.
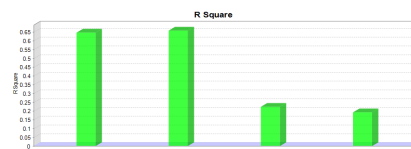

Figure 3: R Square Chart

Based on the testing of the structural model which can be seen in Figure 3, it is not much different from the total score described in the form of a pie chart. The learning style that is most often done or sought after by students is the Kinesthetic learning style, followed by aural, read and final learning styles are visual. Further explanation of the analysis carried out can be seen in Figure 4.

	R Square	R Square Adjusted
Aural	0.646	0.639
Kinesthetic	0.658	0.650
Read	0.224	0.207
Visual	0.192	0.175

Figure 4: R Square Details

In testing the inner model can be seen the difference in the values that have been analyzed. Kinestetic and aural are still the best grades that are most sought after by students. While learning styles such as reading and displaying images are less in accordance with student learning style preferences.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Learning Style -> Visual	0.438	0.658	0.112	3.911	0.000
Learning Style -> Read	0.473	0.670	0.130	3.648	0.000
Learning Style -> Kinesthetic	0.811	0.719	0.262	3.099	0.002
Learning Style -> Aural	0.804	0.759	0.217	3.703	0.000

Figure 5: Hyphothesis

In the hypothesis test the existing value can be accepted if it has the following conditions:

1. Jika nilai dari T Statistic $> 1,96$

2. Jika nilai dari P Values $< 0,05$

Based on the data in the picture, the analysis can be concluded as follows:

1. Visual
   $3,911 > 1,96$ is accepted

2. Read
   $3,648 > 1,96$ is accepted

3. Kinesthetic
   $3,099 > 1,96$ is accepted

4. Aural

3,703 > 1,96 is accepted

Then for the value values all the learning style criteria have a value that is smaller than the 0.05 threshold so that this hypothesis can be accepted.

6 CONCLUSIONS

Based on the results of the analysis that has been done, it can be concluded that the learning styles that are most in demand by AK-Tekstil Solo students are Kinesthetic followed by Aural learning styles. However, for the Visual learning style and Read not so much liked by students. Therefore, the user interface design that will be designed will focus on a learning style that the majority is chosen by students. In further research, MOOC will be conducted by combining Aural learning styles. Because this learning style is a teaching method that most closely resembles the process with conventional classes.

Consideration of researchers not to focus on the design with kinesthetic learning styles because the learning criteria with this method require several other tools so that the student learning experience can be felt. Whereas aural focuses on sound and student communication with classmates and lecturers who teach. The learning style chosen by AK-Tekstil Solo students is closely related to the learning system that has been carried out. Because, vocational schools are schools that focus more on practical subjects. Therefore, the majority of students choose a learning style that involves a lot of physical activity and discussions with colleagues. In further research, researchers hope to design the MOOC user interface in the textile field by involving all existing learning styles. So that later each student can choose material directly in accordance with their learning style preferences. Then, the final results of the classes that have been followed can be carried out further research regarding the relevance of student achievement to the learning material carried out.

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