Analysis of learning multimedia development needs for network infrastructure architecture

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Abstract. Analysis of the need for media is expected to help the school in terms of the use of technologies based on its development. The use of media in learning following the characteristics of students is one of the factors that support the media in the learning process. The need analysis of this media can be used as a reference for making decisions in using multimedia as one of the supporting factors of learning. Avoiding technological developments now is not an option, neither is learning. Inadequate interactive learning media learning is less effective. Analysis of the needs of this media can be one of the factors that support the media in the learning process. Based on the data that has been obtained, the researchers found the results of the achievement of targets from the analysis of the need for media in learning to be in the “needed” category. The results of this data processing confirm that the need for media in learning is “needed” to facilitate the learning process in the classroom.

1. Introduction

Existing learning with the learning process is still conventional with the condition of the teacher explaining the material using lecture techniques. Several things can be seen related to the use of interactive media in SMK Negeri 2 Depok, namely: the unavailability of interactive multimedia and materials in architectural subjects. network infrastructure. The availability of supporting media in the form of interactive multimedia has not yet been applied, supporting media for the learning process in the form of textbooks only.

Learning aims to influence students to learn, it can be called the process of learning students. Where the learning process becomes more effective when efforts made to improve the quality of learning pay attention to efforts to increase understanding and improve the learning process [1]. One of the external factors that influence learning outcomes includes learning media. In this case the needs analysis is the initial stage in designing every type of educational activity that takes place [2].

Learning needs belong to what the learner needs to do in order to learn. One effort to increase understanding and improve the learning process is the use of multi interactive learning media. Multimedia interactive learning that strongly supported by the development of highly advanced technology. Technology provides new space where learning can occur in various ways so that avoiding technology is no longer an option, but how to use existing technology in an effective way for education. Technology and media can play a large role in the learning process. If teaching is centered on the teacher or educator, technology and media are used to support the presentation in teaching. On the other hand, if teaching is student-centered, students are the main users of technology and media.
Multimedia learning takes an important role in conveying information, where computer-based multimedia enhances a minimalist text-oriented computer interface and produces satisfying profits by finding and attracting interest and interest; multimedia strengthens memory of information. Multimedia can make an effective learning impossible, if the text, charts, photos or images, audio, video, animation, and simulation are interactively combined.

Two things are of concern in learning network infrastructure architecture in class XI of SMK Negeri 2 Depok, the types of media used and the availability of media in the learning process. Based on observations made, the type of media that is often used in classroom learning is printed books. Printed books are the only mainstay of media for teachers to explain and explain the material and provide assignments during the learning process. It was also understood that there was no alternative media to support the learning process.

The use of media that is in line with the needs and characteristics of students is also supported by 2008 learning technology, namely ethical studies and practices in facilitating learning and improving performance through creating, using, and managing appropriate technological processes and resources. To facilitate learning and improve performance by creating, using/utilizing, and managing appropriate technological processes and resources is the definition of learning technology, where this can be one of the factors that support the use of media in the learning process.

The development of learning components such as media, curriculum, and other instructional designs can never be separated from the principles of how learners learn. The application of learning media greatly influences the attainment of changes in children's behavior, children's creativity is increasingly developing with a very supportive media [3].

The enterprise of analyzing the initial needs must be done carefully so that there is no gap between everything planned and what is expected. Needs analysis will make it easier for educators to prepare their teaching materials. Availability of the craved learning based on the results of the needs analysis, the developer designs it according to the objectives to be achieved by educators and students [4]. The teacher also needs how to way they can effectively integrate instructional media in the class of the learning process [5]. Therefore it is necessary to have additional alternative media that can be a tool to facilitate students following the characteristics and needs of students of class XI.

2. Methods
In this research using quantitative descriptive methods using a questionnaire to analyze the needs of the media in SMK Negeri 2 Depok. The questionnaire used is based on several aspects including aspects of needs and aspects of attractiveness, which are adapted to the characteristics of students. the aspect of the need refers to the background of students with the use of media that being used. The attractiveness aspect refers to the media criteria which are relevant for students both from the appearance and content in the media.

Four response columns are provided for students, which strongly disagree, disagree, agree, and strongly agree with regard to the statements that have been provided. The use of a questionnaire in this study by giving a few statements to students then students respond by putting a checkmark in the column that has been provided, as follows:

| No. | Statement                                      | S  | D  | D  | A  | S  |
|-----|-----------------------------------------------|----|----|----|----|----|
| 1.  | Learning to use books is very fun             |    |    |    |    |    |
| 2.  | I need a new type of learning media besides books |    |    |    |    |    |
| 3.  | I am happy when there are only texts in the learning media |    |    |    |    |    |
|     | Attractive aspect                             |    |    |    |    |    |
| 4.  | I am happy when there is audio in the learning media |    |    |    |    |    |
| 5.  | I am happy when there are videos in learning media |    |    |    |    |    |
| 6.  | I am happy when there are pictures in the learning media |    |    |    |    |    |
Table 1. Cont.

|   |   |
|---|---|
| 7. | I am happy when there is animation in learning media |
| 8. | I am happy when there is text, audio, and video in learning media |
| 9. | I am happy when there are text, images, and animations in learning media |
| 10. | I am happy when there are texts, videos, and animations in learning media |

Information:
- SD : Strongly Disagree
- D  : Disagree
- A  : Agree
- SA : Strongly Agree

3. Result and discussion

Needs analysis represents an important role in developing material and producing tools to help teachers design material according to the needs of the target learners and learning needs [6]. The combination of media and learning approaches will facilitate a comprehensive understanding of the material [7]. Outcomes from this study that shows the level of students' needs towards the media as one of the factors that support the process of learning. The stages carried out in data collection through this questionnaire, by analyzing data from existing questionnaires by providing criteria of the aspects of the needs and aspects of the attractiveness of learning media using quantitative data obtained from student assessment results [8]. Scores were no changed when in the data in the form of intervals of quantitative data is then converted to the data qualitatively using a scale of 5.

Through the stages of Berikut taken after the students' responses obtained as quantitative data, qualitative data will be converted into the according to the conversion table below:

| Score Value (Interval Data) | Interpretation (Qualitative Data) |
|-----------------------------|-----------------------------------|
| 5                           | Very Needed                       |
| 4                           | Needed                            |
| 3                           | Enough                            |
| 2                           | Less Needed                       |
| 1                           | Very Little Needed                |

Based on the results of the data after going through the conversion stage, the existing data is then processed by finding the mean using the formula stated by Usman & Setyadi [9]:

$$\bar{X} = \frac{\sum x}{N}$$

Information :
- $\bar{X}$ : Average Score of Each Component
- $\sum x$ : Total score
- $N$ : Number of Indicators Assessed

After an average score of each component is known, then the data obtained is converted into qualitative data by referring to a conversion proposed by Widoyoko [10] as follows.
Table 3. A slightly more complex table with a narrow caption.

| Range of scores | Average Score | Category       |
|-----------------|---------------|----------------|
| $X > \bar{X} i + 1,8 \text{ sbi}$ | $X > 3,4$ | Very Needed  |
| $\bar{X} i + 0,6 \text{ sbi} < X \leq \bar{X} i + 1,8 \text{ sbi}$ | $2,8 < X \leq 3,4$ | Needed        |
| $\bar{X} i - 0,6 \text{ sbi} < X \leq \bar{X} i + 0,6 \text{ sbi}$ | $2,2 < X \leq 2,8$ | Enough        |
| $\bar{X} i - 1,8 \text{ sbi} < X \leq \bar{X} i - 0,6 \text{ sbi}$ | $1,6 < X \leq 2,2$ | Less Needed   |
| $X \leq \bar{X} i - 1,8 \text{ sbi}$ | $X \leq 1,6$ | Very Little Needed |

Information:

$X$ : Average Score
$\bar{X} i$ : Rata-rata ideal
$sbi$ : Standard Deviation

The next stage is to apply the conversion formula using a scale of 5 where the instrument used using a maximum score is 4 and the minimum score is 1. The following is the result of applying the conversion to a scale of 5.

| Scale | Calculation |
|-------|-------------|
| 5     | $X > \bar{X} i + 1,8 \text{ sbi}$ |
|       | $= X > 2,5 + (1,8 \times 0,5)$ |
|       | $= X > 2,5 + 0,9$ |
|       | $= X > 3,4$ |
| 4     | $\bar{X} i + 0,6 \text{ sbi} < X \leq \bar{X} i + 1,8 \text{ sbi}$ |
|       | $= 2,5 + (0,6 \times 0,5) < X \leq 2,5 + (1,8 \times 0,5)$ |
|       | $= 2,5 + 0,3 < X \leq 3,4$ |
|       | $= 2,8 < X \leq 3,4$ |
| 3     | $\bar{X} i - 0,6 \text{ sbi} < X \leq \bar{X} i + 0,6 \text{ sbi}$ |
|       | $= 2,5 - 0,3 < X \leq 2,8$ |
|       | $= 2,2 < X \leq 2,8$ |
| 2     | $\bar{X} i - 1,8 \text{ sbi} < X \leq \bar{X} i - 0,6 \text{ sbi}$ |
|       | $= 2,5 - (1,8 \times 0,5) < X \leq 2,2$ |
|       | $= 2,5 - 0,9 < X \leq 2,2$ |
|       | $= 1,6 < X \leq 2,2$ |
| 1     | $X \leq \bar{X} i - 1,8 \text{ sbi}$ |
|       | $= X \leq 2,5 - 0,9$ |
|       | $= X \leq 1,6$ |

Based on the results of the calculations above, it can be seen the results of the 1-5 scale conversion used as a reference to assess student needs are as follows.
Table 5. The results of quantitative and qualitative data conversion.

| Quantitative Data | Range       | Qualitative Data |
|-------------------|-------------|------------------|
| 5                 | $X > 3.4$   | Very Needed      |
| 4                 | $2.8 < X \leq 3.4$ | Needed          |
| 3                 | $2.2 < X \leq 2.8$ | Enough          |
| 2                 | $1.6 < X \leq 2.2$ | Less Needed     |
| 1                 | $X \leq 1.6$ | Very Little Needed |

Informs that learning to utilize media technology provides a significant effect on learning [11]. In connection with the results of the data found, which shows the achievement of targets from the analysis of needs for this media are in the category of “Needed”.

Based on the data that has been obtained, the researchers found the results of the achievement of targets from the analysis of the need for media in learning to be in the “Needed” category. In connection with the results of this data processing confirm that the need for media in learning is “Needed” to facilitate the learning process in the classroom.

4. Conclusion

The conclusion after this research is that it can be seen that the media is “Needed” in supporting the learning process as one part to facilitate learning so that learning objectives can be fully achieved. This study is a preliminary analysis need conducted by the researchers to develop multimedia products interactive learning as solutions to problems in learning.

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