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A System Usability Scale for Development of YouTube API-based E-Learning Module

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Abstract

E-learning is formal and non-formal learning carried out using technology, allowing students and teachers to conduct teaching and learning processes using electronic media. By using the e-learning module, YouTube can be included to create material and to ease learning. However, a lot of educational videos on YouTube cover ground already well-covered. Accordingly, the audience cannot skip unnecessary things. Therefore, a YouTube API-based e-learning module was built to help users learn the material effectively. A System Usability Scale (SUS) was employed in this study, allowing easier data collection using a questionnaire. The data analysis acquired a score of 68 (B), signifying the usefulness of the module. The module provided convenience to the users to grasp the material in a brief time.

Keywords: *Youtube API, Youtube, E-Learning, Module.*

1. Introduction

E-learning, short for education by electronic means, refers to the practice of both formal and informal education that takes place online. In this model, both students and teachers employ various forms of electronic media to facilitate the learning process [1]. Because e-learning occurs in the digital realm, teachers and students have constant, global access. One way to make things easier for teachers is to incorporate YouTube videos within the e-learning program [2]. However, a lot of instructional videos on YouTube cover topics that are obvious and do not require any further explanation. Hence, viewers are unable to skip over unnecessary parts of content [3]. Therefore, this study intends to build a YouTube API-based e-learning module to help students study more efficiently.

As a reference, this study looks at prior studies. This literature study aims to compare objects utilized in various research on developing e-learning modules. A study on online mathematics education applying an LMS-based interactive module to teach students spatial concepts has been reported in an article entitled "E-Learning Development Through Interactive Modules Based on Learning Content Development Systems" [4]. Another study focused on studying simulations and digital communication by producing an LMS-based e-learning module as a practical and valid interactive medium [5]. Studying project-based learning (PjBL) to create online physics lesson plans has also been performed [5].

The differences between previous research and this study include the following two issues: (1) the object of the research carried out is the YouTube API, and (2) this module can be moved immediately to the minute when the material is available. Conversely, the similarity lies in the production of e-learning modules.

This study employed Moodle and the system usability scale (SUS). With its flexible e-learning features, the Moodle application is a user-friendly learning management system (LMS) solution that can be customized to meet individual needs [7]. Developed in 1986, SUS is a questionnaire that assesses an application's usefulness [8]. Historically, SUS was employed to test office electronic systems.

2. Method

Figure 1. System Usability Score

This study utilized both quantitative and qualitative methods and SUS. Quantitative research extensively applies numerical variables and percentages throughout the research process, from data collection to analysis and presentation [9]. One of the three methods utilized to compile the data for this study was a questionnaire. The most common method of gathering information from survey takers is using questionnaires. There are three ways in which questionnaires can be sent to respondents: (1) directly, (2) through the mail, and (3) using electronic mail or the Internet. Researchers can send questionnaires directly to respondents if the distance between them is not too great and the distribution is not too dispersed [10, 11, 12]. After collecting survey data, a qualitative method was employed for the analysis. The researcher was the one who decided how well the respondent did on each item. Decisions constituted the basis of scores [13].

3. Results and Discussion

This study utilized SUS to collect data. For the completed course questionnaire, questions with odd numbers were subtracted from 1 (X-1), and those with even numbers were subtracted from 5 (X-5). Subsequently, the result was multiplied by 2.5. The questionnaire contained the following questions.

Table 1. SUS's Questionnaire Items

No	Question
1	I think I will use this system again.
2	I think this system is complex.
3	I find this system easy to use.
4	I need help from others or technicians in using this system.
5	I feel that the system features work as they should.
6	I feel there are many inconsistent things in this system.
7	I feel like others will figure out how to use this system quickly.
8	I find this system confusing.
9	I feel there are no obstacles to using this system.
10	I need to get used to it first before using this system.

The following are the questionnaire results.

Table 2. Questionnaire Results

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Score (Total x 2.5)
Respondent 1	4	1	5	1	4	1	4	1	5	1	37	92.5
Respondent 2	5	5	5	5	5	5	5	5	5	5	20	50
Respondent 3	3	3	4	3	3	3	3	3	3	4	20	50
Respondent 4	2	2	5	4	5	4	4	4	4	5	21	52.5
Respondent 5	4	2	4	2	4	2	4	2	4	4	28	70
Respondent 6	3	2	4	2	4	3	4	3	2	5	22	55
Respondent 7	4	3	4	2	4	3	4	2	2	3	25	62.5
Respondent 8	5	1	5	2	4	2	4	1	5	2	35	87.5
Respondent 9	5	1	5	1	5	1	5	1	5	1	40	100
Respondent 10	4	2	4	2	4	2	3	2	4	4	27	67.5
Respondent 11	4	2	4	2	3	3	4	3	4	4	25	62.5

The average total score was determined in the following formula.

$$x = \frac{\Sigma x}{n}$$

x = Average score
Σx = Total SUS score
N = Number of respondents

Thus, it yielded a score of 68 (B).

These results explain that the design of this system can be continued until it becomes an application that can be implemented. SUS is important to find out how much users need the application and can provide an initial picture before the application is developed.

4. Conclusion

The System Usability Scale (SUS) provides a "quick and dirty", reliable tool for measuring the usability. The e-learning module built based on the YouTube API was a success. This module served a purpose; specifically, it allowed participants to grasp the content without watching the entire film on YouTube. The module was determined to be Good, with a 68 (B) score based on data processed from questionnaires. A SUS score above a 68 would be considered above average and anything below 68 is below average, however the best way to interpret your results involves "normalizing" the scores to produce a percentile ranking.

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