



DEVELOPMENT OF A DESKTOP-BASED INFORMATION SYSTEM FOR REPORTING STUDENT LEARNING RESULTS AT SMK NEGERI 1 TINAMBUNG

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Abstract

This research aims to determine: (1) the stages of developing a desktop-based information system for reporting student learning outcomes at SMK Negeri 1 Tinambung, and (2) the efficiency of developing a desktop-based information system for reporting student learning outcomes at SMK Negeri 1 Tinambung. The research method used is the Research and Development (R&D) method. The process of developing a desktop-based student learning outcomes report at SMK Negeri 1 Tinambung refers to the ADDIE development model including the analysis stage, design stage, development stage, implementation stage, and evaluation stage. The results of the research show that the development of a desktop-based student learning outcomes report information system at SMK Negeri 1 Tinambung is said to be efficient based on the Usability aspect test which includes the Usefulness aspect, the Ease-of-Use aspect, the Ease of Learning aspect, and the Satisfaction aspect. The information system for reporting student learning outcomes is said to be efficient because it is in the very good category. It is hoped that this system can make it easier for users to process student learning outcomes reports at SMK Negeri 1 Tinambung.

Keywords: ADDIE, Development, Report Cards, Information Systems, Usability

1. INTRODUCTION

Learning outcomes assessment functions to monitor student progress, monitor learning outcomes, and detect the need to improve student learning outcomes by graduate competency standards or methods for teachers in the following semester. Based on the Minister of Education and Culture Regulation Number 66 of 2013 concerning Educational Assessment Standards Article 1, for the implementation "assessment of student learning outcomes at primary and secondary education levels is carried out based on national education assessment standards that apply nationally". Meanwhile, educational assessment standards are criteria regarding mechanisms, procedures, and instruments for assessing student learning outcomes (Permendikbud, 2013).

At the end of each semester, schools conduct assessments to measure the academic development of students in the semester that has passed. Each teacher processes the grades and then submits them to each homeroom teacher. Each homeroom teacher then collects and makes one document of the assessment so that it becomes one document called a student report card. From the results of observations made by researchers at SMK Negeri 1 Tinambung, at the end of each semester, a final assessment documentation is held to determine the level of students' abilities. The student report card processing system is computerized using the Microsoft Excel application.

The homeroom teacher receives subject grades from each subject teacher which will be processed into a report card to be shown to the students' parents/guardians. The report processing process carried out at SMK Negeri 1 Tinambung uses a report card application designed/made using Microsoft Excel which can be said to be less efficient. Several problems occur in making reports on student learning outcomes (report cards), including (1) processing student learning outcomes (report cards) still uses the Microsoft Excel application which can be said to be still simple; (2) the homeroom teacher re-enters the grades received from each subject teacher; (3) the student learning outcomes report application used has a simple appearance consisting of several sheets (cover, student bio-data, biodata database, report card, school database, report card database, back and description) and the level of security for access is not exists, so anyone can see and even change its contents.



2. THEORETICAL BASIS

Sitorus and Sakban (2021) stated that a system is a series of two or more components that are interrelated and interact to achieve a goal. As an illustration, if in a system there are elements that do not provide benefits in achieving the same goal, then these elements are definitely not part of the system (Mulyanto et al., 2020). In general, information can be defined as data that is processed into a more meaningful form for those who receive it. According to McLeod, quoted by Yakub (2012) in the book *Understanding Information Systems*, information is data that is processed into a more useful and meaningful form for those who receive it. Meanwhile, according to Sutabri (2012) in the book *Information Systems Analysis*, information is data that has been classified, or processed or interpreted for use in the decision-making process.

An information system is a system within an organization that meets daily transaction processing needs that support managerial organizational functions in the strategic activities of an organization to be able to provide certain external parties with the necessary reports (Sutabri, 2005). Learning outcomes are real changes in student behavior after the teaching and learning process is carried out by the teaching objectives (Jihad and Haris, 2010).

Microsoft Excel is a form of application that is part of Microsoft Office. Microsoft Excel is usually used for various kinds of data processing, such as organizing, analysing data, calculating, and also presenting data in the form of graphs or diagrams. The function of Microsoft Excel is to carry out a form of data calculation operation and also present the data in tabular form (Basuki, 2020).

3. RESEARCH METHODS

The type of research used is Research & Development (R&D) with the ADDIE development model. The stages of the ADDIE model are Analyse, Design, Develop, Implement, and Evaluate.

The data collection techniques used were observation techniques, questionnaires, and interviews. Meanwhile, the data analysis used is: (a) observation and interview techniques carried out during initial observations are analysed using descriptive techniques; (b) questionnaires in the form of questionnaires were analysed using percentage techniques. This research focuses on user satisfaction and ease in using the information system for processing student learning outcomes reports so that the instrument used for this research is testing the usability aspect. In the usability aspect, testing uses an evaluation sheet in the form of a questionnaire which is distributed to respondents directly after trying the information system. The questionnaire used is the USE Questionnaire by Lund (2001) which has four criteria, namely usefulness, ease of use, ease of learning, and satisfaction. Questionnaire Testing usability aspects use Likert scale quantitative data analysis. The Likert scale contained in the USE Questionnaire instrument can use a scale of five. According to Sugiyono (2009), the answers to each instrument that uses a Likert scale have gradations from very positive to negative. The value 1 is the smallest one while the value 5 is the largest one. The following formula is used as in (Sugiyono, 2009)

$$\text{Percentage (\%)} = \frac{\text{Total Score}}{\text{Maximal Score}} \times 100\%$$

Information:

Total value = total value obtained from the respondent's answers

Maximum value = number of statements x number of respondents x 5

After getting the calculation results, the values obtained are then converted into qualitative values in the assessment percentage table. Before knowing the assessment percentage table, first look for the Likert scale assessment distance interval using the following formula.

$$\begin{aligned} \text{Interval} &= 100/\text{Total Score (Likert)} \\ &= 100/5 \\ &= 20 \end{aligned}$$



From the interval calculation, it can be seen that the results of the distance interval for the assessment percentage table are 20, so the assessment percentage can be seen in Table 1 below.

Table 1. Percentage of Assessment

No	Percentage of achievement	Interpretation
1	0% - 19.99%	Very Not Good
2	20% - 39.99%	Not good
3	40% - 59.99%	Enough
4	60% - 79.99%	Good
5	80% - 100%	Very good

4. RESULTS AND DISCUSSION

The Process and Stages of the Student Learning Result Report Information System at SMK Negeri 1 Tinambung consists of 5 (five) stages, namely:

First Stage: Analyze (Needs Analysis)

Namely, the initial stage carried out observations in the field (SMK Negeri 1 Tinambung) which consists of two parts, namely: (a) System Requirements: the initial step taken is by analyzing functional needs which is carried out directly, either through the interview and observation stages. The target object in this process is the class teacher at the Tinambung 1 Vocational School. (b) Hardware and Software Requirements: to be able to run the system you need hardware, including a computer/laptop, mouse, keyboard, and printer. Meanwhile, the software includes: Operating System: Windows, and Application: Microsoft Excel.

Second Stage: Design (Design/Designing)

At the design stage, the process carried out in creating the system is designing the user interface design. The following is the storyboard or display format on the screen of the application design for information system development for student learning outcomes reports presented in Table 2 as follows.

Table 2. Report card application design storyboard

Scenes	Picture	Information
1		Login Id Page
2		Dashboard page, the page that appears after successful login.
3		The page that appears after clicking "School Data" on the dashboard contains school information



4		<p>The page that appears after clicking "Student Data" on the dashboard contains a display for inputting student biodata</p>
5		<p>The page that appears after clicking "Student Biodata" contains student biodata</p>
6		<p>The page that appears after clicking "Report" on the dashboard, this display is the report card cover</p>
7		<p>The value input form displays a form for inputting values</p>
8		<p>The value database page displays which display all the data that has been entered in the value input form</p>
9		<p>Display the grades page which displays information on all course grades</p>
10		<p>Display the back page of the report card containing information on street vendors, extracurricular activities, and student absences.</p>
11		<p>Display the description page which contains a description of the student's character development.</p>



Third Stage: Develop (Development)

The student learning outcomes report information system application was developed by utilizing the Developer Menu Tab in the Microsoft Excel Tab. There are 2 (two) development stages as shown in Table 3 as follows.

Table 3. Display of Login ID, Dashboard, Input

Part	Picture	Information
		Login ID Page Display
		Dashboard / Main Menu Display
		Biodata Input Display
		Value input page

Fourth Stage: Implement (Implementation)

The software created and developed will then go through the implementation stage. This stage aims to test the product on users. Several process stages contained in the implementation stage including socialization of product use, product testing, and product use testing.

Fifth Stage: Evaluate Stage (Evaluation)

At the evaluation stage, the software will be evaluated by carrying out 2 stages, namely product revision and product implementation. This stage will evaluate any criticism and suggestions from active users who have used the software and make improvements and improvements to the software during the usage trial process.

Data analysis

Testing in this research focused on testing the usability aspect. The test uses the USE Questionnaire proposed by Lund (2001) which consists of 30 statement items which are divided into 4 aspects, namely the usefulness aspect, the ease-of-use aspect, the ease of learning aspect, and the satisfaction aspect. Test data is presented in the following tables.



Table 4. Data Results for Usefulness Aspects

No	Respondents	Statement Number								Total	Max
		1	2	3	4	5	6	7	8		
1	Respondent 1	5	5	4	4	4	5	5	5	37	40
2	Respondent 2	5	4	5	4	5	4	5	5	37	40
3	Respondent 3	4	4	4	4	4	4	4	4	32	40
4	Respondent 4	4	4	5	3	4	4	5	5	34	40
5	Respondent 5	5	5	5	4	4	5	4	4	36	40
6	Respondent 6	4	4	5	3	4	4	4	4	32	40
7	Respondent 7	5	5	5	4	4	5	4	5	37	40
8	Respondent 8	4	4	4	4	5	5	5	5	36	40
Amount										281	320
Percentage (%)										87.81	

Table 5. Ease of Use Aspect Data Results

No	Respondents	Statement Number											Total	Max
		9	10	11	12	13	14	15	16	17	18	19		
1	Respondent 1	4	4	4	4	4	4	4	4	3	4	4	43	55
2	Respondent 2	5	4	4	4	5	4	4	4	3	4	4	45	55
3	Respondent 3	5	5	4	5	5	5	4	4	3	5	4	49	55
4	Respondent 4	5	5	4	4	5	5	4	4	3	5	5	49	55
5	Respondent 5	5	4	5	4	5	4	5	4	3	5	4	48	55
6	Respondent 6	5	5	4	4	5	5	4	4	3	4	4	47	55
7	Respondent 7	5	5	4	4	4	4	4	4	3	4	4	45	55
8	Respondent 8	5	4	4	4	4	4	4	4	3	4	5	45	55
Amount												371	440	
Percentage (%)												84.32		

Table 6. Data Results for the Ease of Learning Aspect

No	Respondents	Statement Number				Total	Max
		20	21	22	23		
1	Respondent 1	5	4	4	4	17	20
2	Respondent 2	4	5	4	3	16	20
3	Respondent 3	4	4	4	3	15	20
4	Respondent 4	4	5	4	5	18	20
5	Respondent 5	4	4	4	4	16	20
6	Respondent 6	5	4	5	5	19	20
7	Respondent 7	4	4	5	5	16	20
8	Respondent 8	4	4	3	4	15	20
Amount						132	160
Percentage (%)						82.50	



Table 7. Aspect Data Results Satisfaction

No	Respondent's Name	Statement Number							Total	Max
		24	25	26	27	28	29	30		
1	Respondent 1	5	5	4	4	4	4	4	30	35
2	Respondent 2	5	4	4	4	5	4	4	30	35
3	Respondent 3	4	4	3	3	4	3	4	28	35
4	Respondent 4	4	4	4	4	3	4	4	31	35
5	Respondent 5	4	4	4	4	4	4	4	28	35
6	Respondent 6	4	4	4	4	4	4	4	32	35
7	Respondent 7	4	4	4	4	5	4	4	30	35
8	Respondent 8	4	5	4	5	4	4	4	32	35
Amount									240	280
Percentage (%)									86.07	

The four tables are collected and accumulated so that they will produce a summary of the usability testing of the student learning outcomes processing information system with a total score which can be seen in Table 8 below.

Table 8. Accumulated Data Results of Usability Test Results

No	Aspect	Mark	Percentage	Category
1	Usefulness Aspect	281	87.81%	Very good
2	Ease Of Use Aspect	371	84.32%	Very good
3	Ease Of Learning Aspect	132	82.50%	Very good
4	Satisfaction Aspect	241	86.07%	Very good
Total Score		1025	85.42%	Very good

The Usefulness aspect received a score of 281 with a percentage of 87.81%, so it can be said that the development of a desktop-based student learning outcomes report information system at SMK Negeri 1 Tinambung has a usability value with very good criteria. The Ease of Use and Use of Learning aspects respectively received a score of 371 and 132 with percentages of 84.31% and 82.50%, so it can be concluded that the development of a desktop-based student learning outcomes report information system at SMK Negeri 1 Tinambung is easy to implement. to use and also easy to learn. The Satisfaction aspect obtained a score of 240 with a percentage of 85.71% indicating that users are satisfied with the software developed. From this data, it can be seen that the total score for these four aspects is 1025 with a percentage of 85.41%, and it can be concluded that the desktop-based student learning outcomes report information system at SMK Negeri 1 Tinambung meets usability standards in the "very good" category.

5. CONCLUSION AND SUGGESTIONS

From the results of the discussion explained, it can be concluded that the desktop-based information system for reporting student learning outcomes at SMK Negeri 1 Tinambung that was developed is said to be efficient based on usability testing. Based on the conclusions, the author suggests developing a desktop-based student learning outcomes report information system for SMK Negeri 1 Tinambung if it can be developed even better.



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