

Designing Website-Based E-Learning Application on SMP Kusuma Bangsa Using Framework Codeigniter

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Abstract

The Covid-19 pandemic currently occurring around the world, including Indonesia has had an impact and changes in various areas of daily life. Especially, in the field of education which during the Covid-19 pandemic must make efforts to adapt. Minimizing direct interactions is an important first step to avoiding the spread of covid-19. This is also applied to teaching and learning activities between teachers and students therefore teaching and learning activities are carried out online. Without any doubt, this change creates problems and difficulties in the delivery of material, interactions between teachers and students, etc. However, SMP Kusuma Bangsa is a private school that still implements face-to-face learning system. To solve this problem, the author propose making an online learning system. In order to achieve this, the author intend to create an e-learning application. This e-learning application is based on website created using the Codeigniter framework. To find out the application requirements desired by the user, the author make user needs which will be used as a form of analysis in making e-learning application. After getting the results of user needs, the author complete the e-learning application with 3 user models, admin, teacher, and students, each of them has their own function. Likert scale is used to measure the level of user satisfaction of the e-learning application. Based on the results of the calculation, it can be seen that users as respondents who strongly agree with the statement that the e-learning application are in the good category, it shows the acquisition of 84.1%. Therefore, the e-learning application has helped minimize direct interaction, the application operates well, and the presence of an online exam feature, a conference system using the zoom application, etc make teaching and learning activities at SMP Kusuma Bangsa easier.

I. INTRODUCTION

In the midst of the covid-19 pandemic, human activities are limited. Humans are now restricted from interacting directly with each other, this has made significant changes in all aspects of life. As is known from the existing problems, it is necessary to have an appropriate solution to facilitate all human activities. Technology is an answer to this problem. Application is a software (software) that is made to serve several needs for activities such as commercial systems, community service games, advertising, or all processes that are almost done by humans[1]. Applications are applied tools that function specifically and are integrated according to their own[2]. Applications can be divided into two, namely as follows:

1. Specialized software applications are programs with bundled documentation designed to perform a number of specific tasks.
2. A package application is a program with bundled documentation designed for specific types of problems.

From the above understanding, it can be concluded that the application is a computer program designed to work on and make it easier to carry out tasks.

Technology is no longer a strange thing to hear about to help life. It takes the right technology to be able to solve existing problems. The technology that is currently developing is better than before, usually technology developed in the form of hardware, now software, is experiencing the same thing. The rapid development of technology makes

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humans continue to innovate in various fields, one of which is education. The system is a series of two or more interconnected components, which interact to achieve a goal. Most systems consist of smaller subsystems that support larger systems[3].

SMP Kusuma Bangsa is an educational unit having its address at Jalan Aster IV Perum Bumi Indah Tahap 1, Kecamatan Pasar Kemis, Tangerang, Banten. In the current teaching process, it is still using traditional methods and has not implemented the maximum possible use of information technology. Where the meeting of students and educators is only at the same time and right to carry out the learning process. The interaction between students and educators occurs directly. Giving learning materials and homework assignments only at the same time and place. Online learning applications or commonly known as e-learning in the world of education are not new anymore. By creating a website-based e-learning application, it is hoped that in the future it can help the teaching process to be more efficient.

II. METHODS

In this study, to build an online learning system or e-learning. By using the PHP programming language that uses a framework. Framework is a basic conceptual structure used to solve a problem or complex issues[4], such as saving development time with the library structure provided by the framework, there is no need to think about these things, by using a framework, our work will have a standard structure, communities that are ready to help if there are problems and a collection of best practices for a framework is a collection of tested best practices so that we can improve the quality of our code.

The framework used in this research is CodeIgniter. Codeigniter is a php framework that is open source and uses the HMVC method which can make it easier for developers or programmers to create web applications without having to create them from scratch[5]. Advantages Free (Open-Source) CodeIgniter has a license under Apache / BSD open-source so it's free, Having a small hosting server, with a small hosting server is a distinct advantage when compared to other frameworks that are large in size and require large resources and are also in the process as well as storage and Using the MVC method.

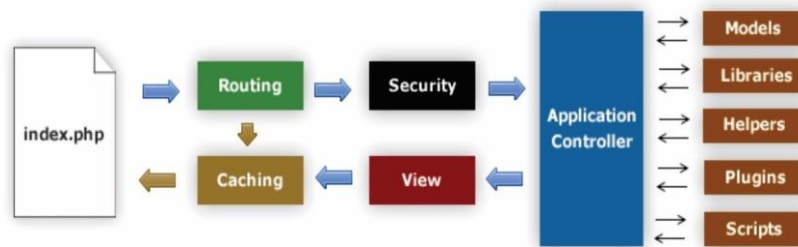


Fig1. CodeIgniter Workflow

CodeIgniter is an MVC (Model-View-Controller) method that allows separation between the program logic layer and the user interface. With this concept, PHP code, Mysql, Javascript and CSS queries can be separated from each other so that the file size and lines of code are smaller and easier to repair due to separate folders. MVC is a method in CodeIgniter that separates application logic from presentation. MVC separates the parts of the application folder based on its components, such as: data manipulation, controllers, and user interfaces. Models represent data structures. The function of the model itself is to connect the program with the database, the view itself is responsible for displaying the program interface sent to the browser and the controller is a bridge between the model and the view.

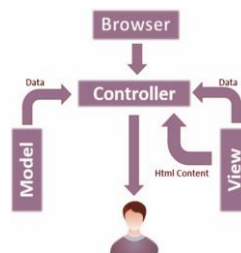
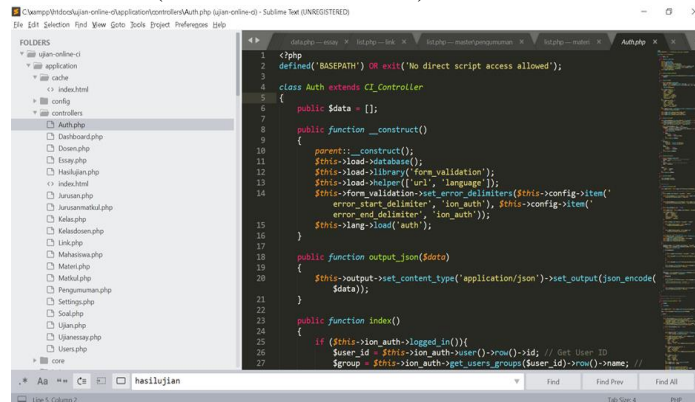


Fig2. Model Controller and View Illustrations

III. RESULTS

In this study using the CodeIgniter framework with the MVC (Model-View-Controller) method, where an example of the application of the MVC (Model-View-Controller) method can be seen in Fig3.Auth Login.php.



```
1 <?php
2 defined('BASEPATH') OR exit('No direct script access allowed');
3
4 class Auth extends CI_Controller
5 {
6     public $data = [];
7
8     public function __construct()
9     {
10         parent::__construct();
11         $this->load->database();
12         $this->load->library('form_validation');
13         $this->load->helper(['url', 'language']);
14         $this->form_validation->set_error_delimiters($this->config->item('
15             error_start_delimiter', 'ion_auth'), $this->config->item(
16             'error_end_delimiter', 'ion_auth'));
17         $this->lang->load('auth');
18     }
19
20     public function output_json($data)
21     {
22         $this->output->set_content_type('application/json')->set_output(json_encode(
23             $data));
24     }
25
26     public function index()
27     {
28         if ($this->ion_auth->logged_in()){
29             $user_id = $this->ion_auth->user()->row()->id; // get user ID
30             $group = $this->ion_auth->get_users_groups($user_id)->row()->name; //
```

Fig3. Auth Login.php

In the Auth.php controller file in this file we will take the public check_login function to enter the program Dashboard.

After logging in, the dashboard.php controller file displays the main menu according to each user. And to display the menu will open the public function index () file.

To describe the business processes on the new system the author uses the UseCase diagram. The following is a depiction of the new UseCase system diagram.

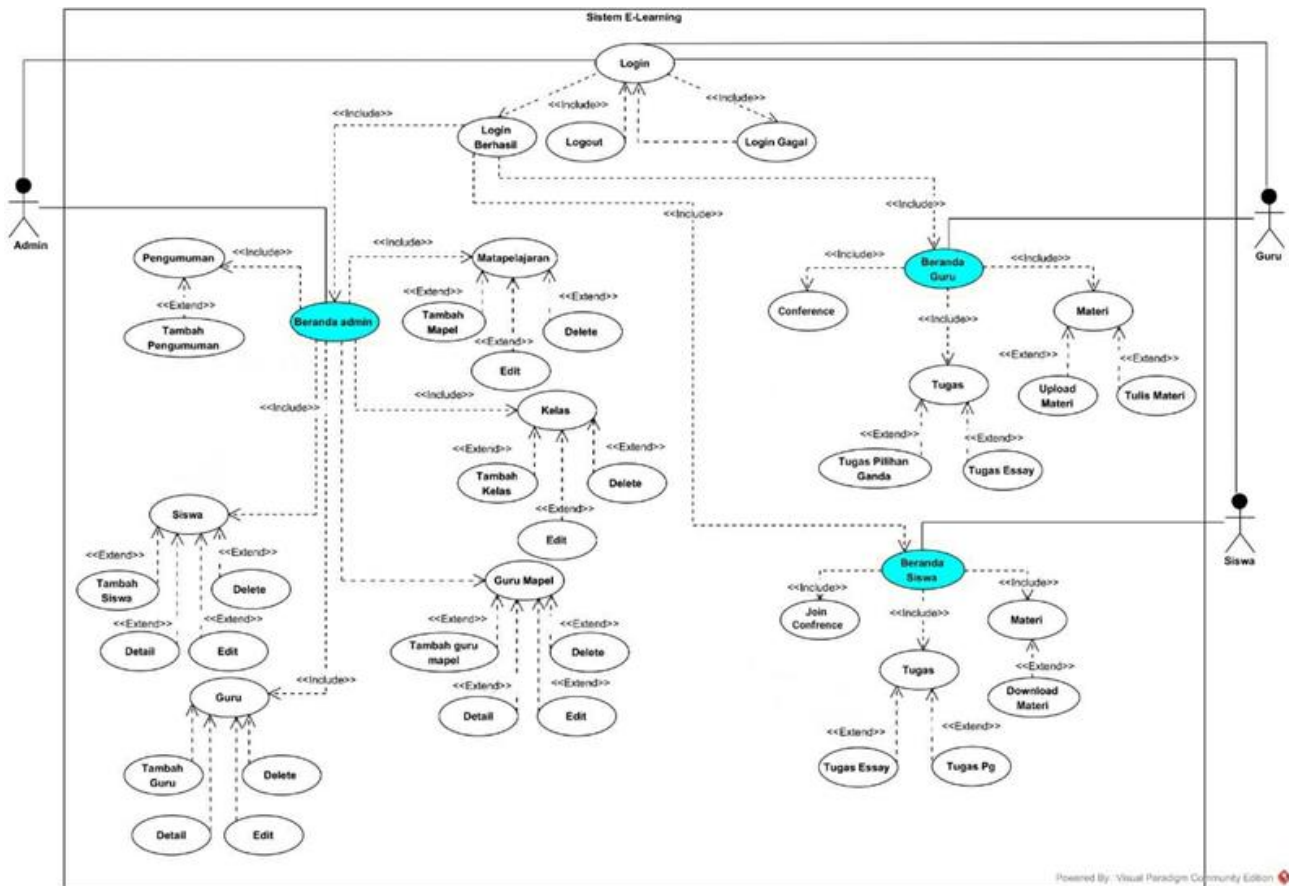


Fig4. New Process UseCase

There are three actors in the new system business process, namely admin, students and teachers. Of the three actors have the ability to access different systems. For admin actors, after successfully logging in, the main admin

page will appear (admin homepage), on the admin homepage there is an announcement menu where admin can provide information via the announcement menu and the admin can also add, view details, change and delete announcements. After that there is a conference menu where the conference menu is used to determine the conference to be held for each lesson schedule. Furthermore, there is a student menu on the student menu, the admin can collect student data such as adding students if it is in the new school year, seeing student details, changing student data if a student has passed or so on and deleting student data. Furthermore, the teacher menu where the teacher menu is used for processing teacher data such as adding teachers, viewing teacher details, changing teacher data and deleting teacher data. Furthermore, there is a class menu where the class menu is used to process class data such as adding classes, viewing class data details, changing class data and deleting class data. Furthermore, the course menu on this menu the admin can process subject data such as adding courses, viewing detailed course data, changing course data and deleting course data. Furthermore, the teacher training menu where the teacher training menu is used to determine certain teachers to teach certain subjects so that there are no clashes between teachers and teaching schedules on this menu the admin can process teacher scheduling data and lesson schedules such as adding teacher data and lesson schedules, seeing detailed teacher data and lesson schedules, change teacher data and lesson schedules and delete teacher data and lesson schedules.

After the student actor has successfully logged in, the main student page will appear (student homepage), the student homepage will display a notification of assignments and announcements. After that there is a conference menu where the conference menu is used to hold a conference according to the predetermined schedule of lessons. Furthermore, there is an assignment menu on the assignment menu, students can do the tasks that have been registered, on the assignment menu there are also 2 types of assignments, namely essay assignments and multiple choice assignments. Furthermore, the material menu where this material menu is used to download learning material according to a predetermined lesson schedule.

The last actor is the teacher, if successfully logged in, the teacher's main page will appear (teacher's homepage), the teacher's homepage will display an announcement. After that there is a conference menu where the conference menu is used to hold conferences with class students according to a predetermined lesson schedule. Furthermore, there is an assignment menu on this assignment menu, the teacher can assign assignments to students, on the assignment menu there are also 2 types of assignments, namely essay assignments and multiple choice assignments, on the assignments menu the teacher can also make corrections to assignments that have been given to students. Furthermore, the material menu where this material menu is used by the teacher to upload course material.

Here are some examples of how the SMP Kusuma e-learning program look like.

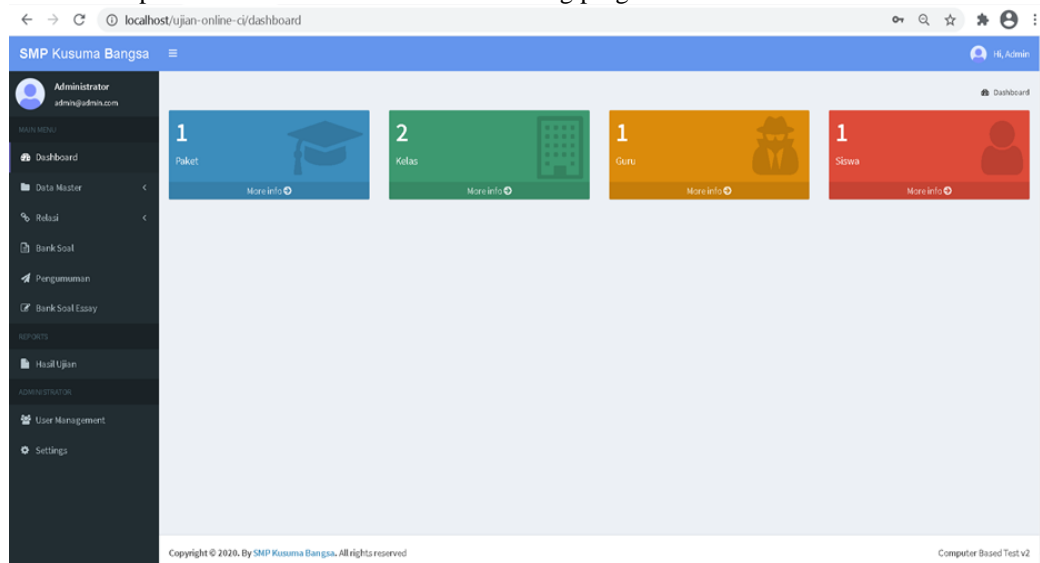


Fig5. Admin Dashboard Page Views

On the Admin Dashboard page on the left side, there is a master data menu in which there is data package master, students, teachers, classes and lessons. Then there is the relationship menu, question bank, announcements, test results, user management and settings. On the Dashboard there is a display package, the number of classes, the number of teachers and the number of students.

IV. CONCLUSIONS

To find out whether the application that has been made shows good results, the authors make a questionnaire with 10 questions for 20 respondents in the research evaluation questionnaire, and a more definite measurement method will be carried out using a Likert scale. The Likert scale is a method for non-comparative measurement used to measure the attitudes, opinions and perceptions of a person or group of people about social phenomena[6]. In the Likert scale the answer score is determined, which is as follows:

Table1 Likert Scale Answer Score

Skala Jawaban	Nilai
Sangat Tidak Setuju	20
Tidak Setuju	40
Biasa Saja	60
Setuju	80
Sangat Setuju	100

In using the ideal score (criteria) will use the formula.

$$\text{Skor Ideal} = \text{Nilai Skala Jawaban} \times \text{Jumlah Responden}$$

Here is the ideal score obtained.

Table2 Shoes Ideal Scale Likert

Skala Jawaban	Nilai	Responden	Skor Ideal
Sangat Tidak Setuju (STJ)	20	20	400
Tidak Setuju (TJ)	40	20	800
Biasa Saja (BS)	60	20	1200
Setuju (S)	80	20	1600
Sangat Setuju (SS)	100	20	2000

The percentage of approval will use the Rating Scale to find out the results of the questionnaire data. The following is the rating scale that will be used.

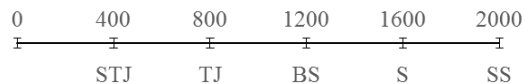


Fig6. Rating Scale on Likert Scale

To calculate the percentage of respondents' answers using the following formula.

$$P = \frac{\text{Total Skor}}{\text{Skor ideal}} \times 100\%$$

Question 1: Is the e-learning app working well?

Table3 Percentage of Approval Question 1

Is the e-learning app working well?			
Skala Jawaban	Nilai	Frekuensi Jawaban	Hasil
STJ	20	0	0
TJ	40	0	0
BS	60	0	0
S	80	11	880
SS	100	9	900
Total			1780
Persentase			89%

Rating scale on question 1:

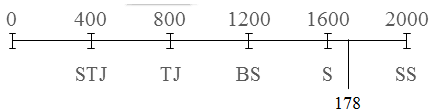


Fig7. Rating Scale Question 1

Question 2: Easy to use e-learning application?

Table4 Percentage of Approval Question 2

Easy to use e-learning application?			
Skala Jawaban	Nilai	Frekuensi Jawaban	Hasil
STJ	20	0	0
TJ	40	0	0
BS	60	0	0
S	80	10	800
SS	100	10	100
Total			1800
Persentase			90%

Rating scale on question 2:

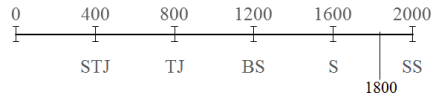


Fig8. Rating Scale Question 2

Question 3: E-learning application helps learning and teaching activities?

Table5 Percentage of Approval Question 3

E-learning application helps learning and teaching activities?			
Skala Jawaban	Nilai	Frekuensi Jawaban	Hasil
STJ	20	0	0
TJ	40	0	0
BS	60	5	300
S	80	10	800
SS	100	5	500
Total			1600
Persentase			80%

Rating scale on question 3:

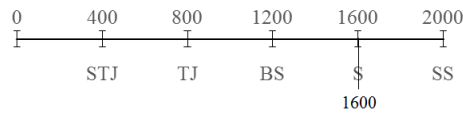


Fig9. Rating Scale Question 3

Question 4: The menu on the e-learning application is complete?

Table6 Percentage of Approval Question 4

The menu on the e-learning application is complete?			
Skala Jawaban	Nilai	Frekuensi Jawaban	Hasil
STJ	20	0	0
TJ	40	0	0
BS	60	0	0
S	80	14	1120
SS	100	6	600
Total			1720
Persentase			86%

Rating scale on question 4:

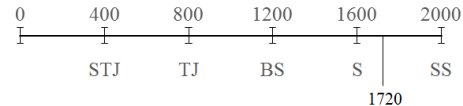


Fig10. Rating Scale Question 4

Question 5: The menu on the e-learning application is easy to understand?

Table7 Percentage of Approval Questions 5

The menu on the e-learning application is easy to understand?			
Skala Jawaban	Nilai	Frekuensi Jawaban	Hasil
STJ	20	0	0
TJ	40	0	0

BS	60	0	0
S	80	11	880
SS	100	9	900
Total			1780
Persentase			89%

Rating scale on question 5:

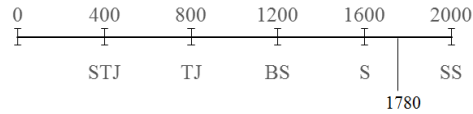


Fig11. Rating Scale Question 5

Question 6: Is the online exam feature in the e-learning application useful in teaching and learning activities?

Table8 Percentage of Approval Question 6

Is the online exam feature in the e-learning application useful in teaching and learning activities?			
Skala Jawaban	Nilai	Frekuensi Jawaban	Hasil
STJ	20	0	0
TJ	40	0	0
BS	60	3	180
S	80	11	880
SS	100	6	600
Total			1660
Persentase			83%

Rating scale on question 6:

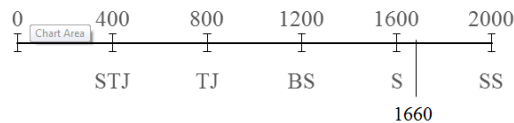


Fig12. Rating Scale Question 6

Question 7: Does the use of the download / upload material feature provide efficiency in the teaching and learning process?

Table9 Percentage of Approval Question 7

Does the use of the download / upload material feature provide efficiency in the teaching and learning process?			
Skala Jawaban	Nilai	Frekuensi Jawaban	Hasil
STJ	20	0	0
TJ	40	0	0
BS	60	2	120
S	80	11	880
SS	100	7	700
Total			1700
Persentase			85%

Rating scale on question 7:

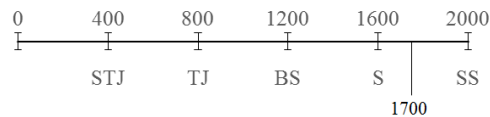


Fig13. Rating Scale Question 7

Question 8: The online assignment feature helps in teaching and learning activities?

Table10 Percentage of Approval Question 8

The online assignment feature helps in teaching and learning activities?			
Skala Jawaban	Nilai	Frekuensi Jawaban	Hasil
STJ	20	0	0
TJ	40	0	0
BS	60	3	180
S	80	13	1040
SS	100	4	400
Total			1620

Persentase	81%
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Rating scale on question 8:

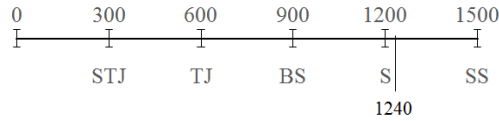


Fig14. Rating Scale Question 8

Question 9: The menu on the e-learning application still needs to be developed?

Table11 Percentage of Approval Questions 9

The menu on the e-learning application still needs to be developed?			
Skala Jawaban	Nilai	Frekuensi Jawaban	Hasil
STJ	20	0	0
TJ	40	0	0
BS	60	4	240
S	80	10	800
SS	100	6	600
Total			1640
Persentase			82%

Rating scale on question 9:

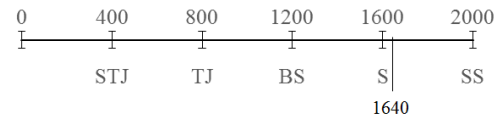


Fig15. Rating Scale Question 9

Question 10: Does the e-learning application present an attractive design?

Table12 Percentage of Approval Question 10

Does the e-learning application present an attractive design?			
Skala Jawaban	Nilai	Frekuensi Jawaban	Hasil
STJ	20	0	0
TJ	40	2	80
BS	60	4	240
S	80	10	800
SS	100	4	400
Total			1520
Persentase			76%

Rating scale on question 10:

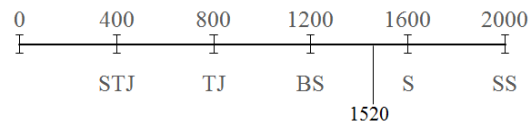


Fig16. Rating Scale Question 10

Of the 10 questions contained in the research evaluation questionnaire, the percentage of agreement was obtained with the result that each question has a value above or equal to 75% and the total satisfaction as a whole.

$$\begin{aligned}
 \text{Total Kepuasan} &= \frac{(1780 + 1800 + 1600 + 1720 + 1780 + 1660 + 1700 + 1620 + 1620 + 1640)}{10} \\
 &= 1682
 \end{aligned}$$

The overall total satisfaction is 1682 or equivalent to 84.1% of the ideal score and is described in the rating scale.

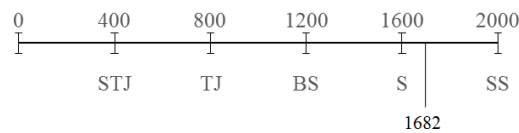


Fig17. Total Satisfaction Scale Rating

Based on Figure 17 which is in the Strongly Agree (SS) area, then the results of the data processing above show that an average of 84.1% of respondents strongly agree that the application made is good.

V. CONCLUSIONS

Based on the results of research carried out in making this e-learning application, and has been conveyed in previous chapters, it can be concluded that the website-based e-learning application at SMP Kusuma Bangsa can help minimize direct interaction in the learning process, the e-learning application. Learning can run well, the existence of an online exam feature as well as writing essay and multiple choice assignments and uploading and downloading material features can simplify the learning process.

In carrying out this research it is hoped that it can run well and correctly, as for suggestions from the author so that this research can be better in the future such as applications can be developed in terms of appearance to make it much more attractive, making features in the form of absences that can be done in e-learning regularly. directly in order to make it easier for users and create a feature for student grade reports for each subject.

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