DESIGNING COMPUTER-BASED SUMMATIVE TEST
FOR THE ELEVENTH GRADE STUDENTS

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Abstract: This study aimed at designing Computer-Based Summative Test software as a tool to support English Test. To make sure that the learning objectives are fulfilled, the testing materials should be in line with the curriculum and learners' needs. This study was attempted to design reading testing software based on teachers' and students' needs. The software was designed because it can solve the testing problems. In this research, the researcher uses ADDIE approach where the participants are the teachers and the eleventh grade students of SMA Sentosa Pemangkat. This study found that students' summative tests need a new testing system which can randomize test items and fasten test result publishing. The result showed that the software can be used by the teacher and students as a software to test students' reading achievement in summative test. The researcher suggests that the teachers use this software to help them in testing.
Keywords: Computer-Based Summative Test, ADDIE Approach

Abstrak: Penelitian ini bertujuan untuk mendesain program Ujian Sumatif berbasis komputer sebagai sebuah perangkat untuk mendukung Ujian Bahasa Inggris. Untuk memastikan bahwa tujuan pembelajaran dapat tercapai, maka bahan ujian harus sesuai dengan kurikulum dan kebutuhan siswa. Penelitian ini bertujuan untuk merancang program ujian membaca berdasarkan kebutuhan guru dan kebutuhan siswa. Program ini dirancang karena ia bisa menyelesaiakn masalah dalam ujian. Penelitian ini menggunakan pendekatan ADDIE dimana pesertanya adalah guru dan siswa kelas XI di SMA Sentosa Pemangkat. Penelitian ini menemukan bahwa ujian sumatif memerlukan sebuah sistem yang dapat mengacak butir soal dan mempercepat pengumuman hasil ujian. Hasil penelitian ini menunjukkan bahwa program tersebut dapat digunakan oleh guru dan siswa sebagai sebuah program untuk menguji pencapaian kemampuan membaca siswa di ujian sumatif. Peneliti menyarankan agar guru menggunakan program ini untuk membantu mereka dalam ujian.
Kata kunci: Ujian Sumatif Berbasis Computer, Pendekatan ADDIE

Assessing students' achievement in teaching and learning process are the primary duty for all teachers. Assessment represents a particular type of educational assessment which is normally conducted by teachers and designed to serve several educational purposes. Some of them are motivating and directing learning, providing feedbacks to students on their performance, providing feedback on instruction and grading.

A good assessment is an effective and efficient in testing students' achievement. For many teachers assessment simply mean giving tests to students

and assigning them grades. In fact, there are several aspects that should be concerned seriously by the teacher when they administered the test such as fairness aspect in testing. In order to change and increase improvements in the testing, teachers need clear understanding of testing. The teachers should pay attention to the way how to communicate the expectations to their students, how they prepare their exams, and how to administer their exams.

A test, in simple terms, is a method of measuring a person's ability, knowledge, or performance in a given domain. According to Brown (2005), there are many definition about test. First, a test is a method. It is an instrument-a set of techniques, procedures, or items that requires performance on the part of the test-taker. Second, a test must measure. Some tests measure general ability, while the others focus on very specific competencies or objectives. Third, a test measures an individual's ability, knowledge, or performance. Testers need to understand who the test-takers are. Fourth, testers need to know test-takers previous experience and background. These understanding is used to construct a test which is appropriately matched to test-takers abilities. Fifth, a test measures performance, but the results imply the test-taker's ability, or, to use a concept common in the field of linguistics, competence. Finally, a test measures a given domain. In the case of a proficiency test, even though the actual performance on the test involves only a sampling of skills, that domain is overall proficiency in a language-general competence in all skills of a language. Other tests may have more specific criteria.

In learning English, there are four skills – listening, speaking, reading and writing. Brown (2000) cited that ESL curricula and textbooks around the world tend to focus on one or two of the four skills. In this research, the researcher focus in reading skill because receptive skill is easier to be assessed than productive skill. Reading skill is a receptive skill that teachers simply expect learners to acquire. Reading skill is the most essential skill for success in all educational contexts. Therefore, assessing reading skill should be use the effective method of testing.

Since the use of computers and electronic devices have become popular all around the world, especially in evaluating the language proficiency of English learners, the most precise and available way is through computers and online process. Moreover, with the appearance of technology, computer testing has begun to be widespread and implemented in large scale testing (Higgins, et al., 2005). Such developments in computer technologies have influenced many areas including educational settings such as online learning, testing and assessment. In addition, Noyes and Garland (2008) believe that the benefits of standardized computer-based tests, such as quick and objective results and the ease of comparing results with others make this method very popular.

There are three basic reasons for testing on computer. The first is to enable measurement of constructs or skills that cannot be fully or appropriately captured by paper based. The second is to improve measurement by increasing the precision or efficiency of the measurement process. The third is to make test administration more convenient for examinees, test maker, or both (Educational Testing Service [ETS], 2011).

Based on the researcher's interview in SMA Sentosa Pemangkat, the researcher found that there are several problems which exist continuously in final

test such as human error, examination malpractices, delay in the release of result, and limited budget of printing test materials. All of the aforementioned problems exist in paper and pencil test. These bring about the needs for new innovation of the examination method. Then, the researcher has an initiative to transform the paper and pencil test into computer-based testing which is called Computer-Based Summative Test. The researcher wants to design a software that can be used to solve those problems in testing. The researcher believes, the software will help the teacher in assessing the students and help the teacher collects students' pure score in testing.

The similar research discovered that Computer-Based Testing is an effective solution for mass education solution (Temitayo et al, 2013). Though, a variety of e-assessment approaches and systems have been developed in recent times, yet lack of flexible timing functionality to automatically log-off candidates upon expiration of allotted time, result integrity comprise, stand-alone deployment, lack of flexibility, robustness and scalability as well as human error are major limitation of the existing platforms. In their study, it says a web-based online examination system is developed to address these aforementioned drawbacks. The system is designed to facilitate the examination processes and manage challenges surrounding the conduct of examination, auto-submission, computer monitoring, randomized questions, auto-marking and fast result report.

Based on that explanation, the researcher decided to design a computer-based testing software which is used by the teacher in testing students' achievement, especially summative test. The researcher expects Computer-Based Summative Test (CBST) will help the students to obtain their score and help the teacher to assess students' achievement. Therefore, this research will be conducted for SMA Sentosa Pemangkat, West Borneo as a helpful software to measure students' summative test achievement.

METHODOLOGY

In conducting the research, the researcher used development research. Branch (2009, 2) stated that there are five clinical phases: analysis, design, develop, implementing and evaluation which represent a dynamic, flexible guideline for designing usable product. The research was conducted at SMA Sentosa Pemangkat, Sambas Regency, Indonesia, where the participants were the eleventh grade students and the English teacher.

The researcher used purposive sampling as the strategy in this study. The selected participant were the eleventh students of SMA Sentosa Pemangkat in academic year 2014/2015. There are three classes which consist of two classes of IPS and one class of IPA, 9 students were selected as the sample because these students represent the eleventh grade students. In conducting this research, there are techniques and tools of data collecting.

Techniques of Data Collecting

The researcher used observation and interview in preliminary study. Observation was used to observe the current condition of summative test and the testing delivery system in the testing process. Interview was used to gain the teacher's point of view towards the current testing delivery system.

The direct assessment on the designed software was needed for the evaluation phase. The researcher used direct assessment from the experts to complete the evaluation process.

Tools of Data Collecting

Tools of data collecting in this research were interview guidelines, observation checklist, and assessment rubric. The researcher interviewed the teacher in purpose to obtain the information about the difficulties which he faced in summative test system which was used by the teacher. The observation checklist was prepared to get the teacher's perception on the testing process. The researcher also provided the assessment rubric for the experts to evaluate the computer-based summative test designed by the researcher.

The purpose of the expert evaluation is to find out whether the software designed by the researcher already fulfilled the six components of software aspect development. The expert validation data was analyzed by rating scale. Adapted from Rahayu & Azizah's instrument (Rahayu & Azizah, 2012), rating scale was scored by following formula:

$$K = \frac{F}{N \times I \times R} \times 100\%$$

Where:

  K : Assessment percentage
  N : Higher point in the questionnaire
  I : Number of item
  F : Sum of respondent's answer
  R : Number of respondent

Then the result will be categorized by following criteria.

Table 1
Feasibility Category

Percentage (%)	Criteria
0 – 20	Very poor (Revise)
21 – 40	Poor (revise)
41 – 60	Moderate
61 – 80	Strong
81 – 100	Very Strong

The result of assessment rubric became consideration in revising the software. The expert assessment would help researcher to figure out whether the software was already usable or not.

FINDINGS AND DISCUSSION

Findings

The research was conducted based on ADDIE approach, there are five steps of collecting the data. They are analyzing, designing, developing, implementing, and evaluating.

In analyzing phase, analyzes several aspects such as the curriculum, the testing process, testing material used by the teacher, the students' and the teachers'

perception towards computer-based testing and the school facilities. These aspects needed to be analyzed in order to design the computer based summative test that suitable with the teacher's and students'' needs.

The first aspect was the curriculum. Based on the curriculum, English subject should be taught in the school, and it has instructed that all of the skill should be taught in the classroom. The testing material should be in line with the syllabus. In teaching English subject, teacher relied on one text book which is entitled "*PR Bahasa Inggris*" published by *Intan Pariwara*. The textbook's material was divided into four language skills: listening, reading, writing and speaking. Because the goal of this research was to design computer-based summative test in assessing students' reading skill, the researcher adapted the material from that book. Then, the perception of the student and teacher toward to the computer-based testing software is really important in designing the software later. The teacher and the school acknowledge the research that researcher purposed. Based on the teacher's opinion with the sufficient facilities in the school, computer-based summative test software could help teacher and student in examination.

In designing phase, researcher designed first draft of the test that based on the testing problems. The researcher collected and selected appropriate material, evaluated the selected material, and designs the first draft of the computer testing application. The materials were collected from some sources, such as book, journal and internet. Every information and material that is useful to compose the game will be described in this phase. (*See figure 1*)

In developing phase, researcher developed the first draft into the real Computer-Based Testing software. The adjustment of teacher's need in testing became the fundamental consideration in developing the application. The CBST system was composed of admin login page, student login page, the question upload page, schedule page, examination page, and the test summary page
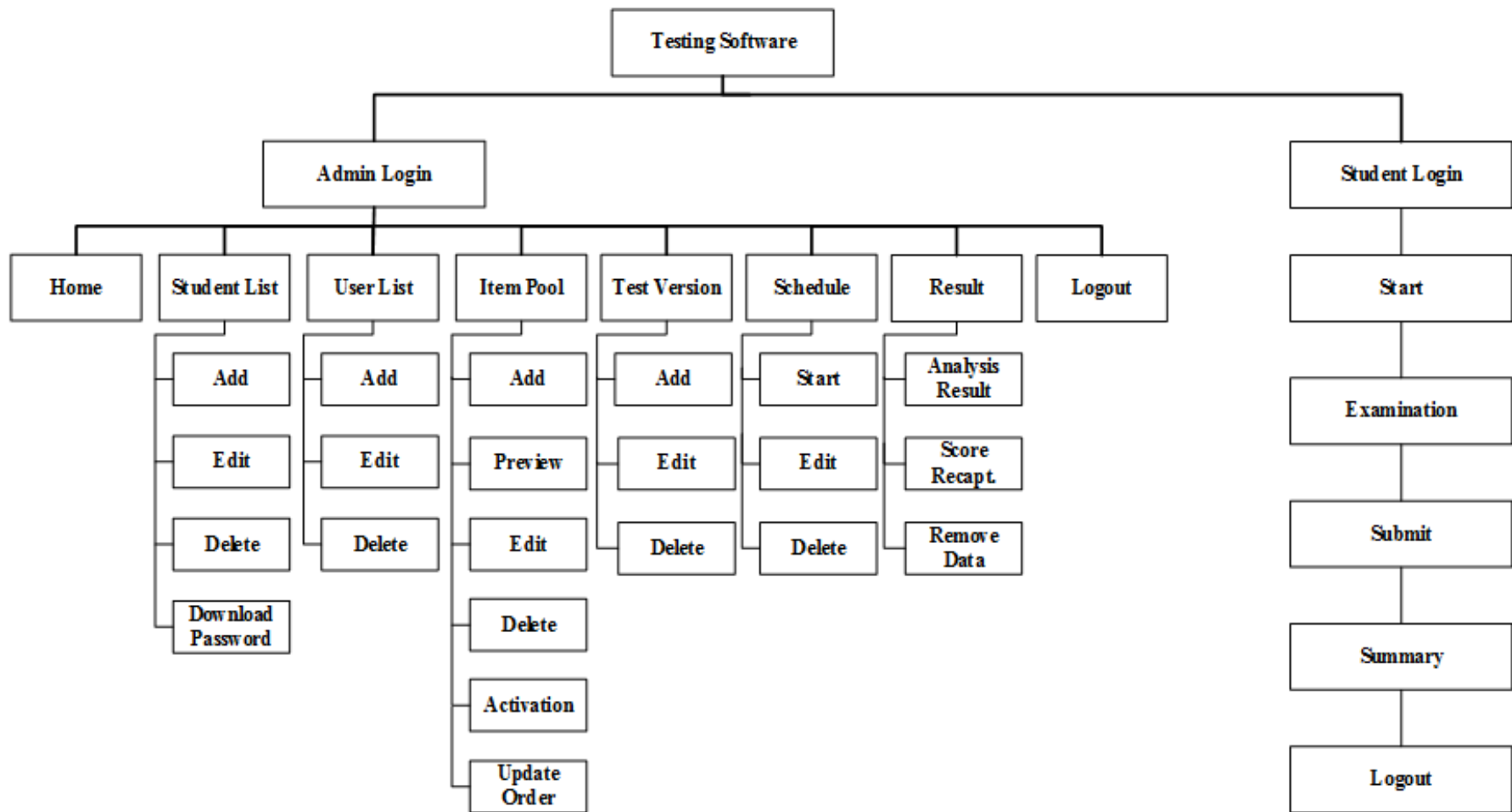
Figure 1. First Draft

1. Admin Login Page

This is the default page of the system. It is also known as the homepage of the system that automatically loads after the URL has been requested for by a web browser on the client system. This page is used by the teacher to login into the system in other to bring out operation such as register students into the system, setting questions, viewing the test summary report and print out the test result.
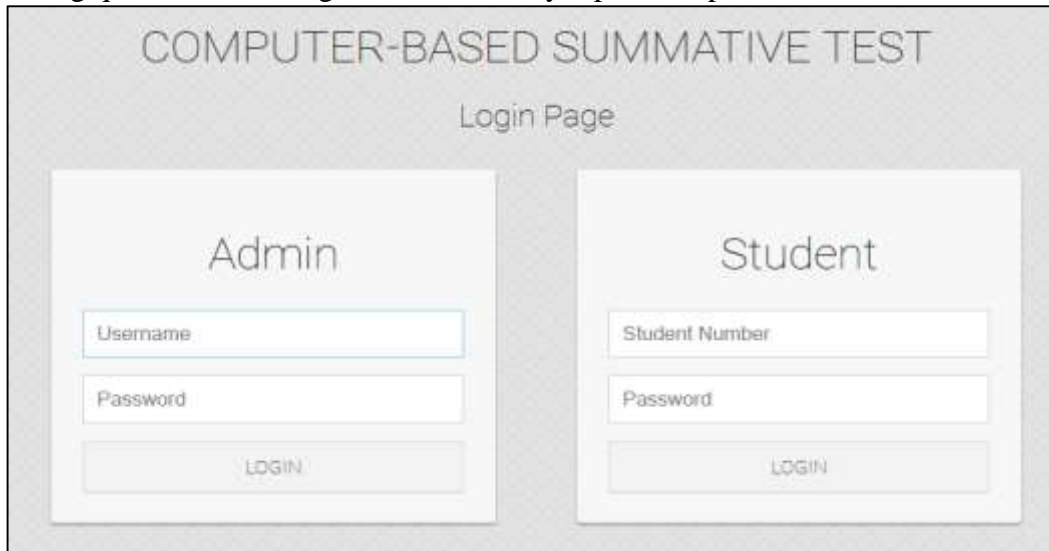

Figure 2. Admin and Student Login Page

2. Student Login Page

This page contains the login section for the students to login the examination page to gain the access to the system. The students login with their students' number and password that is given by the teacher or admin.

3. Question Upload Page

This page is used to administer the questions of the examination to the students. The test item will be stored in the database and it can be serves to the students randomly who can answer the questions by clicking the radio button as the answer.
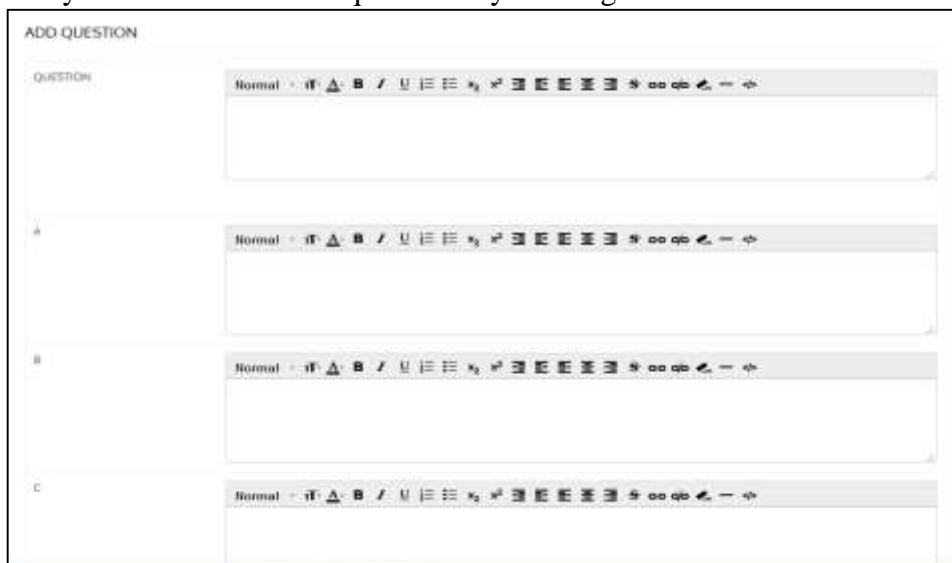

Figure 3. Question Upload Page

4. Schedule Page

In this page, the teacher can control the examination such as set examination duration and monitor students' examination process. The system provided a start button which is used to set the examination into accessible mode.

Figure 4. Schedule Page

5. Examination Page

This page is provided for the students to access the examination. Students can select options by click the radio button as their answer. The time for the examination is ninety minutes. Once the time is over, their answer will be submitted automatically.
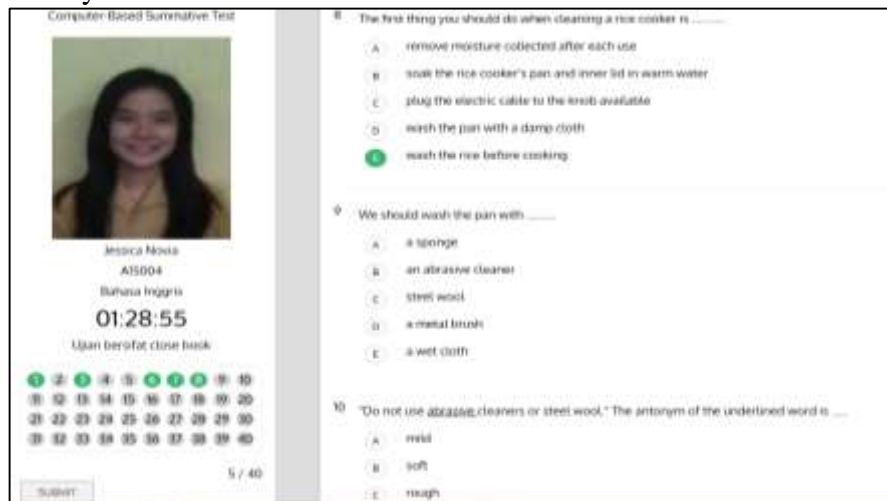

Figure 5. Examination Page

6. Test Summary Page

This page is used to display the result of each students who have taken the examination using the system. The system provided the summary of the test as the test feedback to the students. So, the students know how many item that they have answered and their score in the test summary box.

Figure 6. Test Result Page

In implementing phase, the researcher tried put the software that have been generated in the developed phase. Based on Branch (2009), the purpose of the implementing phase is to prepare the environment and engage the students. The Implement phase indicates the conclusion of development activities and the end of formative evaluation. In this phase, the software designed by the researcher were tried out in English subject. To gain the feedbacks from the students, the researcher used an observation. Based on the observation with collaborators, the students can operated the system which was provided for the examination. Therefore, this software was considered as a usable software that can solve the examination problem which facing the teacher and the students.

In evaluating phase, the researcher used teacher evaluation on the software that have been generated from the develop phase. This software is evaluated by Teddy Fiktorius, M.Pd., an English Teacher.

Table 2
Result of Teacher's Evaluation

No.	Aspect	Score	Item	Average Percentage	Criteria	Category
1.	Usability	29	6	96.67 %	Very Strong	Feasible
2.	Navigation	5	1	100 %	Very Strong	Feasible
3.	Graphic Design	22	5	88 %	Very Strong	Feasible
4.	Compability	5	1	100 %	Very Strong	Feasible
5.	Loading Time	9	2	90 %	Very Strong	Feasible
6.	Functionality	24	5	96 %	Very Strong	Feasible
	Total	94	20	95.11 %	Very Strong	Feasible

Based on the result of the teacher's evaluation above, the overall of teacher's assessment about the application is feasible by average percentage is 95.11%. It means that, this application for language testing is feasible to be use in language testing process.

Discussion

The main purpose of the research was to design computer-based summative test software for assessing English reading skill of the eleventh grade students. The study showed that the designed software was able support the summative test in term of assessment and test delivery. As Temitayo et al (2013) stated, "Computer-Based Test (CBT) System … is an effective solution for mass education solution". The systems is designed to facilitate the examination processes and manage the challenges surrounding the conduct of examination, auto-submission, computer monitoring, randomized questions, auto-marking and fast result report.

In the analyzing phase, the researcher analyzed English subject taught in that school. In testing English subject, all of the testing material were taken from the textbook. In order to support the designed software, the researcher used the material from the book which used by the teacher and the students in the teaching and learning process. Besides that, teacher and the school which the researcher purposed, were optimist and agree this testing software is a helpful software in assessing students' reading skill. As Noyes & Garland (2008), in their study addressed that

effective scoring of computer assessment results in faster feedback and greater accuracy … reduction in human error.

In the designing phase, the researcher collected and selected the appropriate material to help the researcher in designing the software. Researcher uses XAMPP software as the database, notepad ++ as the source code editor, id hostinger as the web hoster, and Mozilla Firefox as the browser to connect the software. Then, the researcher designed a software first draft based on the data from analysis phase and adapted the test item in term of multiple choice questions (MCQ). After that, in the develop phase, the researcher developed the first draft into the real model of the software which will be implemented in that school.

In implementing phase, the researcher tried out the software with English subject test items which were derived from the textbook that used by the teacher. The researcher found that this software could run smoothly and help the teacher in managing test and controlling test. Then, based on the observation, this software is proven that able to fasten students' test in language testing reading skill in summative test. The observation showed the students were able to use the software and the test-takers do not have any significant difficulty in using the software as the testing system in summative test. It means this software is considered as user friendly software.

In the evaluating phase, the product of Computer-Based Summative Test in this research was verified by Teddy Fiktorius, M.Pd., an English Teacher. The product was verified as "feasible" in all aspects with average 95.11 %. This category indicates that the required elements of the designing product was fulfilled. Eventually, the high degree of the feasible indicates that the product is considered as a factual Language Testing application for SMA Sentosa Pemangkat. Finally, for the whole discussion, the study was conducted to answer the research questions. The teacher needs a new system that can utilize the summative test while the students need comfortability and faster test result publishing. The software provided several features to solve the problem such as randomized questions, auto-marking, and faster assessment. In order to make it sure that the software run well, the researcher tried out it and the result is satisfied for the usability of the product.

CONCLUSION AND SUGGESTION
Conclusion

There are five phases conducted in this research: analyzing phase, designing phase, developing phase, implementing phase, and evaluating phase. It was found that: (1) the teacher and the students needed the computer-based summative test software in assessing English reading skill; (2) the students' roles, the teacher' roles and the roles of the instructional media needed to be in line with the principles of testing; (3) based on the evaluation, the software for assessing English reading skill which is named Computer-based Summative Test was proven usable. The use of the computer-based Summative Test software had increased teacher's and students' motivation in testing. It can be seen in the testing delivery system during the examination. Students pay more attention than before, they are more motivated in answering the test item by using the software. It means, this software can be

implemented by the teacher to support the achievement of reading skill in summative test as the effective summative test software.

Suggestion

Based on the conclusion above, the writer would like to provide some constructive suggestions as follows: (1) In using the computer-based summative test software designed by the researcher, teacher needs adjust the English test item into reading skill; (2) The computer-based summative test software test items should be in line with the curriculum of English subject; (3) The computer-based summative test software designed by the researcher are only recommended to test English reading skill, it's not for the other skills.

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