

DEVELOPING PORTABLE WEB-BASED TESTING SYSTEM TO OPTIMIZE STUDENTS' TESTING RESULT

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ABSTRACT

One of the ways in measuring the students' competence in mastering certain skill or knowledge is by using test. Unfortunately, the result of the test especially that using multiple choice tests does not represent the students' real competence due to cheating habit, sleepy supervisors, inconsistency of testing time, and others. He then develops portable web-based testing system with the goal to measure the students' real competence and to minimize those weaknesses. To run the system, it needs no certain place such as computer laboratory because the teacher only needs two main tools that is his own laptop as server and the access point to communicate the server and the students' laptop as users. The features I like most are randomization and time limitation. After running the system, the teacher just need to wait the result appears in his monitor and there is no paper needed in this process.

Keywords: portable, web-based test, system

1 INTRODUCTION

In teaching learning process, one of the ways in measuring the rate of successfulness in it is by conducting assessment. From the writer's observation in Purworejo Muhammadiyah University, he found that the dominant way in measuring the students' competencies in mastering certain knowledge or skill is by using test. Actually, there are a lot of methods in measuring the students' competencies such as portfolio, making report papers, interview, and scientific projects. From the interview with those high lecturers, most of them tend to have test because it is easy to handle, it has been programmed by the university in mid test and final test, and it is the fastest way to get score. From the interview also, he knew that those lecturers are frequently have paper and pen test (the writer calls it as manual test) rather than computerized or online test. They said that it is better because they can handle it by themselves. Furthermore, the writer sees that those lecturers are educated with the test they have since they go to formal education.

Knowing that the dominant way in measuring the students' competency is by using test, the writer then did a further observation during mid and final test in Purworejo Muhammadiyah University. From those observations, he found some weaknesses in conducting mid and final test. First, the students tend to do cheating in various ways from seeing their friends' work, copying the materials, until asking search engine (e.g. Google) to help them answering the questions. Second, the supervisors whose job to handle and to make sure the test run well were frequently got sleepy and some of them went out of the class to chat with other supervisors. Moreover, some supervisors did other activities while waiting for the test such as playing their smartphones or correcting the students' tasks. Third, the writer found that the students still do the test even the test time end, means that it has inconsistency of testing time. As

the effect, the test atmosphere looks chaos and the risks of losing the students' answer sheets are high.

From the problems found above, the writer then develop testing program which are able to minimize students' chance to cheat, able to minimize the role of the supervisors, able to set the testing time, and able to minimize the testing cost. Furthermore, the writer has to think to beyond the limitation of time and place such as in conventional test. From the research, he develops the program which he calls as portable web-based testing system. The goal is measure the real competence of the students and to ease the lecturer and the students in doing the test.

2 METHODS

A. Literatur Review

The writer did a research to get a portable web-based testing system and he takes some literature related which can be seen below:

1. Test

According to Brown (2003: 3), test is a method of measuring a persons' ability, knowledge or performance in a given domain. Moreover, Arikunto (2013:53) defines that test is a procedure or instrument used to determine or measure something in the case, by the ways and the rules that have been determined. Kaner (2003:1) states that test is a sequence of one or more subtests executed as a sequence because the outcome and/or final state of one subtest is the input and/or initial state of the next. The word 'test' is used to include subtests, tests proper, and test suites. So, test means a sequence of instrument prepared to measure person's ability, knowledge or performance in a given domain.

The focus of the research is to measure the students' competencies through multiple choice tests because most of the lecturers who teach in the early year of the study uses this kind of test. Zimmaro (2004: 11) says that multiple-choice items can be used to measure knowledge outcomes and various types of learning outcomes. They are most widely used for measuring knowledge, comprehension, and application outcomes. The multiple-choice item provides the most useful format for measuring achievement at various levels of learning.

2. ICT

Related to the developing of web-based testing system, it is close to the use of Information Communication Technology (ICT). Mikre (2011) says that ICT refers to the computer and internet connections used to handle and communicate information for learning purpose. Freeman and Hasnaoui (2010: 3) say that ICT is a field of work and study that includes technologies such as desktop and laptop computers, software, peripherals, and connections to the Internet that are intended to fulfill information processing and communications functions. Furthermore, UNESCO (2002) states that ICT is the combination of informatics technology with other, related technologies, specifically communication technology. So, it can be said that ICT is a technology based which connects many devices through internet to fulfill information processing and communications functions.

The use of ICT is not only limited on one area but nowadays, it is a multi-dimensional area including almost all area in all sector of life.

Related to education, ICT is also used by individuals for a multitude of purposes including education (Buseti, et al., 2007; UNESCO, 2002), daily living (Richardson, 2009), and social networking (Rose, 2007). In this case, the writer wants to take part in using ICT in education area by developing portable web-based testing system. Hopefully, it can be one step ahead to measure the students' competency effectively, accurately, and efficiently.

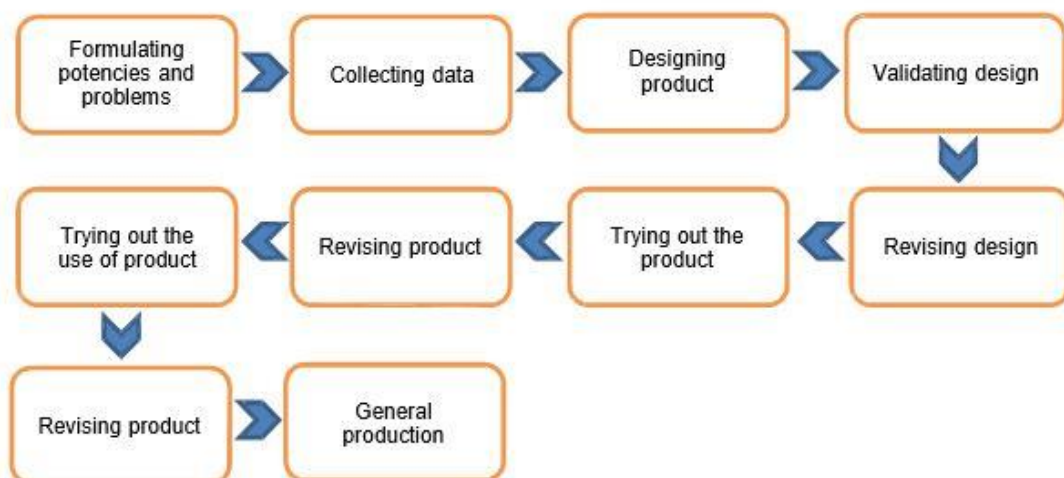
3. Web-based Test

Sessink, et all (2004) says that web-based test refers to a situation in which a student accesses questions and submits answers by a web browser and in which the exam results (partially or completely) determine the final grade for the subject. Romero, et.al. (2008:436) define that A WBT is a computer-based test delivered via the Internet and written in HTML language (Hyper-Text Markup Language) and possibly enhanced by scripts. Furthermore, Yu, et.al. (2003:112) state that web-based testing system employs web-interface that people are familiar with and it is easy to operate so that people can easily learn to use the system.

In the research, the writer develops portable web-based testing system. It means that he uses all benefits of web-based test but the system can be run with no limitation of time and space. That the writer found in Purworejo Muhammadiyah University and some other higher institutions, it seems that those institutions have one or two rooms known as multimedia room or computer laboratory. If the teacher wants to run the testing system using CBT, it will be chaos. But, by applying portable web-based testing system, the teacher might conduct his test in classroom even in the school park.

B. Research Method

In conducting the research, the writer uses research and development method as proposed by Sugiyono (2012:409). It starts from formulating potency and problems, collecting data, designing product, validating design, trying out the product, revising product, trying out the use of product, revising product, and general production. The basic scheme of the research and development is as follows:



3 RESULT

A. System structure

The structure of the system is not complex enough. It starts from the local server (the lecturer's laptop) which being able to access the questions bank, and then it is delivered to the users (students' laptop) through wireless access network (WAN) which uses access point (AP) as the communicator. After the students access the test (login, do the test), the result of it will be directly sent to the server through access point and both lecturer and the students can see the result of the test directly or real time.

The system structure of the portable web-based testing system can be seen below:

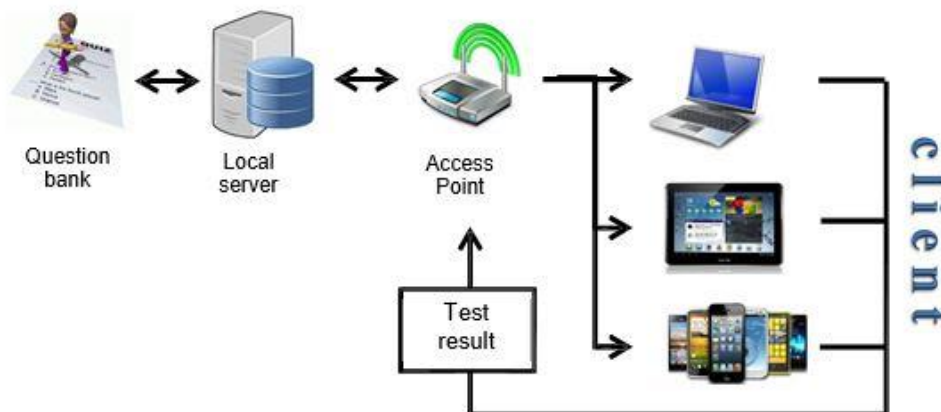


Figure 1. The structure of portable web-based testing system

B. Features of the system

1. Login

To log into the system, the user should register as the student or as the teacher. The students have access to do the test, to see their own score, etc. and the teacher have full access to the system. They can set the test time, number of questions appears, etc.

2. Question bank

The teacher has to make the questions in the table available and then store it in question banks. When he wants to test it to the students, he just need to choose which questions will appear to the students' monitor.

3. Inserting media

One of the advantages of the system is inserting media. There are various media can be inserted to the questions appear such as picture and audio.

4. Time controlling

The teacher can manage or set the time of the test. There are two types of the testing time namely time based (the teacher sets the time e.g. 45 minutes) and period time (the teacher sets it based on o'clock e.g. 08.00 – 08.45 AM).

5. Auto correction

The type of questions available in this system is multiple choices, so the writer puts auto correction that is the computer will check the students' answer directly and put out the score of the test real time. So, it is efficient in time.

6. Monitoring

The teacher can monitor the students through his laptop so that he knows how many students have finished the test, their test score, their time in doing the test, which questions answered correct and wrong, etc.

7. User level

There are two user levels in this system that is the teacher as administrator and the students as user.

C. Research Findings

1. Tryout part 1

In running the system, the teacher can do it well because the writer has made the guiding book. The students cannot see their friends' job due to the random question and the time limitation to do the test. Some comments of the students say that the audio is not really clear and it is heard not so fluently.

Observing the way of tryout part 1, there are some obstacles faced. The first is about electricity. Some of the students got their laptop battery low so that we need to provide electric plug in. The second is about supporting devices (access point). The lecturers have used a high specs laptop but the access point cannot handle the 35 users at the same time so that some students are hard to log in. The solution is by changing the access point with a higher spec of it. The third is the computer virus in the students' laptop. It is difficult because it really annoying them to do the test. The solution is by reinstalling their laptops.

2. Tryout part 2

In tryout part 2, it run well because the problems appear in tryout part 1 are already solved. The students and the lecturers are familiar with the system, the quality of audio is fine, the score transparency, there is no lag in log in or in loading the media, and there is no students got annoyed by the virus. In general, it runs well.

3. The questionnaire

To know the rate of effectiveness of the system, the writer made two questionnaires for the students and for the lecturers. The results of the questionnaires are as follows:

a. The students' questionnaire

From the questionnaire, it is known that most of the students love to have web-based test than paper based test because it is user friendly, they can know the result directly, there is a transparency of score and it can measure their real competence in certain domain.

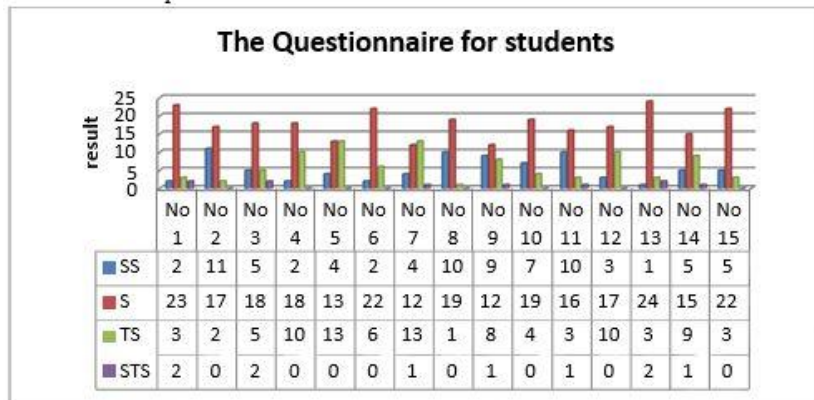


Figure 2. The result of questionnaire for students

b. The teacher’s questionnaire

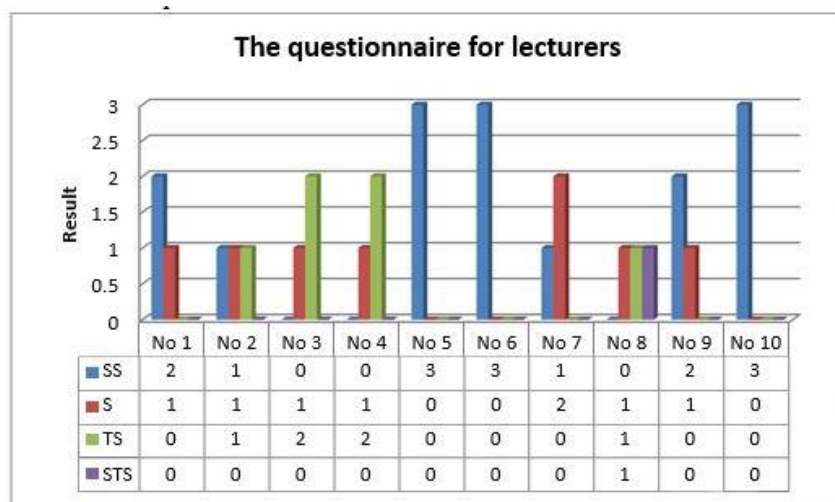


Figure 3. The result of questionnaire for lecturers

The result of the questionnaire for lecturers shows that they feel that the system helps them so much especially with the feature auto correction. However, they think that this system is suitable for multiple choice only and the domain can be measured is limited on knowledge and comprehension only. The difficulties faced by the lecturers are transferring the questions from the printed mode into electronic mode.

4 DISCUSSION

A. The impact of the system

From the questionnaire, there are some significant impacts in using the testing system and those are as follows:

1. The auto correction helps the lecturers so much in correcting and in scoring the students’ test result. They do not need to do manual correction and they just need to input the score into the academic system when the test finished.
2. It changes the lecturer’s way of testing his students. When a lecturer wants to test his students using multiple choice tests, this system is applicable. It is because the

lecturers can set the number of questions appeared, the test time, and the questions are randomly appeared so that it reduces the chance of the students to cheat.

3. It changes the atmosphere of the test. The existence of the portable web-based testing system makes a big difference in atmosphere of test. From the observation during the test time, the writer saw that there is almost no students do cheating, the supervisor or the lecturer can have relax time or he can do some other things such as making article, there is no risk of losing paper sheet, the supervisor does not need to remind the students about the testing time because there is a timer on the screen, the score can be seen real time, and there is no paper needed to do the test because all data are stored digitally. It gives benefits to lecturer and the students themselves.

B. The Benefits of The System

The benefits of a portable web-based testing system are 1) it is portable, means it can be run with no limitation of space and time, 2) No paper needed, means that it is cheap for a long term test, 3) the quality of media (visual and audio) is high, means that the students can see a clear, colored picture and they can also get a good quality of audio and they can use their own headset, 4) time efficiency in correcting and in scoring because it is automatic, 5) no internet connection needed because it is a wireless access based, 6) the use of minimum devices because it only needs two main devices (teacher's laptop and access point), 7) the low role of supervisors because the system has handled the whole process of the test.

C. The weaknesses of the system

Beside the benefits, there are some weaknesses of the system and those are 1) electricity becomes the main problem because with no electricity the test cannot run, 2) the formula (*equation editor*) cannot be inserted, 3) the media in the form of video cannot be inputted due to limitation of the devices, 4) the students can do the test using laptop only, we will develop it so that the students can do the test using their smart phone, 5) the limitation of the users can access the test at the same time.

5 CONCLUSIONS

A. Conclusions

1. This portable web-based testing system can maximize the atmosphere of the test such as measuring real competence of the students, reducing the students' chance to cheat, maximizing the quality of the media inserted, and reducing the cost of the test.
2. At the moment, this system can be applied for multiple choice test only and the students can use their laptop only to do the test, later we will develop the system more.
3. In running the system, the lecturer can do it well because it is user friendly and the students have no difficulties in taking the test using this system. There are a lot of benefits can be taken by applying this system rather than manual testing system.

B. Suggestions

1. The lecturer/teacher has to use the development of IT in conducting teaching learning process in general and in measuring the students' competence in specific because it has a lot of advantages compared to manual method.
2. To increase the quality of test, it is suggested for the teacher to change into CBT or web-based testing system because it helps the teacher so much.
3. The students should learn better to face the test so that they will get the best result.
4. If the students want to do the test using web-based system, it is suggested to prepare their devices early so that they will have no obstacle in the test.

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Then, as the wise-word says "there is nothing perfect" and so does this paper. He welcomed to those who want to have critics, comments and advice related to the paper. However, the writer expects that it will give some contributions to assessment especially related to test.

REFERENCES

- Arikunto, Suharsimi. (2013). *Prosedur Penelitian: Suatu Pendekatan Praktik*. Jakarta: Rineka Cipta.
- Brown, H.D. (2003). *Teaching by Principles: An Interactive Approach to Language Pedagogy, Second Edition*. New York: Longman.
- Busetti E., Dettori, G. Forcheri, P., and Ierardi, M.G. (2007). A pedagogical approach to the design of learning objects for complex domains. *Journal of Distance Education Technologies*, 5(2), 1-17.
- Freeman, Ina and Amir Hasnaoui. (2010). *Information and Communication Technologies (ICT): A Tool to Implement and Drive Corporate Social Responsibility (CSR)*. La Rochelle, France: HAL Id: hal-00495968; <https://hal.archives-ouvertes.fr/hal-00495968>.
- Kaner, Cem. (2003). *What is a Good Test Case?* Florida: Florida Institute of Technology
- Mikre, Fisseha. (2011). *The Roles of Information Communication Technologies in Education Review Article with Emphasis to the Computer and Internet*. Ethiopia Journal of Education & Sc. Vol. 6 no. 2. 11 July 2011

- Richardson, H.J. (2009). A 'smart house' is not a home: The domestication of ICTs. *Information Systems Frontiers*, 11(5), 599-608.
- Romero, Cristobal, et.al. (2008). Using Mobile and Web-Based Computerized Tests to Evaluate University Students. *Wiley Periodicals, Inc.*
- Rose, M. (2007). The transmission of culture in a globalized world: The challenge of new technologies. *Canadian Issues*, Winter 2007, 55-57.
- Sessink, Olivier, et all. (2004). *Securing Web-based Exam*. Journal of Universal Computer Science, vol. 10, no. 2 (2004), 145-157
- Sugiyono. (2012). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta
- UNESCO. (2002). *Information and communication technology in education*. Accessed 10October 2016 from <http://unesdoc.unesco.org/images/0012/001295/129538e.pdf>.
- Yu, Yuan-Lung, et.al. (2003). *Development of a Web-based Online Examination System*. Department of Computer Science and Information Management, Hung-Kuang University
- Zimmaro, Dawn M. (2004). *Writing Good Multiple-Choice Exams*. DIIA: The University of Texas at Austin