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Implementation of national examination based on Computer Based Test at Vocational School 1 North Sangatta

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Abstract

This research aims to describe national examination based on CBT methods that looked at human resources, infrastructures, students, strategies, and national examination weakness based on CBT implementation at Vocational School 1 North Sangatta. This research is a descriptive study with a qualitative approach. Data collection techniques can be done through observation, interviews, questionnaires, and documentation. This research was conducted at Vocational School 1 North Sangatta. The results show that: (1) national examination based on Computer Based Test implementation methods clearly: preparation step, planning step and the implementation step. (2) the weakness of national study based on Computer Based Test implementation methods are technique and non-technique problems. This problem is solved by (a) increase electricity supply, (b) hold and repair hardware of computer which not suitable with qualifications, (c) register for the remedial test. Non-technique problems are solved by training the students to prepare for the national examination.

Keywords: implementation CBT, computer based test, national examination

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1. Introduction

The national exam is an activity to measure graduates' competency standards in certain subjects nationally by referring to the competency standards of graduates. (BNSP, 2017). Thus, the national exam is a form of educational evaluation activities on student learning outcomes in certain subjects determined by the government. The national exam is also an educational evaluation tool for mapping education quality problems to formulating national education policies.

The organizer of the national exam is the National Education Standards Agency. In the 2014/2015 school year, a new policy related to implementing the national exam, namely the national exam, can be implemented in 2 (two) ways. First, the national exam is carried out in writing or Paper Based Test (PBT). Second, the national exam is carrying out using a computer-based mechanism known as the Computer Based Test (CBT). (Mcclelland & Cuevas, 2020; Nurhayati & Rislana, 2020; E. N. Onah et al., 2020; Van Groen, 2020; Yao, 2020). The difference between the two ways of implementing the national exam lies only in the technical aspects of implementation, including duplication and distribution of national exam questions by the government and students' processing of national exam questions. (Lin et al., 2020; Martin, 2020)

The government has not formally established the new policy in administering computer-based national exams to implement it in junior and senior secondary education units. However, the computer-based national exam implementation in 2017 is still in the testing phase as in the previous year. Therefore, the performance of computer-based national exams in 2017 is only limited to registered schools. It's was emphasize by the Head of the Education Assessment Center at the Research and Development Agency of the Ministry of Education and Culture that the CBT national exam is only carrying out in schools that register for both junior and senior high schools.

Adequate infrastructure is needed to hold the 2017 CBT national exam. The quantity of space used, the availability of electricity supply, and the need for computer equipment needed. (González-Gómez & Jeong, 2019; B. I. Onah et al., 2020) Readiness teachers and students also need the smooth implementation of the CBT national exam in 2017. (Barokah et al., 2020; Martha et al., 2020) Because this can affect students' mentality in facing the 2017 CBT national exam built by holding several CBT national exam tryouts in schools. The competence for accompanying teachers must also be prepared, both mentally and from the competencies that must be possessed. This readiness includes knowledge and expertise as well as competencies regarding related activities. Supervisory teachers or assistants who have expertise or competence in computer problems will be appointed as technicians in the implementation of computer-based national exams or CBT national exams in 2017.

The problems described should have been prepared carefully for schools that want to hold the 2017 CBT national exam. Thus, in implementing the 2017 CBT national exam, it can overcome the obstacles that occur, especially on infrastructure feasibility availability of computers and their eligibility, the availability of the used exam room. In this study, researchers took the place of research at SMK Negeri 1 Sangatta Utara. Because the school held the CBT national exam for the first time in 2017. Researchers wanted to know more about the process of implementing the 2017 computer-based national exam at Vocational school 1 North Sangatta. Based on the background of the problem and the limitations of the question above, the problem can formulate: how is implementing the computer-based national exam or Computer Based Test (CBT) at Vocational school 1 North Sangatta?

2. Methods

This research is descriptive research with qualitative approach. In this study, researchers want to reveal the phenomena, conditions, patterns, events that occur and used iare n the implementation of computer-based national examination in Vocational school 1 North Sangatta, East Kutai Regency. The result of this research is in the form of narrative sentences as the result of data analysis from interview, passive participative observation and documentation study.

The participants of this study were five people from Vocational School 1 North Sangatta. Sampling aims to select teachers from schools that carry out computer-based national exams to provide a particular perspective on the phenomenon under study.(Robinson, 2014; Smith et al., 2009). Five teachers were interviewed to assess how they carried out the preparation for the computer-based national exam. Interview data were analyzed using constant comparative analysis. The first step in the continuous comparison method is to reduce excess data (Kolb, 2012). Data reduced through selection, simplification, abstraction, and transformation of the collected raw data (Kolb, 2012). The next step is data reduction by coding.

Three phases of coding carried: (a) open coding, (b) axial coding, and (c) selective coding. Open coding refers to the initial conceptualization of data. Each row of data collected was studied to determine its meaning in terms of concepts related to the study and the Code being developed (Corbin & Strauss, 2014). Open coding involves data comparison and explicit filtering of obscure information; the TAG code of relevant information determines the categories that appear (Corbin & Strauss, 2014). The next stage is the data merging. It's is where related categories seem to be recorded and grouped (Kolb, 2012). Subcategories can be further determined through this phase (Corbin & Strauss, 2014). The final stage involves identifying and selecting core categories, and these core categories are systematically linked to related core categories. The core themes and their relationship to each other are connected to each research question (Hewitt-Taylor, 2001). From this theme emerged, the researcher developed an analytic theme following this research's objectives and problem formulations.

In this research the validity test data used by researchers is by triangulation. Triangulation is a technique of checking the validity of data that utilizes something else. (Carlson, 2010; Denzin, 2012). Triangulation consists of three triangulation techniques, namely triangulation of data sources, triangulation of data collection techniques, and triangulation time of data collection. Triangulation technique is to check the data obtained to the field using three different methods of interview, observation and documentation. (Denzin, 2012). Data obtained from interviews were compared with observational data and document study results. In this case, the data obtained from the Proctor of Vocational school 1 North Sangatta. Besides, triangulation techniques also use the type of source triangulation. Data obtained from one informant will be confirmed to another informant who is also involved in implementing a computer-based national exam. This study data obtained from the Proctor of Vocational school 1 North Sangatta compared and searched more in-depth by interviews Principal, Chairman of the National Exam Committee, Teachers and Students Vocational school 1 North Sangatta.

3. Results

After the researchers conducted data collection, reduce data research results, organize data, and verification of research data, in this sub-chapter will be presented data research results. The presentation of research data is divided into three groups: national computer-based exam policy of 2017; implementation of the computer-based national exam at Vocational School 1 North Sangatta and barriers in the performance of computer-based national exam in Vocational School 1 North Sangatta.

3.1. Computer Based National Examination Policy 2017

Change or repair of national exam related to its implementation. Appears the computer-based national exam introduction in 2015 based on the National Standard Agency Regulation No. 0031/P/BNSP/III/2015 on Standard Operational Procedures of National Examination Exam Year 2014/2015. So the implementation of the national exam in the academic year 2014/2015 can be done in 2 ways, namely the Paper Based Test (PBT) and Computer Based Test (CBT). However, implementing CBT in 2015 is still in the pilot phase, and its implementation is only for pioneer schools or pilots. The policy on implementing the CBT continues until 2017 and is devoted to schools enrolling and passing the verification requirements.

The background of the implementation of the computer-based national exam or Computer Based Test (CBT) in 2017 is to provide innovation in the performance of national examinations, especially in Vocational School 1 North Sangatta and the implementation process is more reliable, fast and efficient, and to minimize the need fees incurred for national exam activities such as those conducted on the PBT national exam or write. From the cost of making the package problem and the package of national exam questions, the fee required to prepare the computer answer sheet, and the charge of distributing the national exam questions. Furthermore, based on the results of the study, documentation of the benefits of the national examination of CBT is presented on the national policy change exam policy, i.e.:

- Improve the quality, flexibility, and reliability of national examinations
- Streamlining the national exam procurement process.
- Faster and more detailed results to students, parents, and schools.

Implementing a computer-based national exam or computer-based test (CBT) has its advantages compared to the conventional or conventional national exam called the Paper Based Test (PBT). The benefits or advantages of CBT compared with the PBT are: 1) management in the process of preparing questions more quickly and efficiently involved personnel such as in the process of printing and distribution of the national examination; 2) a cost-saving process of laying student answer sheets and can be used on an ongoing basis by using a computer; and 3) the processing of student work result is relatively faster.

3.2. Implementation of National Computer-Based Exam at Vocational School 1 North Sangatta

The implementation process here is several stages. Based on the result of document study from BSNP Regulation No. 0043 / P / BSNP / I / 2017 on Standard Operational Procedure of National Exam Examination Year 2016/2017, description of stages of implementation of the computer-based national exam or UN CBT there are 3, namely preparation stage, management stage and implementation phase.

1. Preparation phase

In the preparation stage, there are several activities are undertaken, among others: 1) socialization of CBT, 2) school data collection, (3) infrastructure verification, 4) establishment of school organizer, 5) determination of CBT schedule.

2. Stage Management

There are several aspects to be done in the management phase. Among others include personnel, facilities and infrastructure, students, and the CBT system. A detailed explanation as follows:

1) CBT Personnel Management at Vocational School 1 North Sangatta
   Activities undertaken in CBT personnel management include planning, recruitment, placement or assignment, and training. CBT personnel planning process done at the CBT organizing school is Vocational School 1 North Sangatta about planning the determination of proctor and technician by the Principal. The term proctor is a person determined to be the responsible and implementer of CBT activities. Proctor is a person who served as proctor assist in the implementation of CBT.
2) Management of Facilities and Infrastructure CBT at Vocational School 1 North Sangatta
   In the management of facilities and infrastructure of a computer-based national examination, some activities include planning, procurement, and distribution. Activities undertaken in planning facilities and infrastructure CBT here are the fulfillment of the criteria of infrastructure requirements CBT by the school. Fulfillment of infrastructure requirements criteria is one of the references in computer-based national exam CBT.
3) Implementation Student Management CBT in Vocational School 1 North Sangatta
   The student management process conducted here is an activity that includes: planning, placement, and coaching. The registration process of CBT participants is done by listing the students of Vocational School 1 North Sangatta and attached to the Form of Skills CBT 2017 in the implementation of the national exam CBT is using a computer, so all that is done all systemic than the process of data recovery students from Education Department to the school has added Username and Password students. For the students to enter into the national exam CBT system using the name in question and detected by the central server.
4) Management of CBT System
   The CBT system management process is carried out by the proctor and assisted by technicians. Proctor does prepare the CBT system on the school server computer. Based on observations made on the statement of repeated or repeated illustrations, manipulation of conditions of CBT system preparation mechanism done with the following stages:

   - Setting up a server computer with virtual BOX application installs.
   - Creation of Virtual Machine can run its operation on the server computer.
   - Open and run an application called CBT Sync.
   - Enter the school's server ID to enable the server to the central server.
   - Synchronize to the central server.

   For a client computer (participant) system set up as follows:

   - Setting up a client computer with Google Chrome Browser app installs.
   - LAN and port cabling to connect to server computer local school.

After setting up the CBT system and setting up the client computer (participant), the next step is the synchronization process. The synchronization process is the process of connecting a local school computer server with a central computer. Because in the process of synchronization is its usefulness related to; 1) activating the school server, 2) downloading process, 3) TOKEN release, and 4) uploading process of the participants' work to the central server.

3. Implementation Phase

Based on a document study result from BNSP Regulation No. 0043 / P / BNSP / I / 2017 on Standard Operational Procedure of National Exam Completion in 2016/2017. The implementation stage here is two activities undertaken: Implementation of Pre Exam and Implementation of Official CBT. Based on the results of observation of the re-implementation mechanism of Pre-CBT activities carried out include the following:

- Proctor turns on the local school server computer.
- Proctor is running Virtual Machinedi local school computer server.
- Proctor runs an application called CBT Sync.
- Proctor includes local server ID and a serial number of local school server computer to activate the system.
- Proctor synchronizes the school's local server with a central server for the downloading process.
- Proctor stores synchronization data on school server computers
- Technicians turn on and setting up the client computer in each test room.

The synchronization process has done at the pre-test stage. Data synchronization process results have been stored in the local school server computer at the pre-test stage. So in the implementation of the official CBT only added the release process TOKEN, distribution TOKEN on exam participants, and the execution of work by participants. The use of TOKEN here is temporary because it has timeout or usage time. Because in addition to being temporary use of TOKEN, here is a TOKEN used for all students. Participants are required to enter the username and password given to enter into the CBT system computer client. Besides, the username and password serve to detect student data on the local school server computer. The next step is for the participants to carry out the work on the computer. Questions done by the subjects tested based on a predetermined schedule.

After the participants finished working on the question, the first step is to log out of the client computer system (participants). The next step is to upload the craft of the participants to the central server. Before performing the upload process, the participants' results are stored or backed up on school server computers. And the announcement of the products is made simultaneously with the information of the implementation of the national examination CBT in writing.

3.3. Obstacles in the Implementation of Computer-Based National Exam in Vocational School 1 North Sangatta

During the implementation of CBT in Vocational School 1 North Sangatta, some constraints occur. Five problems occur:

- The occurrence of dead or power outages.
- Lack of space to be used for school server space.
- Computer specifications used on school server computers not following CBT requirements criteria.
- Mental disruption of participants educated for being tested in the implementation of CBT in 2017.
- some participants can not follow CBT officially according to schedule due to illness and must follow follow-up.

To overcome these problems, the Vocational School 1 North Sangatta take the following troubleshooting actions:

- Solving the problem of power outages can be overcome with a backup power supply that can support CBT for 2 hours.
- Conducting procurement and repair on the server computer hardware devices that are less by the criteria requirements.
- Conduct regular coaching by conducting CBT exercises. This CBT exercise is held three times a week to provide one day subject with a time allocation of 3 hours. Its implementation mechanism uses online school instructional media and has explicitly modified tailored to the CBT system's actual state to be utilized later.
- The final problem solving, the participants are registered to take the follow-up examination of CBT, which will hold on April 3rd-6th, 2017. For the implementation mechanism of CBT, Vocational School 1 North Sangatta must perform the procedure on the official implementation of CBT from the beginning. It includes the synchronization process, the release of the TOKEN exam, and uploading work to the central server.

4. Discussion

The central government socializes national computer-based exams through the ministry of education and culture to schools. Socialization through workshops to schools that are used as piloting the implementation of computer-based national exams. (Ula & Nawangsari, 2018) National exams now have new media for implementation, namely through computers; since 2017, computer-based national exams or CBT have begun to be simulated and tested in Indonesia. (Mcclelland & Cuevas, 2020) Computer-based national exams have not yet been Simultaneously implemented in all Indonesian schools. Only schools deemed to have met the CBT implementation standards can hold this computer-based national exam. (Santi & Prajana, 2019)

The standards that must be met by each school to be able to use this national exam system are having a computer that can be used as a national exam media, having a network or stable internet connection, and schools that can take computer-based national exams. (Van Groen, 2020) However, the computer-based national exam did not fully get a positive response. Many responses considered the computer-based national exam to negatively impact, so many pros and cons in the community regarding the computer-based national exam.

The advantage of implementing computer-based national exams is that they are more cost-effective when compared to previous national exams. The costs incurred for administering the national exams-based paper require much higher costs; the costs incurred come from printing questions and distributing questions that cost a lot of money. (Nurhayati & Rislana, 2020; Saptono & Widjasena, 2019). Meanwhile, suppose you use computer-based national exams. In that case, these costs can reduce because the CBT does not require printing questions and distributing questions. These costs can divert for other educational purposes, such as providing scholarships and complete school facilities and infrastructure. (Marsudi, 2020) The national exams that must do simultaneously sometimes experience delays in questions to come to every school throughout Indonesia; because Indonesia is a large and vast country, it is not easy to be able to reach all school locations throughout Indonesia, so often several schools experience There is a delay in receiving national exam questions. In contrast, if you use a

computer-based national exam or CBT, the distribution delay will not occur because it can be accessed directly via a computer simultaneously.

Another advantage of CBT is that it can minimize cheating that occurs during exams. Of course, you are familiar with the various cheats that can happen when exams are carried out, cheating and asking exam roommates answers. However, if you use a computer-based national exam, affairs like that can minimize because everyone's questions are random, making it difficult to ask friends. After all, the problems for each computer have different questions. Because they cannot ask questions or cheat, students must prepare themselves optimally during the examination process. Unlike the usual or conventional national exams where you have to wait to find out the results of your exams, with CBT, you no longer need to wait, because the works when the national exams have complete, you can find out your scores faster because the national exams have based this computer.

In implementing CBT, every school often experiences several obstacles that want to carry out computer-based national exams due to the limited number of computers that are sufficient to carry out computer-based national exams. .(Triwiniastuti & Sabatini, 2019). It is why not all schools in Indonesia can implement CBT, especially if schools located in remote areas of Indonesia, where the internet network is still volatile, making it difficult to follow CBT in every school. Another obstacle is that not all schools have good internet access, so not all schools can take CBT and still take national exams manually.

5. Conclusion and Recommendation

Implementation of the computer-based national exam or Computer Based Test (CBT) in Vocational School 1 North Sangatta consists of several stages as follows:

- The preparation stage includes the socialization activities of CBT, school data collection, infrastructure verification, the school's establishment, and the CBT schedule.
- Management phase undertaken, among others: 1) CBT personnel management covering the planning activities of determining the criteria of proctor and technician, the planning job description of proctor and technician, determination of proctor and technician, organizing or assigning proctor and technician and training proctor and technician, 2) management of computer-based national exam facilities or infrastructure at Vocational School 1 North Sangatta covering planning activities fulfillment of infrastructure requirement criteria, procurement and distribution; 3) control of national computer-based exam student or CBT in Vocational School 1 North Sangatta includes the activities of student enrollment planning, placement and coaching in the form of training, and 4) system management CBT.
- Implementation phase undertaken, among others: 1) implementation of pre-examination, which includes preparation activities of CBT system and the existence of CBT training to learners, 2) implementation of the exam, and 3) processing of student quality.

Obstacles in implementing computer-based national exams or CBT (Computer Based Test) in Vocational School 1 North Sangatta divide into two groups. They are technical and nontechnical obstacles. Technical barriers include, among others, the occurrence of electric or power outages, lack of space to be used for school server space, computer specifications used on school server computers are not by CBT requirements criteria, and some participants can not follow the official CBT on schedule due to sick and must follow up. Nontechnical obstacles are mentally disrupted learners because the material used as a trial in implementing the new CBT held in this academic year 2016/2017. To overcome these problems, the Vocational School 1 North Sangatta take the following troubleshooting actions:

- Troubleshooting on power outages can be overcome with a backup power supply.
- Conducting procurement and repair on the server computer hardware devices that are less by the criteria requirements.
- Conduct regular coaching by conducting CBT exercises.

This CBT exercise is held three times a week to provide one day subject with a time allocation of 3 hours. Its implementation mechanism uses online school instructional media and has explicitly modified tailored to the CBT system's actual state to be utilized later. The last problem solving is that participants are enrolled to follow the CBT follow-up examination held on April 3rd-6th, 2017. The mechanism of CBT implementation following Vocational School 1 North Sangatta must perform the procedure on the official implementation of CBT from the beginning, covering the process of synchronization, the release of the TOKEN exam, and the process of uploading the quality to the central server.

Based on the research conclusions in this closing chapter, the researcher tries to provide the following recommendations:

- To the school should further improve and improve facilities and infrastructure, especially for implementing computer-based national exams.
- To the teacher, better prepare personal maturity to guide students in preparing for computer-based national exams.
- To students, it is better to be more prepared to face the computer-based national exams and not be nervous about following the implementation process.

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