

Define the Scope and Identify Learner Characteristics Computer Based Test (CBT) for Junior High School Students in Makassar

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Abstract-*This research aims to develop computer based test (CBT) application for junior high school students in the city of Makassar in effort to resolve various obstacles in the implementation of Computer-based National Test (UNBK) and as a simulation media of the test implementation for junior high school students. The model of development used was interactive multimedia model and design developed by Stephen M. Alessi and Stanley R. Trollip through steps of planning, design, and development. At the stage planning, there were some steps to conduct, including define the scope and identify learner characteristics. The research subject was junior high school students in Makassar city. Technique of data collection was by using questionnaire, interviews guidelines, and documentation, and then the data was analyzed with qualitative descriptive design. Results of the scope of the Computer Based Test (CBT) application development research was limited to the level of junior high school (SMP) in Makassar, while the identification of user characteristics includes mental characteristics and readiness for using the CBT application. Students at this stage enjoyed experimenting and exploring, and working tendencies in groups, while the readiness is that one hundred percent students were able to use computers and even had internet devices they use every day. In addition, on average students use computers more than thirty minutes a day using mobile devices.*

Keywords: Computer-based test (CBT), Computer-based National Test (UNBK), Junior High School

I. INTRODUCTION

Information and communication technology is increasingly developing and has a great effect on changes in human civilization, including in the field of education. One of the biggest changes in Indonesian education is curriculum change. One of the competencies needed to be able to compete in the 21st century is the ability to use information and telecommunications technology (*digital literacy*). Prensky divides IT literacy skills into two, namely digital natives and digital immigrants (Guo, 2008). Digital natives or the generation of *new millennium learners* (NML) or net generation are humans born in the 1980^s (Kang, 2010). This generation has a learning style that is very much different from the generation of digital immigrants. One of the reasons for the change in learning styles is the easier access to information so that students can learn anytime and anywhere by using technological tools that continue to grow (Nurhikmah, 2011).

The importance of the use of information and communication technology in implementing a better education system is supported by Presidential Instruction Number 6 of 2001, concerning the Development and Utilization of Telematics. The use of technology and information in the world of education is not only used for learning and management of education, but also used as an evaluation tool.

The national exam has been regarded as a measure of the success of schools in educating students and then not infrequently high value targets are the main priority of the school in order to be seen as competent in producing smart graduates. The national examination is an assessment tool that is considered capable of being used as a benchmark for the success of national education, although it is not the only condition that determines student graduation. At the Preparation Coordination Meeting of National Examination and National Standardized Examination on December 22, 2016, clarity was obtained about the policy of organizing national examinations and school examinations for 2017, namely: 1) national exams still carried out, 2) school examinations upgraded to USBN (National Standardized Examination) for some subjects, and 3) expanding the implementation of computer-based, both National Exams and National Standardized Examination. One of the innovations in the implementation of the National Examination since 2014 up to now is the introduction of a Computer Based Test

(CBT) system. CBT is defined as a series of computer-based tests or assessments that either involve stand-alone computers or are connected to internet networks (Jimoh, 2012).

Computer based tests are not new in the field of evaluation and assessment. This system can be found in several types of tests that have applied CBT including English language proficiency tests (TOEFL), Civil servant candidate selection tests, and Teacher Competency Tests. The Computer Based National Examination (UNBK) basically aims to improve efficiency, reliability, integrity, and apply the role of information technology to the national examination system. The implementation of Computer Based National Examination (UNBK) is certainly inseparable from the problem of readiness to fulfill UNBK requirements. Some technical requirements, such as facilities and infrastructure, can be resolved by adding equipment or by assisting competent technicians. Besides that, invisible problems such as students' mental readiness are serious things that need to be trained and directed so that those who initially do the tests conventionally (*paper & pencil test (P & P)*, *paper based tests (PBT)*) can be better prepared when they have to do the tests computer-based. Computer-based tests (CBT) have many advantages compared to conventional test models, especially in the implementation of national exams, in the presentation of the Head of the Center for Education Assessment and Research Center on the 2015 national exam explained the benefits of using them easier, more direct, more credible, various forms, cheaper and more transparent (Nizam, 2015).

The number of schools that have had UNBK infrastructure facilities in Indonesia is 11,103 Junior High School; 9,653 Senior High School; 9,829 Vocational Schools; so that a total of 30,585 schools were ready to implement UNBK in terms of facilities and infrastructure (ubk.kemdikbud.go.id). The quantitative level of junior high school has the highest ratio compared to senior high school and the vocational one. In an effort to overcome various obstacles in the implementation of UNBK, it is necessary to develop a media simulation for the implementation of UNBK for junior high school students. Based on this, the problem in this study is how to develop a computer based test (CBT) application for junior high school students in the city of Makassar?

II. METHOD

This research is a Research and Development (R & D) which aims to develop CBT applications for junior high school students in Makassar city by using an interactive multimedia design and development model developed by Stephen M. Alessi and Stanley R. Trollip, namely through steps of planning, design, and development. In the first stage, planning is carried out which consists of defining the scope and identifying learner characteristic. The research subjects were junior high school students in Makassar city with the consideration that the junior high school level in the city had implemented UNBK, where 63.14% had implemented UNBK in their own schools and the remaining 36.86% had implemented it in other schools. (Data source <http://ubk.kemdikbud.go.id>). Data was collected through documentation, interviews and questionnaires using data collection instruments in the form of documentation, questionnaires, and interview guidelines, which were then analyzed in qualitative descriptive.

III. RESULTS

The results and discussion of this phase of research are limited to the planning stage in accordance with the stages of development of Alessi & Trollip (1991). There are seven activities carried out at the planning stage, two of which are *define the scope* and *identify learner characteristics*.

a. Define the Scope

Based on the results of the needs analysis, the scope of research on the development of Computer Based Test (CBT) was determined, which was limited to the level of Junior High School in Makassar city. The selection of Makassar city as a place for product testing due to several considerations, namely 1) Makassar city is the location of the most UNBK implementers for the South Sulawesi territory with a percentage of 100%. Based on data obtained from <http://ubk.kemdikbud.go.id> that the percentage of UNBK schools is SMP in South Sulawesi Province, especially in Makassar city, almost 100% conducted exams with UNBK, 63.14% of implementing schools and the remaining 36.86% carried out UNBK in other schools, 2) infrastructure that was more adequate compared to district cities, 3) schools and junior high school students in Makassar City are better prepared to use CBT compared to other cities / districts, 4) ease of accommodation and field research because the authors lives in Makassar City.

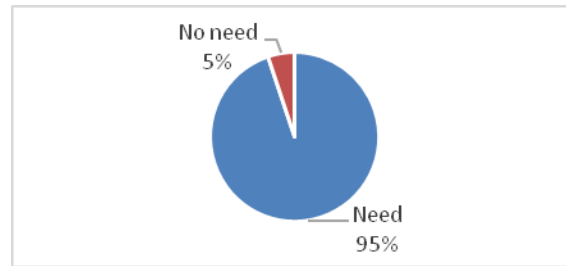


Figure 1.1: Needs of UNBK simulation application

The needs in the field were used as a foundation in the development of CBT applications. So on March 23-25 2017 researchers conducted a needs analysis in several schools in Makassar. Of 371 respondents, 95% of students needed a UNBK simulation application. The school list is shown in the following table 1.1.

Table 1 .1 List of School where Needs Identification take place.

NO	SCHOOL	Respondents
1	MTSN 1 MAKASSAR	73
2	SMP NUSANTARA	29
3	SMP 17 MAKASSAR	28
4	SMP 25 MAKASSAR	37
5	SMP 28 MAKASSAR	30
6	SMP 36 MAKASSAR	30
7	Junior High School 44 ONE ROOF MAKASSAR	25
8	SMP 6 MAKASSAR	119
TOTAL		371

Based on the survey, preliminary data was obtained that the CBT simulation application is needed by students and schools to prepare students to face UNBK. The material presented is subjects entering UNBK, but some schools wish to be able to add other subjects themselves according to school needs.

The CBT questions covers four subjects tested in the Ministry of Education and Culture examination, those are Bahasa Indonesia, English, Mathematics and Science. The resulting application can be accessed via a stand-alone browser, LAN, or WAN. The application was developed using the PHP programming language with the *CodeIgniter framework*.

Table 1 .2 Scope Development of CBT application

No.	Scope	Information
1	Level	Junior high school
2	Content	Subjects: 1. Bahasa Indonesia 2. English 3. Mathematics 4. Science
3	Access	<ul style="list-style-type: none"> ● Stand-alone ● LAN ● WAN
4	Engine	PHP (CodeIgniter)

b. Identify Learner Characteristics

The identification of these user characteristics includes mental characteristics and readiness using the CBT application. Users of the CBT application developed are junior high school students, especially class IX. The average junior high school student is in the range of 13 to 17 years old who enter the early stage of adolescent development. At this stage, the prominent characteristics are the pleasure of experimenting and

exploring, and the tendency to form groups and work in groups. Digital literacy skills have started in the generation of 1980, while junior high school students have been in the generation of 2000, of course, IT skills are no doubt. Prensky divides IT literacy skills into two, namely digital natives and digital immigrants (Guo, 2008). Digital natives or the generation of new millennium learners (NML) or net generation are humans born in the 1980s (Kang, 2010).

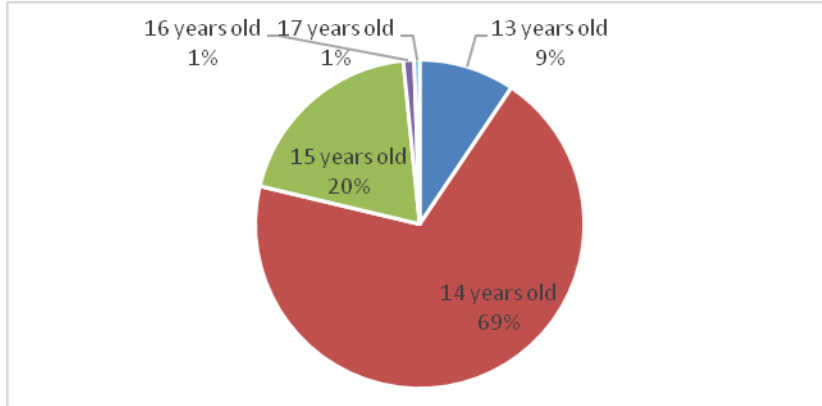


Figure 1 .2 Age distribution of the user

These three characteristics can support the use of CBT applications where they can learn in groups to practice testing their abilities in answering the questions given. Display in the design as attractive as possible to facilitate its use. Cognitive development of junior high school students is the last and highest period in the stage of formal operation growth (period of formal operations) where students are able to think abstractly, namely thinking about ideas and thinking of several alternative solutions to problems and no longer receive information as is. They will process that information and adapt it to their own thoughts, so that the application of CBT can be applied both formally in schools and informally according to the time spent by students. Based on the cognitive development of the target users, the questions are designed in such a way as to have the same weight as the actual UNBK. Ega Nugraha AS, in her research on the development of computer-based testing (CBT) applications for conducting academic potential tests, and the results showed positive responses from respondents of junior high school students (Universitas Pendidikan Indonesia | repository.upi.edu | libraries.upi.edu. 2015) .

The second identification of characteristics of CBT users is based on readiness to use the application. Based on the user readiness questionnaire, data obtained that 100% of students have been able to use computers, 95% of students need CBT simulation applications for real UNBK preparation, 81% of students already have a device to access the internet, 99% of students are able to access the internet every day.

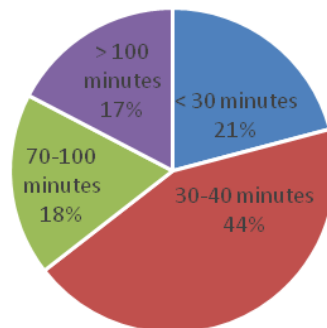


Figure 1 .3 Duration of Students Computer Use

On average students use computers for 30 minutes a day, even 20% of students spend more than 100 minutes a day accessing computers. This indicates that students are used to touching computer applications. The fulfillment of the prerequisites for knowledge of computer use and the availability of facilities to access CBT are the supporting factors for the successful implementation of the program. Interesting things are found on user devices, where 90% of students access more using mobile devices than desktops. This is very important information in the development of CBT applications where the applications developed must be responsive to the diversity of user devices, especially on the display on smartphones.

In addition to identifying students, the development team also conducted interviews with principals and teachers who were facilitators in the application of CBT applications. Data were obtained that the average teacher has a computer and always accesses the internet. This is also the basic information in the training that will be carried out by the development team about how to use this CBT application, starting from registration, adding questions, and seeing the results of student tests. Meanwhile, the results of interviews with the headmaster of the development team were assured that the infrastructure for the application of CBT in schools had been fulfilled, such as the LAB computer equipped with air conditioning and computer servers, adequate electricity flow, and internet networks. In addition, the school principal also added that the human resources in his school are qualified for the implementation of the CBT application.

IV. CONCLUSIONS

The scope of the Computer Based Test (CBT) application development research is limited to the level of Junior High School (SMP) in Makassar city. Region determination is based on the consideration that Makassar city is the largest UNBK implementing location for the South Sulawesi region with a hundred percent percentage so that CBT application is needed to be used in UNBK simulation. Besides that, based on the data, information was obtained that 99% of junior high school students can access the internet and 95% of respondents need the application for training in preparing themselves for UNBK.

1. Identification of user characteristics includes mental characteristics and readiness using the CBT application. Students at this stage like to experiment and explore, and the tendency to form groups and work in groups. These three things support the use of CBT, while the readiness of one hundred percent students can use computers and even have internet devices used every day. In addition, on average students use computers more than thirty minutes a day, and as many as ninety percent of students access the internet using mobile devices rather than desktops.
2. Based on the foregoing, CBT needs to be developed more broadly, not only in certain schools but in all junior and senior high schools by taking into account the needs and characteristics, readiness of facilities and infrastructure support and all parties involved in school management.

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