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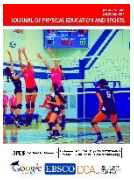

Design Android Applications My Mind Mapping (M3) Physical Education, Sport, & Health Subject Curriculum 2013 for Teachers Guidance Xth Grade Vocational High School

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Abstract

The android app on the smartphone makes it easy for a user to communicate and get access to various information. The purpose of this research is to design an android based application in the form of mind mapping. This application is a form of transformation from the manual form (book, e-book, module, etc.) to digital form in the form of an application containing Core Competence & Basic Competence, materials, and learning model for teacher guidance of Physical Education, Sport, & Health Subject Xth grade Vocational High School. This research uses ADDIE model which includes analysis, design, development, implementation, and evaluation. The results of the product trial at first stage curriculum experts with the average score of 3.4 (67%) included the "adequate" category and second stage with the average score of 4.5 (90%) including the "excellent" category. The trial of the product at first stage multimedia / IT expert with an average score of 3.4 (68%) included the "adequate" category and second stage with an average score of 4.5 (89%) included in the "excellent" category. The test of product effectiveness on a small scale with an average rating of 4.24 (84.7%) was rated "excellent". The test of product effectiveness on a large scale with an average rating of 4.18 (83.5%) is categorized as "excellent". Conclusion, that the android application product My Mind Mapping (M3) Physical Education, Sport, & Health Subject Curriculum 2013 is effective used for teacher guidance Xth grade Vocational High School.

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INTRODUCTION

Education in Indonesia is a system that means that the success of education in Indonesia is influenced by various things such as curriculum, educators, learners, facilities, and infrastructure are all integrated to achieve the same goal of improving the quality and quality of education in Indonesia. Education has a pedagogical goal, therefore education is incomplete without physical education, sports and health since motion as a physical activity is the basis for a man to know the world and himself that naturally develops in the direction of the times. (Octaviansyah, 2015)

Physical Education, Sport, & Health is subject taught from primary to secondary education. The learning process of physical education from the side of sports teacher is expected to be able to teach with various skills possessed from basic motion teaching, basic technique, game strategy, teaching students to have the attitude of discipline, tolerance, honesty, cooperation, sportsmanship, the teacher teaches students the habits of the healthy lifestyle. (Febriani, 2016)

Increased professional competence of a teacher is supported by the development of Science and Technology. In many areas, technological developments create constraints in the space of time and place to be traversed by the presence of technology, information, and computers. The emergence of various e-jargon, ranging from e-books, e-learning, e-laboratory, e-education, e-library where "e" interpreted electronics, digital electronic technology (Herjanata, 2017). With so many technologies available, teachers and students can access many things of information and make use of them, and explore their potential (Ferreira, 2015).

The development of science and technology encourages various reform efforts in the learning process. Meanwhile, teachers are required to be able to utilize information and communication technology for self-development (Marhadini, 2017). We use different technologies to search for and provide resources and information, express ourselves, communicate with others, create, consume, and play, often assuming new identities and many things (Lim, 2013).

Educational technology has three domains of use (1) technology as a tutor (computer guiding and guiding users), (2) technology as a teaching tool and (3) technology as a learning tool. The application of educational technology improves skills and cognitive characteristics. With the help of this new technology comes a burst of learning and the reception of new information, especially on mobile devices (Stošic, 2015).

Knowledge is mediated from generation to generation through genes and is socially expressed through instinct. With spoken language, it is possible to mediate the learning experience from generation to generation. Having acquired the spoken language, other media have been achieved, which has expanded the possibilities of education: writing, printing, analog electronic media and now digital media (Paulsen, 2013). In the last twenty years, a large amount of educational material is available on the internet: books, scientific research, presentations, video tutorials, educational games, etc. (Kljunic, 2015).

We are witnessing the emergence of connected societies, especially with the widespread use of mobile devices and smartphones (Al-Jundi, 2017). The advent of mobile and wireless technologies has had an impact on education (So, 2008). The literature on mobile learning and teacher education is generally considered mobile learning with an approach that extends the teacher's learning experience and enhances the teacher's mobile technology integration skills (Baran, 2014).

Android is based on an open source framework and comes with pre-built applications such as dialers, address books, browsers, etc. Developers can decode their own apps and publish to the Android market after a self-signing phase that does not require any certification authority ie, developers can use homemade certificates to sign their applications (Dar, 2013).

The substance of the learning activities in the school is on the materials and lessons. Without the materials and learning materials,

teaching and learning process will not be able to walk because no study is studied. Selection of learning materials generally includes the way of determining the type of material, depth, scope, order of presentation, treatment of the subject matter, etc. (Sulaiman, 2016). Smartphones can be utilized in the learning of one of them to package the material systematically in an application. Applications on smartphones can be programmed to download on Playstore through online connection for commercial purposes. But some apps are designed to be instantly transferable via Bluetooth, Share-it, or other transfer media without any commercial elements.

The result of preliminary study that has been done in SMK NU Ungaran and SMK Widya Praja Ungaran on 5 teachers of Physical Education, Sport, & Health as respondents, the response of the first question of teachers who read and study the material from the books of learning resources Physical Education, Sport, & Health before teaching as many as 1 person (20%), with response sometimes 3 people (60%), and 1 person (20%) did not read and study the material before teaching. In the second point, teachers who read & study material from the web/internet before teaching as many as 2 people (40%) and 3 people (60%) with the response sometimes. On the third point, 5 people (100%) teachers feel more practical by reading & studying material searching using smartphones before teaching. In the fourth point, 5 people (100%) of teachers feel need to make an application about learning materials accessed using a smartphone. At the fifth point, 5 people (100%) teachers will use if an application is made about learning materials accessed using a smartphone.

The results of the preliminary study above illustrated the information that the teachers in the field feel more practical searching material by using a smartphone. The researcher's plan to develop Android-based learning applications has received the positive response from respondents.

Relevant research has been done by Titting Fellyson (2016) with the title "Development of Android-Based Gymnastic Learning Multimedia on Physical Education, Sport, & Health at SMA", the results of the effectiveness test of multimedia products based on Android floor based gymnastics with the overall average is "Very Good" is 81.4%. This product is effectively used for teachers & students (Fellyson, 2016).

The purpose of this research is to design an android based learning application. This app is designed to contain materials that match Core Competence (KI) and Basic Competence (KD) subject matter of Physical Education, Sport, & Health. The application of mind mapping is the transformation of contents of material contained in the book into a more accessible, inexpensive, and practical application. Compared to other digital-based references such as e-books this application has the advantage that the material is presented in the form of a mind mapping that is more concise but does not reduce the essence of the material itself. Teachers do not need to read books on electronic books (e-books) that contain theories with long explanations. The application of mind mapping in the development research is also expected to help to improve the mastery of materials and academic studies of teachers of Physical Education, Sport, & Health in practical, easy, cheap, and current. The rest can effectively be used as a teaching guide for schools that have implemented curriculum 2013, as the content of this application is designed in accordance with current curriculum 2013.

METHODS

This research uses ADDIE model (analysis, design, development, implementation, evaluation). ADDIE is one of the commonly used models in the field of instructional design guides to produce effective designs.

The research procedure covers two main stages: preliminary study stage and development stage. In the preliminary study stage, there are four stages: problem discovery, literature study, field study, and continued initial data collection. At the development stage, the first is the analysis phase, the researcher conducts a study of the curriculum material literature 2013 from various sources (K-13 teacher books, K-13 student books, books and websites on relevant material). Researchers make the selection of material as

mind mapping material that will be designed after the analysis phase. The second stage designs, researchers do cooperation with a competent programmer in making Android applications. The programmer will create a prototype of mind mapping products. The programmer does not change the content that contains the material that the researcher has analyzed in the previous stage.

Furthermore, at the development stage, programmers start to create mind mapping product applications. This prototype is then consulted to curriculum experts & IT experts. Assessment and response from curriculum experts & IT experts in the form of filling questionnaires. This assessment will be subject to revision I of two revisions to be made in the manufacture of the product. After revision I, this product will be directly made into the original product for its effectiveness tested on the teacher of Physical Education, Sport, & Health. Implementation stage, original product that is in the form of mind mapping application with the name of My Mind Mapping (M3) already can be used on a smartphone by transferred through data transfer media like Bluetooth or Share-it. Evaluation phase is done by product effectiveness test to teachers of Physical Education, Sport, & Health in schools applying K-13 using questionnaire.

Data sources in this research are teachers of Physical Education, Sport, & Health teaching in vocational schools, curriculum experts, and Multimedia / IT experts. Teachers of Physical Education, Sport, & Health provide an assessment of application products. Curriculum experts provide information on the legal basis, structure, and implementation of Curriculum 2013. Multimedia Experts / IT provides an overview of how to visualize an android product with the latest models. In addition, curriculum experts and multimedia / IT experts also provide assessment, criticism, and suggestions about the results of application products.

The analysis used to test the feasibility of the product is a questionnaire that uses an option with a Likert scale of 1-5, with very poor (SK), less (K), sufficient (C), good (B) and excellent (SB) categories. The final result of the analysis of this questionnaire test is expressed by the formula:

$$P\ (\%) = \frac{f}{N} \times 100\%$$

P = Results to be searched for in percentages
f = The number of scores to be searched for the percentage
N = score criteria obtained from the maximum score of the questionnaire

Questionnaire feasibility criteria can be seen in the table as follows:

Table 1. Interpretation of Score

%	Category
0 – 20	Very less
21 – 40	Less
41 – 60	Enough
61 – 80	Good
81 – 100	Very good

(Source: Mahardini, 2017)

RESULTS AND DISCUSSION

The design of Android-based applications in this research has been done in accordance with the research stages of the ADDIE model. In the analysis phase (analysis), researchers conducted a study of Curriculum material literature 2013 from various sources (teacher book Curriculum 2013, student book Curriculum 2013, books and websites on relevant material). Researchers chose the material in the form of mind mapping designed to be the content of each icon in the application. The researchers added learning models that could be the reference of teachers in designing learning plans and evaluations. The second stage is the design, researchers do cooperation with a competent programmer in making Android applications. Researchers create a blueprint design that contains the content of applications that are designed. The third stage is the development, programmers have made prototype application of mind mapping products according to blueprint.

This product is then consulted to curriculum experts & multimedia / IT experts. Assessment and response from curriculum

experts & multimedia / IT experts in the form of questionnaires. This assessment becomes the revision I of two revisions made to the manufacture of the product. After revision I, this product was immediately made into an original product to be tested for effectiveness in teachers of Physical Education, Sport, & Health. The fourth stage is the implementation of the original product in the form of mind mapping application with the name of My Mind Mapping (M3) can already be used on the smartphone by transferring through data transfer media such as Bluetooth or Share-it.

The products were socialized on a limited basis to the peer-to-peer sharing activities of 10 Physical Education, Sport, & Health teachers on Monday, May 9, 2018 at Bawen, Semarang District to then test the effectiveness of the products on a small scale.

Next is the limited socialization on the activities of Physical Education, Sport, & Health Teachers Association (MGMP) Vocational High School on Friday, May 13, 2018 with participants attending 31 teachers of Physical Education, Sport, & Health Public and Private Vocational High School in Semarang Regency. Evaluation is done by concluding the score of the result of questionnaire filling/questionnaire. The results of the questionnaire scores represent the assessment of the effectiveness of the product.

The resulting Android app product is called "My Mind Mapping (M3)". This app consists of several main menus and sub-menus.

The Competency Menu contains the Core Competencies & Basic Competencies. Basic Competence & Basic Competency 3 is a competency that includes knowledge competence (cognitive). Basic Competence & Basic Competence 4 is a competency that includes the competence of skills (psychomotor).

The material menu contains materials that are the breakdown of basic competencies. The material is structured from Basic Competence (KD) 3.1 to Basic Competence (KD) 3.9 on knowledge and basic competence (KD) 4.1 to Basic Competence (KD) 4.9 aspects of skills.

Learning model menu consists of several learning models that contain the understanding and characteristics of each model of learning. Learning model menu comes with offline link example Lesson Plan that can be a user reference in planning the learning process.

The additional menu in this application is Motivation menu that contains a motivation sentence and Profile menu that contains the researcher's brief identity.

My Mind Mapping (M3) products can be operated directly after download without having to update on all smartphone types. In addition to downloadable on PlayStore, apps can be transferred via an offline transfer media such as Share-it and Bluetooth.

Display My Mind Mapping icon (M3) on the menu screen of a smartphone.

Figure 1. Icon My Mind Mapping (M3)

The opening screen display in My Mind Mapping (M3) app on the menu screen of a smartphone on figure 2. Display the main menu in My Mind Mapping (M3) app on the menu screen of a smartphone on figure 3. Competency menu display in the My Mind Mapping (M3) app on the smartphone menu screen on figure 4.

The display on the menu of each material contains (1) understanding, (2) tools/equipment (offline link field image), (3) basic technique, and (4) important terms. While on the menu each learning model contains: (1) understanding, (2) characteristics, and (3) Lesson Plan (offline link) example.

Figure 2. Display Screen Opener

Figure 3. Main Menu

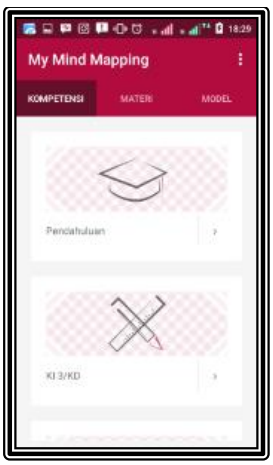


Figure 4. Competency Menu

Display the Material menu in the My Mind Mapping (M3) application on the smartphone menu screen.

Figure 5. Material Menu

Display the Learning Model menu in My Mind Mapping (M3) app on the menu screen of a smartphone that is:

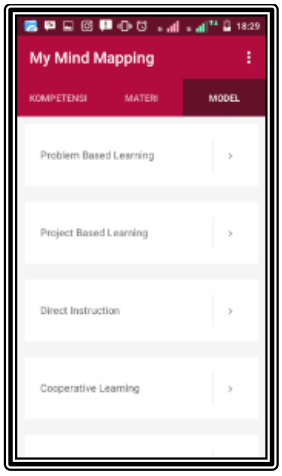


Figure 6. Learning Model Menu

Extra menu display that is Motivation & Profile on My Mind Mapping (M3) application on smartphone menu screen. (Figure 7)

The results of tests conducted by curriculum experts, multimedia / IT experts, and teachers of Physical Education, Sport, & Health SMK in Semarang Regency shown on the graph in the form of the percentage.

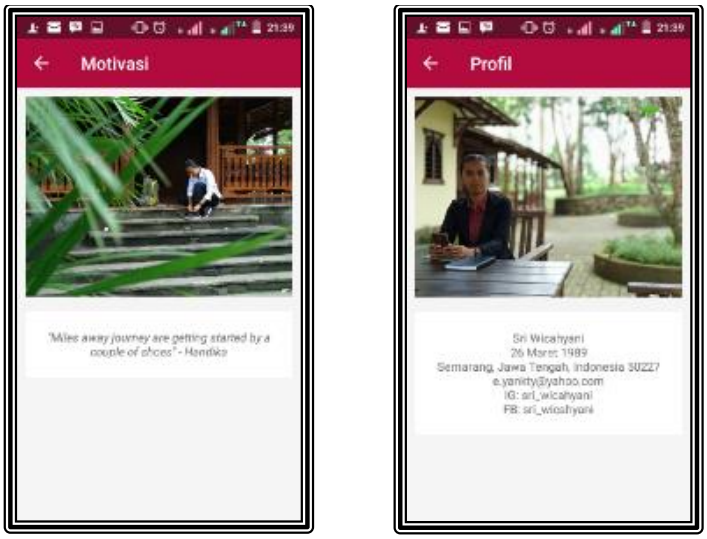
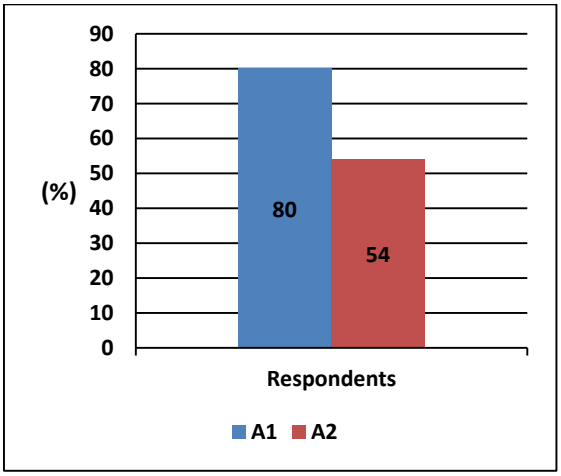


Figure 7. Motivation & Profile Menu

The curriculum experts who became the validators in this research are Hermawan Pamot Raharjo, M.Pd. and Donny Wirayudha Kusuma, Ph.D. Validation of curriculum experts in this study was conducted in two stages.

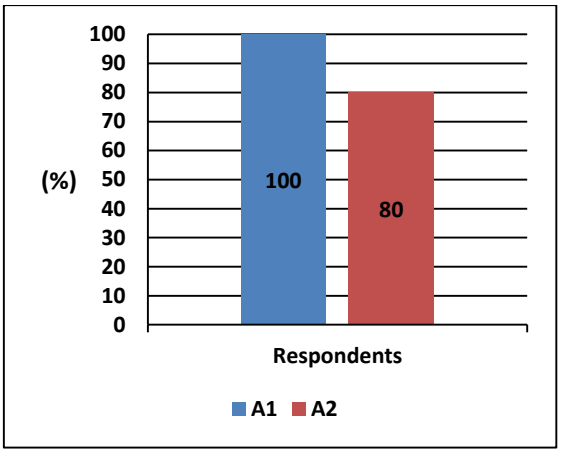
Questionnaires by curriculum experts are (1) Conduct assessment in terms of contents product design applications. (2) Provide criticism and suggestion on facet contents of application product design.

The graph of curriculum expert validation results in stage 1 is as follows:



Graph 1. Expert Validation Chart Curriculum (First Stage)

The graph of curriculum expert validation results in stage 2 is as follows:

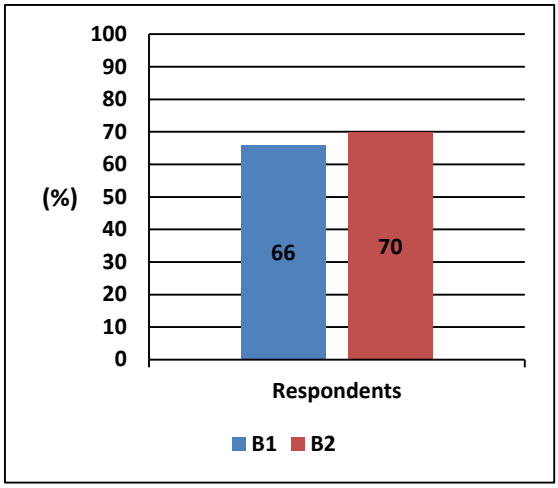


Graph 2. Expert Validation Chart Curriculum (Second Stage)

Multimedia / IT experts who became the validator in this study namely Pratama Bayu Widagdo, S.Sn., M.Ds. and Sigit, M.Kom. Validation of multimedia / IT experts in this study was conducted in two stages.

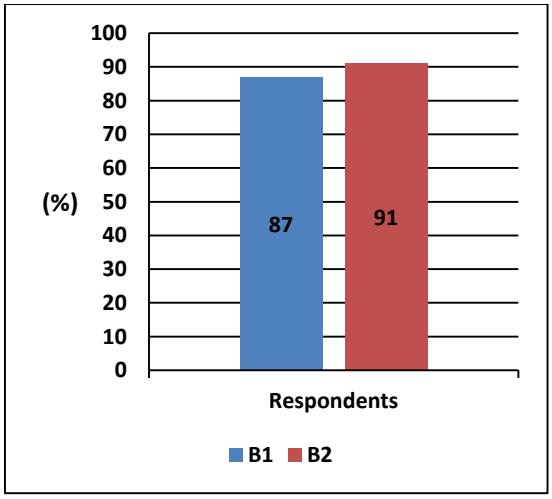
Questionnaires by expert multimedia / IT that is (1) Perform assessment in terms of visualization of product design applications. (2) Provide criticism and suggestions on the visual aspect of product design application, in terms of color, font, font size, background, icon, picture, menu & submenu, etc.

The graph of validation results of multimedia / IT experts in stage 1 is as follows:



Graph 3. Expert Validation Results Multimedia/ IT Stage 1

The graph of validation result of multimedia expert / IT at stage 2 is as follows:



Graph 4. Multimedia Expert / IT Experiment Stage 2

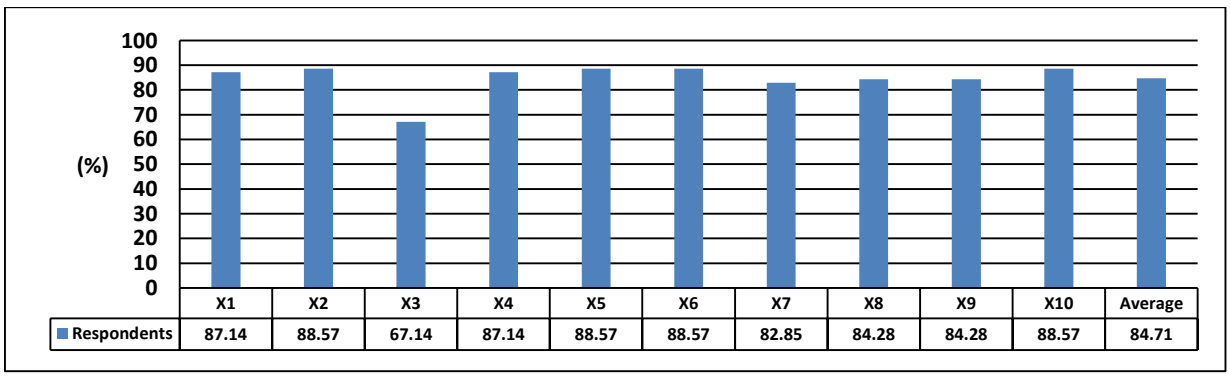
Vocational teachers provide an initial response in the form of feedback in an interview about the disclosure of problems taken by researchers. Teachers also provide a final response in the form of a questionnaire about the effectiveness of products designed by researchers. Teachers of Physical Education, Sport, & Health who teach in SMK in Semarang Regency provide information about the problem in organizing learning process of Physical Education, Sport, & Health as research background.

Teachers who are the subject of research are (1) Small-scale: Teacher of Physical Education, Sport, & Health Xth grade as many as 10 people who teach at SMK in Semarang regency, (2) Large scale: Teacher of Physical Education, Sport, & Health Xth grade as many as ± 30 people who teach SMK in the district of Semarang.

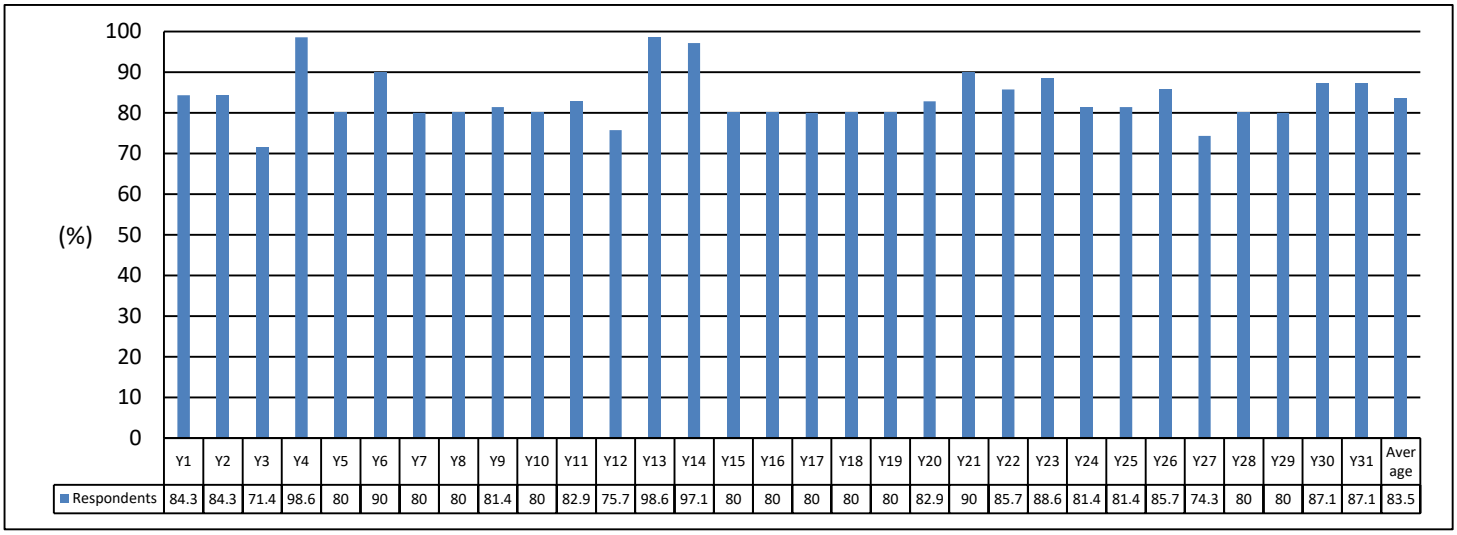
Graphs of small-scale effectiveness test results (Graph 5), Graph of large scale effectiveness test results (Graph 6).

Experimental curriculum A1 & A2 curriculum in stage 1 gives scoring scores with an average of 3.4 or 67% including the "adequate" category. A1 & A2 curriculum expert Experiments in phase 2 provide scoring scores with an average of 4.5 or 90% including the "excellent".

The multimedia / IT expert Validator B1 & B2 in phase 1 provides the rating scores with an average of 3.4 or 68% including the "adequate" category. The multimedia / IT expert Validator B1 & B2 in phase 2 provides the rating score with an average of 4.5 or 89% including the "excellent" category.



Graph 5. Graph of The Effectiveness Test Small Scale Product



Graph 6. Graph of The Effectiveness Test Large Scale Product

Results of product effectiveness test on a small scale with an average score of 4.24 or 84.7% including the category of "very good". While the results of product effectiveness test on a large scale with an average score of 4.18 or 83.5% including the category of "very good".

My Mind Mapping products have disadvantages and advantages compared to Physical Education, Sport, & Health, module, and e-book books on Physical Education, Sport, & Health materials Xth grade that used by the teachers in the field as a guide and source of teaching materials. In terms of the form of My Mind Mapping shaped android applications while books and modules in the form of prints and e-book shaped softcopy.

In terms of practicality, My Mind Mapping is more practical to carry anywhere because it is installed in the smartphone user compared with books and modules that are less practical. My Mind Mapping can be reproduced either online or offline via Bluetooth transfer media, Share-It, Playstore, etc. The material in My Mind Mapping is mind mapping, more concise and in line with the latest K-13 spectrum. In addition, My Mind Mapping is also equipped with a menu of learning models.

In the learning model menu, there are several models of learning commonly used by teachers of Physical Education, Sport, & Health at the time of teaching. So also added examples of Lesson Plan on each model of learning to make it easier to understand the basic concepts of each model of learning.

My Mind Mapping application becomes a supporter in the implementation of Curriculum 2013 throughout Indonesia. Application products can be reproduced to be applied in the field by teachers of Physical Education, Sport, & Health Xth grade Vocational High School with the advantages of easy to use, practical, and in accordance with the latest 2013 Spectrum Curriculum.

CONCLUSION

This research has produced the product of android application My Mind Mapping (M3) Subject of Physical Education, Sport, & Health Curriculum 2013 for guidance teachers Xth grade Vocational High School.

Product of My Mind Mapping android application (M3) Subjects of Physical Education, Sport, & Health. Curriculum 2013 for Teacher Guidance Xth grade Vocational High School is effective for use by teachers based on effectiveness test results conducted on curriculum experts, multimedia/IT experts, and teachers of Physical Education, Sport, & Health on a small scale as well as on a large scale.

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