Design And Development Of A Mobile Learning For Career Planning In Senior High School

Nia Veronica, Edi Purwanta, and Budi Astuti

Abstract: As the development of science and technology are increasingly sophisticated, mobile learning in the twenty-first century produced a tremendous impact on education. This article aims to design and develop a career guidance media that can be used on mobile phone devices to improve student career planning in high school. The research method uses Research and Development (R&D) to produce products in the form of mobile learning applications to improve student career planning in high school. The results of this study are mobile learning designs consisting of display design and content design in the form of flowchart. This design can be used to design and develop mobile learning devices as a media for career guidance to improve student career planning in high school. Through mobile learning is expected to help students access information anytime and anywhere so that the process of providing career information services becomes more effective and efficient.

Index Terms: Mobile Learning, Career Planning, Senior High School

1. INTRODUCTION
Along with the progress of Science and Technology in the industrial revolution era 4.0. Laptops, gadgets, mobile phones, and others are technological devices that can support cellular learning [1]. Mobile Phone is one of the very fast growing media in recent years [2, 3]. The Mobile World states that in 2014 mobile device users in the world reached 4.25 billion units [3]. The data states that half of the world's population uses mobile devices. This is in line with Research and Communication and UNICEF and Bukman Center for the Internet and Society, Harvard University (2014) which states that "the use of social and digital media is an integral part of the daily life of young Indonesians [4]. This study found that 98 percent of children and adolescents were surveyed about the internet and 79.5 percent of them are internet users ". Then, APJII (2018) Indonesian Internet Service Providers Association revealed that, based on the education level of internet users the high school level reached 90.2% [5]. This data was obtained from 171.17 million users who use the internet. In addition, there are various programs (software) that can be utilized as an effective and interactive guidance media. One of them is an education based application such as mobile learning. Mobile learning produces educational methods that are far more variety and innovation [7]. In line with this Leuciano said that educational content was most liked by android users [8]. Then, support by research conducted by NAECY in Radich (2013) states that children today are "digital native" meaning they are born in the digital era and digital equipment is part of their daily life [9]. Agree with research that conducted by NAECY, Brown stated that mobile learning is often associated with developments between technological relations as a medium of communication and knowledge that can be given anytime and anywhere [10]. In line with this, Dikkers (2011) said that mobile learning is a process of transferring information and communication capacity that comes from the center and is given to students [11]. Mobile phone and internet networks are an inseparable unit in daily life. On average all schools in Special Region of Yogyakarta currently have internet facilities. This is consistent with observations made by researchers in several high schools in Yogyakarta. Researchers found that many students use mobile phones only for non-academic activities such as playing games, then opening Facebook, Instagram, WhatsApp, YouTube and other social media. Super explained that high school students are in the crystallization period [12]. Then, as explained by Super in the perspective of adolescent career development is at a tentative stage [13, 14]. One of the tasks of developing high school students is to prepare for a future career. High school students are in a period that is closely related to the determination of life in the future, because the behavior and activities carried out in adolescence are the beginning in carving a better life in their future [15]. The career preparation of students in high school is not far from problems. Based on BPS data on August 2018 shows that the highest joblessness rate is SMK graduates by 11.24% and SMA by 7.95% [16]. Based on this data it means that there are still many high school graduates who have not yet reached a good career. High school students experience a transition and crisis point when they have to make choices related to their careers. Transitions and critical points are generally associated with the selection of universities, study programs, training to be followed and etc [17]. This will cause students to choose the wrong department. This statement is reinforced by Daharnis and Ardi (2016) which states that there are still many students who have career interests that are not in accordance with the department they were taking [18]. In addition, Green (2015) says that most individuals begin their careers after they graduate from school or college and take any job that sounds attractive with a decent salary without regard to the match between their talents and interests [19]. Avoiding failure in career attainment requires careful career planning. Careful career planning can make students confident in the career choices they will continue. Parsons formulated that career planning as a process that must be passed before making a career selection [20]. Meanwhile, according to Yean & Yahya (2013) said that career planning is an activity that makes a person to be responsible and develop his career [21]. Therefore, guidance and counseling teachers are very important in efforts to provide career guidance to students. Guidance is defined as the process of providing assistance to individuals to achieve optimal levels of selfdevelopment [22]. Whereas according to super career guidance is processe of helping a person to develop and accept an integrated and adequate picture of himself and of his role in the world of work to test this concept against reality, and to convert it into a reality, with satisfaction to himself and to society [20]. In addition, teacher guidance and counseling play an important role in providing career information to students, both as a facilitator and as a mediator. Information service is a service to equip students with knowledge about data and facts in the field of school education, the field of work, and the field of social
personal development, so that those who learn about their environment are more capable to organize and plan their own life [20]. Career information can also be provided through career exploration, according to Purwanta (2012) career exploration is a complex psychological process, which is an effort to find and test information about self-characteristics relating to weaknesses and strengths and test information about the career environment relating to opportunities and threats in order to achieve the goal [24]. Then, according to Iwuama, career information aims to help students understand themselves and manage careers appropriately so that they have good career development in the world of work [25]. Thus, guidance and counselling from teacher can provide career information to students using appropriate and interesting technology that follows the changing times. Career guidance media is a tool to dispense messages that can stimulate the thoughts, feelings, attention and willingness of students to understand themselves, direct themselves and be able to make decisions, and can solve the problems they face. In accordance with AECT (Association of Education and Communication Technology) that simplified by Nursalim (2015) states that the media are all forms and channels that are used for dispensing messages [26]. There are a lot of benefits of technological advances today, one of them is that students can find career information from various sources anywhere and anytime. One learning model developed using information technology is the blended learning model [27]. Thus the development of career guidance media design is produced using technology that is packaged in the form of an android application called mobile learning. Mobile learning is one of the learning models that uses cellular technology devices that can support learning [28]. In addition, mobile learning is a very flexible approach, which allows students to study anywhere and anytime [29,30]. With mobile learning, it is expected that it will facilitate teacher guidance and counseling in providing career guidance services to students. This article aims to design and develop a career guidance media that can be used on mobile devices as a solution to improve student career planning in high school. Thus as a smart solution to help high school students overcome difficulties in self-knowledge, career knowledge, and make career decisions.

2. RESEARCH METHODS
The research and development design(R&D) produces a mobile learning application development model that is expected to help improve student career planning. The design of this study uses a development model developed by Borg and Gall [31]. This research will be conducted at SMA Negeri 5 Yogyakarta, located on Jl. Nyi Pembayun No.39, Prenggan, Kotagede, Yogyakarta City, Special Region of Yogyakarta. The subjects of this research were students of Class X Science 1 at SMA Negeri 5 Yogyakarta. Data was collected through questionnaires, literature review and interviews. Research and development steps according to Borg and Gall consists of 10 steps namely:

1. Research and information
   First, the needs analysis is the researcher analyzes the problems that exist in students related to career planning, at this stage the researcher conducts an unstructured interview to the teacher’s guidance and counseling. Students need career information media for future career planning. Next, the second is the study literature by reviewing several materials related to careers, especially career planning.

2. Planning
   Arranging a research plan, covering the abilities needed in conducting research, formulation, objectives to be achieved with this research that is to produce a career guidance media. The resulting media is in the form of a mobile learning application which will later be made into a trial media.

3. Develop preliminary form product
   Developing of product design, at this stage researchers create and compile material on career planning for high school students and then serve as the initial design of mobile learning in the form of flowchart.

4. Preliminary field testing
   The initial field trials will be tested for eligibility by material experts and media experts. Then, the feasibility test is conducted before the mobile learning is tested on students in the initial field trials of 3 students who are subjected to trials.

5. Main product revision
   Improving the results of the initial field trials. Mobile learning that has been validated by experts is then revised according to expert advice.

6. Main field testing
   Conducting a wider trial in small groups, as many as 5 students tested subjects using free sample selection techniques.

7. Operational product revision
   Results from the main field trials, if there are suggestions the researcher will revise the suggested products.

8. Operational field testing
   Operational field trials are carried out with trials on the use of large groups, namely operational field trials subjects. At this stage, mobile learning was tested on 30 students of Class X Natural Science 1 in SMA Negeri 5.
Yogyakarta.

9. Final product revision
The researcher revises the final product as suggested by the operational field test. Then, the revised product will produce a mobile learning application for student career planning in high school. Furthermore, the product is ready to be implemented to be mass produced and ready to use.

10. Dissemination and implementation
Researchers implemented and disseminate products. Collaborating with publications or journals with the aim of increasing the use of products in the form of mobile learning applications to improve student career planning.

This research is only limited to 3 stages, this is due to the limited time and expertise of researchers to carry out the next stages. Thus the design is ready to be tested by material experts and media experts. Furthermore, data analysis techniques used qualitative and quantitative data analysis.

3. RESULT
The relevance of education and employment, needs to be adjusted to the development of the era and science and technology while still paying attention to aspects of humanities [32]. Facing the challenge 4.0, guidance and counseling teachers are required to be creative and innovative in providing career guidance services to students. Effective and efficient career information services can help students improve career planning. Student career planning must be matured since high school so there are no mistakes in the selection of majors when in college. The selection of majors must also be based on their talents and interests. This is a preventive movement carried out by the guidance and counseling teacher in the guidance and counseling service. Based on the results of a focus group discussion with 15 counseling guidance teacher of high school in Yogyakarta stated that they often have limited time in providing career guidance services to students so giving the career information services becomes less effective. Therefore, they need interesting media to provide career guidance information services to students. Because, so far the media that was used is print media such as guidance boards, posters, leaflets, and career trees, the unavailability of electronic media such as mobile learning. Sanjaya (2014) through technology students can learn anywhere and anytime according to their interests and learning styles [33]. The media in question must follow the changing times such as applications, web and digital modules. One of the media that will be designed by researchers is the design of mobile learning applications. From the results of student assessments, it states that> 85% of students are very interested in mobile learning [34]. Then, the results of other studies show that cellular technology has a positive impact on students [35]. In addition, the use of mobile phones can realize the implementation of student-centered activities [36]. Han & Sin (2016) revealed that students who use mobile learning in the learning process have a significant improvement based on tests that have been conducted [37]. The advantage of mobile learning is that it can help students learn anywhere and anytime. In addition, other advantages of mobile learning are providing individual and group learning opportunities to students, facilitating alternative guidance processes and effective guidance methods for seeking career information, students are given the opportunity to respond [38]. The design of mobile learning as a media for student career planning in high school is an effort to provide technology-based guidance services that can help students improve career planning. So they can choose a career according to their potential. This mobile learning application program is based on aspects of career planning that is, having self-knowledge and understanding, knowledge and understanding of the world of work, and realistic reasoning about the relationship of knowledge and understanding of self and the world of work. Because self-knowledge and knowledge of the world of work are important requirements in the decision making process [39]. Thus the guidance and counseling guidance teacher must be able to use appropriate methods according to the needs of students [14]. Mobile learning is a tool for channeling career information to students so they can plan future careers. Comprehension that was obtained through information services is used as a reference in making career decision. This is consistent with the results of research by Falentini (2013) that many factors considered in determining the direction of career, one of them is to develop ambition in accordance with current career choices [40]. So hopefully high school students are able to determine their future careers. The results of development research conducted by Hartono and Soedarmadj (2018) show that computer-based career guidance application programs provide a positive response to the needs of students and the development of science and technology [41]. Computer-based career guidance application program as a model of career guidance services in high school that serves as a media to increase independence in choosing a career. Furthermore, relevant research was conducted by Masluchah, Hanik (2016) who developed a career planning module for class X students of SMA Negeri 7 Surabaya [42]. Previous studies using print media while the research to be conducted by researchers is electronic or online media. The process of providing career guidance information services in the era of the industrial revolution 4.0 is one of them by combining online and offline learning called blended learning methods [43]. Blended services in guidance and counseling are services that combine the advantages of three main sources, namely: (1) face to face, (2) offline, and (3) online [44]. This is reinforced by a study conducted by Atmoko (2017) stating that guidance and counseling services based on blended learning are the best choice to increase the effectiveness and efficiency of BK services in schools [44]. Thus it can be concluded that the guidance and counseling teacher must have the right strategy in providing career information services to students. Through the development of mobile learning, it is expected to help students plan their careers. These are the stages that carried out in research development, the first step is the needs analysis, the researcher analyzes the problems that exist in students related to career planning, at this stage the researcher conducts an unstructured interview to the guidance and counseling guidance teacher. Students need career information media for future career planning. Next, study literature is by reviewing some material related to career, especially career planning. The second step is to compile a research plan, covering the abilities needed in conducting research, formulation, objectives to be achieved with this research that is to produce a career guidance media. The media that was produced is mobile learning application and will be used as trial media. Then, the third step is the researchers make and compile material about career planning for high school students and
then serve as the initial design of mobile learning in the form of flowcharts. The Mobile Learning flowchart as a Media for Career Planning is as follows:

![Flowchart of mobile learning](Image)

**Pict 2 Flowchart of mobile learning**

**Information:**
- Menu
- Connecting line

**Explanation:**
1. The program starts from the start and then enters the home menu. There are 6 alternative menu choices: the help menu, the introduction menu, the material menu, the interest search menu, and the developer profile menu.
2. Menu material that has 6 personality types that is realistic, investigative, artistic, social, enterprising, and conventional.
3. An interest tracking menu will provide feedback to students so students can see their interests.
4. Every menu has a home and exit button.

The product developed is based on John L. Holland’s theory which suggests six occupational environments and six personality types as the basis for someone to make appropriate career planning. The occupational environments are: a. Realistic (R) with characteristics like realistic careers such as, mechanical machinery, production planning, building construction, or marine engineering. They prefer to work with tools or machines that technically have work procedures or use clear tools.

b. Investigative (I) with a characteristic of favoring investigative activities and solving cases, such as: researchers, economists, management analysis, anthropologists, and biochemists, individuals with this type usually have abilities in the fields of mathematics and scholarship. They enjoy working alone, and are happy to solve scientific problems. They like to work with ideas rather than with people or equipment in general.

c. Artistic (A) with characteristics like work that involves elements of beauty (aesthetics), such as: architects, graphic editors, script editors, songwriters, interior experts, and designers. Individuals in this type generally have skills in the field of art, happy to create something new, have a high imagination. This characteristic is described as an individual who is imaginative, intuitive, emotional, idealistic, and independent.

d. Social (S) has characteristics like social careers such as; teacher, psychologist, personnel, teacher, or other social worker. Individuals with this type usually have good socialization skills, are interested in building relationships with humans, and are happy to help others. This type tends to prefer work related to humans rather than with equipment. In general it can be described that individuals with this type are people who are friendly, warm, cooperative, friendly, sympathetic, patient, and caring.

e. Enterprising (E) likes an enterprise career, such as: marketing, financial planning, entrepreneurs, and lawyers. This type usually has good leadership skills and public speaking skills. They have the ability to influence others. Individuals of this type are portrayed as open, popular, social minded, confident, and ambitious.

f. Conventional (C) has characteristics like conventional careers, such as: accountants, accountants, shopkeepers, and organizational positions. Individuals of this type enjoy working with regularity. In general, this type is described as like practical things, leadership, orderly, efficient and careful.

**4. CONCLUSION**

Career guidance is important for high school students. High school students are faced with many career choices that must be decided based on their talents and interests. Thus the importance of preparing a career early so that after graduating from high school, students do not confuse in determining their career choices. Guidance and counseling guidance teachers can direct students through the giving of appropriate career information services so the career planning is achieved well. Career information is packaged in the form of an android application called mobile learning. One of the advantages of mobile learning is that it is equipped with attractive features so that career guidance information services become fun so it can foster and increase student motivation in finding career information that is in accordance with their talents and interests.

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