Android application development of exploration career based on Multiple Intelligence: A model hypothetical

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Abstract. The purpose of this study is to develop and design an android application of exploration career based on multiple intelligence that is used for high school students to provide information exploration career based on multiple intelligence. Data collection is done to find out the problems faced and to design solutions. The techniques for collecting data through literature studies. Exploration career based on multiple intelligence itself is a form of individual effort to find, obtain and manage various kinds of appropriate career information based on consideration of the intelligence possessed by each individual. Intelligence is the ability possessed by someone who includes knowledge, skills and expertise in solving problems. Basically, each individual is unique and has some intelligence such as linguistic, logical-mathematical, visual-spatial, kinaesthetic, interpersonal, intrapersonal, musical, and naturalist intelligence. By understanding that each individual is born and has different types of intelligence, here the author is interested in developing an android application about exploration of careers based on multiple intelligence.- This android application will provide an interesting description and design while at the same time helping individuals, especially high school students, in understanding the intelligence they have with the right career for their future, so it is expected that the development of this android application can provide a good understanding to each individual especially in understanding their career in accordance with their intelligence.

Keywords: Android Application, Exploration Career, Multiple Intelligence, Education

1. Introduction

The selection and preparation of oneself towards a job or career is the preparation of adolescents before entering the world of work and is the task of adolescent development. Adolescents should ideally choose a job that is in accordance with their potential. The potentials included include knowledge of skills, creativity, abilities and attitudes towards work. The decision making about the chosen career must be integrated between the desired work and career with the personal potentials that are owned.

A very important aspect to be developed in relation to efforts to help individuals develop optimally is the career aspect, namely the ability to understand themselves, about the world of work, plan for the future in accordance with the expected life form, determine and make the right decisions and be responsible, so they are able manifest themselves meaningfully [1]. Pressure felt by adolescents in everyday life can affect various aspects of life, the way individuals make decisions will affect the way
they make career decisions in the future and can lead to long-term negative consequences for the future of vocational, psychological well-being, health, and social acceptance [2].

In this context, guidance and counseling services help students to understand, accept, direct, make decisions, and realize their decisions responsibly so as to achieve success, prosperity and happiness in their lives. In addition, guidance and counseling helps students / counselees in choosing, reaching and maintaining careers to realize a productive and prosperous life. Guidance and counseling development can also be interpreted as perspectives, approaches in guidance and counseling that are based on developmental theories and aim at developing individuals towards optimal development in a supportive development environment [3]. In accordance with the direction and spirit of Curriculum 2013, the paradigm of guidance and counseling considers that every student/counselee has the potential to develop optimally.

The skills of guidance and counseling teachers in providing guidance and counseling services also need to get full attention, thus making the process of guidance and counseling services more meaningful. However, there are still many obstacles or problems in carrying out the learning process and guidance and counseling services in schools, one of which is the discovery of some students who have not understood information about career exploration based on multiple intelligence.

The above is supported by the results of questionnaires that have been distributed in class VIII of Muhammadiyah Middle School 1 Kalasan with a total of 15 students, that the items are the most chosen and needed for students and have the highest score in the questionnaire, namely item number 20, information about career exploration. And departing from reality on the ground that the 2017 Work Employment and Social Outlook Trend predicts the number of unemployed people globally in 2018 is expected to reach 204 million with an additional increase of 2.7 million. Almost the same as the conditions experienced by western countries, Indonesia is also predicted to experience the same thing. Unemployment is still a challenge and even tends to be a threat. Indonesia's open unemployment rate in February 2017 was 5.33% or 7.01 million people out of a total of 131.55 million people in the workforce [4].

The rapid development of Information and Communication Technology (ICT) has affected various fields of life and even become something familiar to the public. At present, Information and Communication Technology (ICT) plays an important role both in the fields of education, economy, social, culture, religion, and also various other fields. In the field of education, this development has changed the way people learn, obtain various information, and in interpreting information. As is known, education is a learning process to develop the potential, skills and personal characteristics of students through conscious and planned effort. The same is true of the world of guidance and counseling. It is understandable that guidance and counseling is an activity that involves a BK teacher or counselor in an effort to empower students [5].

In the process of guidance and counseling, the counselor facilitates counselees to realize themselves, explore aspects in themselves, as well as aspects in exploring careers that are in accordance with their interests and talents and the possibilities of choices that are open. In addition, the guidance and counseling process is a process of communication in which a media is needed. So as the development of technology was born the concept of e-learning. E-learning is the concept of learning by using electronic circuits to convey the contents of learning or guidance. However, the concept of e-learning began to expand and develop into m-learning. M-learning stands for mobile learning. This creation begins with adapting e-learning and is designed to be simpler to answer the shortcomings found in e-learning. In developing mobile learning, one of them is by using a smartphone with the Android operating system. Android is one of the operating systems for Linux-based mobile devices [6].

According to news reported by Sindonews.com [7] the latest research conducted by Cambridge International through the 2018 Global Education Census shows that Indonesian students are the most technologically literate in the world, a position that can only be rivaled by US students. The study revealed Indonesian students were the highest technology users in the world in the field of education. The census conducted by Cambridge International, which is part of Cambridge University, examines
school life around the world for students 12–19 years old. In Indonesia, they survey 502 students and 637 students and more than two-thirds of Indonesian students (67%) use smart phones in class. Therefore the development of android application-based media in guidance and counseling services, especially aspects of exploration career based on multiple intelligence, is an opportunity for counseling teachers to provide good and correct information services to students. Based on the explanation, it can be concluded that researchers are interested in developing media exploration career based on multiple intelligence, in the form of an android application. So it is expected that from the development of android applications exploration career based on multiple intelligence can make students better understand information about good and true dual intelligence-based career exploration. The purpose of this study was to develop an android application about career exploration based on multiple intelligences.

2. Method

The method used is Research and Development. This research doing in several stages. In this study, we are still in the stage of the design and concept. Then, after making the design and concept, we will resume at the stage where our application development using an application android studio to create applications. Then we do early trials and mass trials continue.

From this study is based on a review of literature which is obtained from journals, books and some other literature. In addition, we conducted an analysis of data collected from the literature. From here look for a correlation between every aspect and indicators.

2.1 Exploration Career

Greenhaus & Callanan [8] states that career exploration is an effort as a collection of information about self and knowledge about the environment, with the aim of fostering progress and career development. The same thing was expressed by Cornell [9] that career exploration is a continuous process that requires the collection of self information and information about careers. Whether individuals are just starting to think about careers, or have good ideas about individual goals, make sure the individual is involved in self-assessment, career research, and experience that improves skills and builds up individuals based on their strength.

The same thing was expressed by Suherman [10] that career exploration is defined as the desire of individuals to explore or search for information on career information sources. The same thing was expressed by Sharf [10] that career exploration is a time when individuals strive so that they have more understanding especially about job information, career alternatives, career choices and starting work. This aspect includes the following indicators: 1) trying to explore and search for career information from various sources (BK teachers, parents, successful people, etc.); 2) have knowledge about self-potential, including talent, interest, intelligence, personality, values and achievements; 3) have enough career information.

Purwanta [11] also reinforces that career exploration is an activity that has a specific goal directed as an effort to increase the knowledge of each individual and the surrounding environment in the hope that individuals can spur career development. Career exploration is also oriented to providing information about yourself, such as values, interests and talents, such as providing information about various aspects of one's environment, such as work, work organizations, and family [8].

Based on the explanation above, it can be concluded that career exploration is an individual effort to find, obtain and manage various kinds of appropriate career information, so that individuals are able to plan their careers well while building greater individual awareness regarding various kinds of career information.

Career exploration is oriented to helping individuals develop greater awareness of themselves and their environment so that they can set realistic career goals and prepare for career changes and face disruptions whenever they occur [8]. The need to prepare and adapt to the rapid changes in working conditions is very important in managing a career "without limits". Priyatno [12] also states the function of career exploration, namely to find out interests, talents, abilities, strengths and weaknesses,
and to plan activities that support individual careers to be able to consider career planning in accordance with the needs related to the career to be chosen in the future.

The above explains that career exploration has a goal as an effort to help individuals develop awareness of their talents, interests and potentials and their environment so that individuals can set appropriate career goals while being able to manage various challenges in career change in the future.

2.2 Multiple Intelligence

Intelligence is essentially a basic ability that is general in nature to obtain a skill that contains various components [13]. Many theories that develop about intelligence or intelligence. Intelligence is formed when brain structure and function growth reaches the highest stage. This condition occurs during the first 12 years. During the time span of 0-3 years and 6-9 years is the largest condition the number of formation of connection paths that are likely to lose the connection path and the possibility of loss of the pathway to the nervous system [14]. Connections that produce good or positive perceptions in harmony with the values of intelligence that must be formed as much as possible. Conversely the connection of nerve cells that produce bad perceptions must be prevented and decided if it has happened.

David Weschler provides a formula for intelligence as a general capacity of individuals to act, think rationally and interact with the environment effectively [15]. According to some theories, intelligence or intelligence is related to the way individuals do, whether acting in a way that is smart or less intelligent or not smart at all. A smart deed is characterized by fast and appropriate actions. Quick and precise in understanding a problem, drawing conclusions and making decisions or actions. Actually, even today experts seem to still have difficulty finding a comprehensive formula for intelligence. Anita E. Woolfolk argues that according to the old theory, intelligence includes three senses, namely:

a. Ability to learn.
b. Overall knowledge obtained; and
c. The ability to adapt to new situations or the environment in general

But we will focus on the theory of multiple intelligence. The dual intelligence theory that has been developed over the past fifteen years by psychologist Howard Gardner challenges the old reality of intelligent meaning. Gardner argues that our culture has focused too much on verbal and logical thinking, abilities that are typically assessed in intelligence tests, and overriding other knowledge. He stated that there are at least seven intelligences that ought to be taken into account seriously as important ways of thinking [16]. Seven types of intelligence are:

2.2.1. Linguistic Intelligence. Linguistic Intelligence is intelligence in processing words. It is said in Armstrong that linguistic intelligence is "The capacity to use words effectively, whether orally or in writing". That is a capacity to use words effectively, whether oral or written. This is intelligence journalists, storytellers, poets and lawyers. Smart people in this field can argue, convince people, entertain, and teach effectively through the words they say. They like to play with the sounds of language through word puzzles, word games, and tongue twisters. Sometimes they are also proficient in small things, because they are able to remember various facts. In addition they also love reading, can write clearly and can interpret the language of writing widely. And intelligence is often referred to as verbal intelligence. While children or students who have this intelligence, are generally characterized by pleasure in activities related to the use of a language such as reading, writing essays, making poems, composing aphorisms, and so on. Children like this also tend to have strong memory. He tends to be easier to learn by listening and verbalizing [17].

2.2.2. Logical-Mathematical Intelligence. Logical-mathematical intelligence is related to reason and mathematics. Logical-mathematical intelligence deals with and includes scientific abilities. According to Gardner in Hoerr Logical-mathematical intelligence (logical-mathematical intelligence)
is "the ability to handle chains of reasoning and to recognize patterns and orders " [18]. That is the ability to handle events / reasons that are chain / related and respect patterns and order.

2.2.3. Spatial Intelligence. Spatial intelligence is the third type of intelligence, including thinking in images, and the ability to absorb, change, and recreate various aspects of the visual-spatial world. This intelligence is the intelligence of architects, photographers, artists, pilots, and mechanical engineers. [19]. The ability to imagine a real form and then solve various problems with respect to this ability is prominent in this type of visual-spatial intelligence. This spatial intelligence is characterized, among others by:

1) Provide a clear visual picture when explaining something.
2) Easy to read maps or diagrams.
3) Draw the person or object exactly the original
4) Nice to see movies, slides, photos or other artwork.
5) Really enjoy visual activities, such as puzzles or the like.
6) Daydreaming and fantasizing
7) Scribbling on paper or school assignment books.
8) Understand information through images rather than words or descriptions.
9) Prominent in art subjects.

2.2.4. Musical Intelligence. Musical intelligence is the fourth type of intelligence. The main characteristic of this intelligence is the ability to absorb, appreciate, and create rhythms and melodies. Musical intelligence is possessed by people who are sensitive to tone, can sing songs appropriately, can follow the rhythm of music, and who listen to various musical works with a certain level of sharpness. They are also easier to remember things and express ideas when associated with music. Musical intelligence has characteristics, including:

1) Like playing a musical instrument at home or at school.
2) Easy to remember the melody of a song.
3) More able to learn with musical accompaniment.
4) Sing or hum to yourself or others.
5) Easily follow the rhythm of the music.
6) Having a good voice for singing.
7) Good achievement in music subjects.

2.2.5. Physical-Kinesthetic Intelligence. Physical-kinesthetic intelligence is physical intelligence which includes talent in controlling body movements and skills in handling objects. Athletes, craftsmen, mechanics, and surgeons have high levels of physical kinesthetic intelligence. They are dexterous people, the senses are very sensitive, cannot remain silent, and are interested in everything.

2.2.6. Interpersonal Intelligence. Inter-personal intelligence (inter-personal) is the ability to understand and cooperate with others. This intelligence mainly requires the ability to absorb and respond to the moods, temperaments, intentions, and desires of others. People who have this type of intelligence like and enjoy working in groups (working groups), learning while interacting and working together, also often feel happy acting as mediators or mediator in disputes and disputes both at school and at home. Therefore, they can become excellent networkers, negotiators and teachers.

2.2.7. Intra-Personal Intelligence. The last intelligence is intra-personal intelligence or intelligence within oneself. People who are very good at intrapersonal intelligence can easily access their own feelings, distinguish various kinds of emotional states, and use their own understanding to enrich and guide their lives. Examples of people who have this intelligence, namely counselors, theologians, and entrepreneurs. Intra-personal or intra-personal intelligence has characteristics including:

1) Showing an independent attitude and strong will.
2) Work or study well by yourself.
3) Having high self-confidence.
4) Learn a lot from past mistakes.
5) Thinking focused and focused on achieving goals.
6) Many are involved in hobbies or projects that are done on their own.

3. Result and Discussion
Here is the structure of the android application development of exploration career based on multiple intelligence prototype model, which is a description of the flow of content from this a model hypothetical android application.

![Structure of Android Application Development Of Exploration Career Based on Multiple Intelligence](image)

**Figure 1.** Structure of Android Application Development Of Exploration Career Based on Multiple Intelligence

The dual intelligence theory that has been developed over the past fifteen years by psychologist Howard Gardner challenges the old reality of intelligent meaning. Gardner argues that our culture has focused too much on verbal and logical thinking, abilities that are typically assessed in intelligence tests, and overriding other knowledge. He stated that there are at least seven intelligences that ought to be taken into account seriously as important ways of thinking [16].

Cherry [20] stated that Gardner’s theory has come under criticism from both psychologists and educators. These critics argue that Gardner’s definition of intelligence is too broad and that his eight different “intelligences” simply represent talents, personality traits, and abilities. Gardner’s theory also suffers from a lack of supporting empirical research.

Despite this, the theory of multiple intelligences enjoys considerable popularity with educators. Many teachers utilize multiple intelligences in their teaching philosophies and work to integrate Gardner’s theory into the classroom. The following is the content or information that will be present in this android application, as well as the type of intelligence, characteristics of the type of intelligence and potential career choices.
| No | Type of Multiple Intelligence | Characteristics | Potential Career Choices |
|----|-------------------------------|-----------------|-------------------------|
| 1  | Linguistic Intelligence       | 1. Good at remembering written and spoken information | 1. Writer/journalist  
2. Lawyer  
3. Teacher |
|    |                               | 2. Enjoys reading and writing | |
|    |                               | 3. Good at debating or giving persuasive speeches | |
|    |                               | 4. Able to explain things well | |
|    |                               | 5. Often uses humor when telling stories | |
| 2  | Logical-Mathematical Intelligence | 1. Excellent problem-solving skills | 1. Scientist  
2. Mathematician  
3. Computer programmer  
4. Engineer  
5. Accountant |
|    |                               | 2. Enjoys thinking about abstract ideas | |
|    |                               | 3. Likes conducting scientific experiments | |
|    |                               | 4. Good at solving complex computations | |
| 3  | Spatial Intelligence          | 1. Enjoys reading and writing | 1. Architect  
2. Artist  
3. Engineer |
|    |                               | 2. Good at putting puzzles together | |
|    |                               | 3. Good at interpreting pictures, graphs, and charts | |
|    |                               | 4. Enjoys drawing, painting, and the visual arts | |
|    |                               | 5. Recognizes patterns easily | |
| 4  | Musical Intelligence          | 1. Enjoys singing and playing musical instruments | 1. Musician  
2. Composer  
3. Singer  
4. Music teacher  
5. Conductor |
|    |                               | 2. Recognizes musical patterns and tones easily | |
|    |                               | 3. Good at remembering songs and melodies | |
|    |                               | 4. Rich understanding of musical structure, rhythm, and notes | |
| 5  | Physical-Kinesthetic Intelligence | 1. Good at dancing and sports | 1. Dancer  
2. Builder  
3. Sculptor  
4. Actor |
|    |                               | 2. Enjoys creating things with his or her hands | |
|    |                               | 3. Excellent physical coordination | |
|    |                               | 4. Tends to remember by doing, rather than hearing or seeing | |
Interpersonal Intelligence
1. Good at communicating verbally
2. Skilled at nonverbal communication
3. Sees situations from different perspectives
4. Creates positive relationships with others
5. Good at resolving conflict in groups

Psychologist
Philosopher
Counselor
Salesperson
Politician

Intra-Personal Intelligence
1. Good at analyzing his or her strengths and weaknesses
2. Enjoys analyzing theories and ideas
3. Excellent self-awareness
4. Clearly understands the basis for his or her own motivations and feelings

Philosopher
Writer
Theorist
Scientist

Figure 2. Content of Android Application Development of Exploration Career Based on Multiple Intelligences

This application has several features, including: info, tests, intelligence type and potential career choices. In this info section, students are given information about the application's objectives, benefits and seven related multiple intelligences they are looking for. Then the test piece, the part where there is a questionnaire filled out by students to find out the type of intelligence they have.

The results of student answers will be known when finished filling out the questions. Then career, where students are given work references here according to their personalities. Then the private part which is the relevant part of the student's profile which contains the name, age, gender, and goals and ideals to be achieved. From here, all plans are well prepared and prepared through this application.

With the development of the concept of multiple intelligences and with the acceptance of the theory in the world of education, inevitably educators need to help the development of children in a variety of plans, implementation, and evaluation programs that provide a container for the development of all types of their intelligence. This task becomes so important considering the development and manifestation of all types of intelligence is essential for children in overcoming problems in life, and obtaining life itself.

In the concept of MI, students' individual differences are accepted and served by a conviction based on Howard Gardner's assertion that "we are all so different because in essence we have different combinations of intelligence. If we realize this, at least we are more likely to be able to handle precisely the various problems we face in living in the world. The application of MI in education will cause educators to be wiser and able to appreciate and facilitate children's development.

In the world of education, the theory of multiple intelligences is starting to be accepted because it is considered to better serve all the intelligence that children have. The concept of MI makes educators more discerning about seeing differences, and makes children feel more welcomed and served. This concept "removes" the myths of smart and unintelligent children, because according to this concept, all children are essentially intelligent. It's just that the smart concept needs to be redefined with a new foundation [21]. Multiple intelligences and the way of learning and thinking contribute to the educational process in an integral way with teaching methodology [22].
So, based on explanation above we will developed this assessment tool using android application. The following is an illustration that we will develop about android application development of exploration career based on multiple intelligence.

![Figure 3. Introduce and General Question](image1)

![Figure 4. You will get some questions](image2)

![Figure 5. You will get the answer of your type intelligence](image3)

![Figure 6. You will get describe of your intelligence and potential career choices](image4)

Potential Career Choices:
- Architect
- Artist
- Engineer

Source: [http://bit.ly/TestofMultipleIntelligences](http://bit.ly/TestofMultipleIntelligences)

This research is still in the early stages of design and concept, so what we are doing now is developing and strengthening the concept of exploration of career based on multiple intelligence as the basis for making applications. It is hoped that when this application can be used, guidance and counseling teachers or school counselors can provide services to students optimally especially in exploration of career based on multiple intelligence.

Based on the results above, we will continue to develop applications that will help students explore careers based on multiple intelligence. This application can be expected as an effective medium, especially for the implementation of guidance and counseling services. Thus, students will be easier in determining the exploration of their career based on their intelligence. Suggestions and recommendations that will be obtained by students from this application will help students in determining the initial steps of their future, especially in terms of careers.

4. Conclusion
In conclusion, the research android applications development of exploration career based on multiple intelligence is important for students. So that it can be a solution for students when they will determine the potential of future career choices, and can plan, consider and determine their career better. For further researchers, the need to create applications to determine the initial form and use of applications in the community. Of course, it is necessary to pay attention to various things such as time of manufacture, material resources, and patented models. Thus, for further research when the application has an initial form, it is expected to test experts and mass trials. From the trial, it will be determined how effective the application has been made before.

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