

Quartet cards as the media of career exploration for lower-grade primary school students

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Abstract

A career developed through the optimization of one's potentials will irrevocably play a role in the development of self-identity as well as the psychological well-being of the individual. When children are introduced and allowed to explore as many career options as possible during their developmental stage, they are more likely to have a fruitful career development in the future. The preceding study showed that the career interests and knowledge of lower-grade primary students fit the Holland Career Categories: realistic, investigative, artistic, social, enterprising, and conventional (RIASEC). It was also found that the students' career interest and knowledge levels varied, with most in the low level. This second-year study aims to expand the results of the previous study by developing the use of Quartet cards as the media of career exploration for lower-grade primary students. By using the research and development method, this study develops Quartet Career Cards into three difficulty levels: low, medium, and high. The Quartet cards media have undergone feasibility tests conducted by experts in theory and media, as well as a series of field testing consisting of preliminary, main, and operational stages among a total of 266 primary students of grades 1, 2, and 3. A revision was made on several components including the images, information, colors, font sizes, illustration styles, and card sizes. The findings show that Quartet Career Cards meet the feasibility standards for the media of career exploration.

Keywords: *career exploration, Quartet Career Cards, lower-grade primary school students*

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Introduction

Working, or having a career, is one of the major life tasks that affect the psychological wellness of an individual (Sweeney, 2009, p. 17). In relation to the development of psychological wellness studies, Myers, Sweeney, and Witmer (2000) mention that work is one of the factors that determine the well-being of one's mental health. They also imply that although statistically there is no direct correlation between them, the factor analysis result

shows that career or having a job is fundamental to the acquisition of self-confidence in an individual. It is important that one can feel competent, esteemed, and belong to a positive identity in exploring his or her career options (Nauta, 2010, p. 12; Sweeney, 2009, p. 17).

Both career development and mental health play a role in helping an individual to achieve a more effective quality of life. Nauta (2010, p. 12), based on the Holland (1997) theory, states that an individual with a good understanding of his/her sense of self will

possess a crystalized vocational identity that allows him/her to explore his/her career options without difficulty. Such an individual will eventually be able to have a career that is sustained by competence, in addition to life satisfaction and an effective personality in his/her social life. This notion explains that a well-developed career relies on a good understanding of self-identity (in the context of realistic, investigative, artistic, social, enterprising, and conventional/RIASEC personality types), by which an individual will be able to determine his/her career direction. For this reason, it can be understood that the knowledge acquisition on career options in the early development stage is imperative to the improvement of quality of life during adulthood.

However, in reality, making a career decision can be a challenge. In addition to the limited jobs available in the market, competence, qualification, and interest also play an important role in what career a person may have. A survey conducted by the Organization for Economic Cooperation and Development (OECD & Asian Development Bank, 2015) shows that 6.2% of Indonesian population is unemployed. Although the number is slightly below the world's average unemployment (6.7%), it is relatively high when compared to other countries like Japan, the country with the lowest unemployment rate, where the number is twice less than Indonesia with 3.4%. Following Japan, the second, third, and fourth place are India, South Korea, and also China, respectively. These are the countries with rapid economic growth dominating the global market, and therefore, are able to create more jobs.

Career introduction is one of the factors affecting unemployment rates. On the other hand, job suitability and level of interest can also determine how long a person can last in his/her job. Oftenly, a person would quit a job in which they did well because the job does not fit his/her interest. In some instances, the lack of interest in the job could discourage workers to do their best. If this problem can be overcome, the number of people who quit or have no job can be reduced, resulting in a lower unemployment rate.

Funded by the Islamic Development Bank, the first, second, and third authors conducted a study in 2015 on the career development among lowergrade primary students as an effort to nurture career development among individuals from the early age. The first-year study was a preliminary research aimed at examining whether the lower-grade primary students in the *Daerah Istimewa* Yogyakarta (DIY), had acquired the adequate levels of knowledge and interest on various types of occupations. The six Holland's career categories comprising Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC) were used as a reference in measuring the levels of knowledge and interest among the subjects as they had been proven to possess a high reliability level in numerous settings (Nauta, 2010, pp. 17–18). The study found that the knowledge and interest levels of the students were in accordance with the theory of career interest by Holland, although they were varied from high to low. It was then concluded that the students needed additional support to explore and learn as many career options as possible. As a follow-up of the previous study, this second-year research focuses on the development of learning aid or media that aims to improve the lower-grade primary students' knowledge of various types of occupations.

One of the challenges in the previous study was how to make the students interested in the learning activities aimed at stimulating their knowledge acquisition of career options, especially as there were several jobs that they were not familiar with, which were understandably more difficult to comprehend due to the more complex nature of the jobs. Therefore, it is important that an appropriate and suitable media for lower-grade primary students be created to improve their career knowledge acquisition in a broader scale, at least within the proximal development zone.

Nowadays, the options for learning media development are endless, especially with the rapid development of technology. The opportunity to develop online-based media by using smartphone application is widely open and oftenly preferable, as it offers a quick and affordable access, allowing children to inde-

pendently use it at any time, in any place. Both computer and smartphone applications are fun and easy to use and produce. Nevertheless, it needs to be pointed out that advanced technology does not always have a good impact on children, especially when it comes to social interaction with their peers. Interaction is one of the most important elements in the cognitive, affective, and psychomotor development in children. According to a number of theorists, the interaction and relationship among children and their peers are just as crucial as those between children and their parents, in spite of the difference in quality and values (Piaget, 1965, in Sigelman and Rider, 2006, p. 408). While parents act as the authoritative figures in a child's life, children can learn to learn, respect each other, negotiate, and practice cooperative team-work with their peers as they have equal position and power. Piaget further emphasizes that peers have a distinct contribution to children development that parents cannot provide.

Based on the two points above, it must be acknowledged that there is a direct need for a learning media hardware that stimulates children's social interaction with their peers. One convenient example is the playing cards Quartets. Quartet is a game originated from the Netherlands used by children to learn words. However, in its development, the game has been greatly modified for numerous purposes. In the same vein, this study develops the Quartet playing cards to improve children's knowledge of career options. Thus, this study aims to (1) develop and (2) examine the feasibility of the Quartet playing cards as the media for improving the career knowledge acquisition of lower-grade primary students.

Career introduction and awareness in the early age are incredibly crucial for future career development. Knight (2015) states that introducing career options and information on tertiary education earlier in primary school can help students realize the important connection between education and vocational success for their future. This means that introducing career knowledge to primary students as early as they are at the lower grades would contribute to their success in the future.

The deliberate decision to use a game of playing cards as learning media was made to address the research subjects, i.e. early primary students who are still in the playing period. Among other educational toys for children such as puzzles, crossword puzzles, cards, pictures, movies and videos, and also interactive CDs, Quartet playing cards were chosen for several reasons.

The game is programmed to be played repeatedly and to engage children in a fun learning activity through the use of pictures to show various occupation types in the cards. This mechanism is designed in order to address the instrumental conditioning learning theory on how repeated activities can form a strong stimuli-response (S-R) connection, especially those involving emotion or happy feeling, where the stimuli tend to transform into a long-term memory (Santrock, 2008). This is supported by Garris, Ahlers, and Driskell (2002) who state that using toys or involving an element of fantasy in the learning activities allows students to feel more excited in the class.

Method

The activities in this second-year study involved developing a research product and conducting feasibility tests on the product. The process of developing the Quartet playing cards as the media of career exploration referred to ten-step research and development method proposed by Borg and Gall (1983), consisting of (1) research and information collection; (2) planning; (3) preliminary product form development; (4) preliminary field testing; (5) main product revision; (6) main field testing; (7) operational product revision; (8) operational field testing; (9) final product revision; and (10) dissemination and implementation. This second-year study adopted only the second to ninth steps, as the first step had been completed in the preceding study, while the final step is planned to be conducted in the third year.

The research instrument for data collection was a test resulted from the previous year's study (Ayriza, Setiawati, & Triyanto, 2016). The test was constructed according to the six Holland's Career Categories, i.e. realis-

tic, social, enterprising, and also conventional (RIASEC). There were a total of 60 items with each dimension containing 10 items.

Subsequently, the instrument underwent expert and construct validation. Two experts were involved in this study: an expert who has an extensive research experience in career development study; and an expert in primary school education. The expert on career development suggested that there were more varied alternative answer options for the test items, and to avoid similar answer alternatives/options for different statements. On the other hand, the expert on primary education found no significant problem except for the use of some technical terms. Once the test was revised based on the validators' advice, a construct validation was conducted by analyzing the six dimensions individually using the confirmatory factor analysis (CFA). The result shows that all test items in the dimensions refer to one factor. Each dimension was considered valid or significant if it had the Chi square probability of ($\chi^2 > 0.05$), as well as Root Mean Square Error of Approximation (RMSEA) or the average size of the expected difference per degree of freedom (df) in the population of less than 0.08.

The result of CFA is presented in Table 1. According to the table, each dimension of

RIASEC corresponds to each latent variable and leans to one factor, meaning that it fulfills the requirement for construct validity. Meanwhile, instrument's reliability was tested using Alpha Cronbach formula and the result of reliability coefficient is 0.891.

Subjects

The population of this study was the lower-grade students of primary schools in *Daerah Istimewa* Yogyakarta (Special Regions of Yogyakarta), which consist of four regencies and one municipality. The cluster random sampling technique was used to establish the sample. Cluster referred to the regencies or municipality which have different characteristics, and random referred to the technique used in selecting both the schools from the selected regencies and municipality, and the classes of the selected schools.

The research subjects were 266 primary school students of grade 1, 2, and 3. The numbers of students undergoing preliminary field testing, main field testing, and operational field testing were 12, 83, and 171 students, respectively. Details of the number and classification of the subjects are presented in Table 2.

Table 1. The result of the confirmatory factor analysis

Statistics	Dimensions					
	R	I	A	S	E	C
χ^2	34.03	35.30	16.04	41.49	34.97	39.44
df	26	26	15	29	27	32
significance (p)	0.13436	0.10535	0.26074	0.06235	0.13960	0.17136
RMSEA	0.023	0.025	0.019	0.027	0.023	0.020
Result	Fit	Fit	Fit	Fit	Fit	Fit

Table 2. The number of subjects in each field testing

Preliminary field testing	Primary school	SDN Samirono (Kota)					
	Grade	Grade 1		Grade 2		Grade 3	
	Total	4		4		4	
Main field testing	Primary school	SDN Karangmojo II (Gunungkidul)					
	Grade	Grade 1		Grade 2		Grade 3	
	Total	27		30		26	
Operational field testing	Primary school	SDN Kotagede (Kota)		SDN Sonosewu (Bantul)		SDIT Tunas Mulya (Gunungkidul)	
	Grade	Grade 1	Grade 2	Grade 2	Grade 3	Grade 1	Grade 3
	Total	29	27	30	23	30	32

Data Analysis Technique

The descriptive quantitative analysis technique was employed in this study. In addition, feedback and suggestions from the teachers and research assistants who were in charge of guiding and monitoring the field testing were compiled as a part of the qualitative data used as additional references to improve the research product.

Findings and Discussion

Findings

This section illustrates the findings of the current study which are based on the second to ninth step of Borg and Gall's ten-step R and D method. A brief summary of the finding of the first-year study is provided to give a comprehensive depiction of the study.

The first stage, research and information collection, shows that the career knowledge and interest of the subjects fit Holland's RIASEC construct theory. The second-year research is a follow-up of the previous study's findings.

The planning stage is manifested in developing the concept of Quartet playing cards based on Holland's RIASEC theory. At the top of the card, the word for the type of occupation is made bigger and bolder, while a description of the occupation is provided at the bottom. The cards are grouped into three volumes based on the difficulty levels (low, medium, and high), and four categories, i.e. task, tool, workplace/product/service, and working attire or attribute.

The stage of developing preliminary product form involves creating the product prototype as designed in the previous stage, and

conducting feasibility test on it. Validity tests were performed by a professor with an extensive research on career development, and a Ph.D scholar on primary education, with the following results: (a) Several adjustments were made on the pictures, the size of the cards to fit the size of a child's palm, and on the thickness of the material to ensure the cards' durability; (b) adjustments were made on the measurement of the career knowledge instrument.

The next stage is the preliminary field testing. In this stage, four students of SDN Samirono (Yogyakarta) were randomly selected from each grade, making a total of 12 subjects. The result of the limited field testing is presented in Table 3.

Table 3 reveals that most of the first graders (75%) are able to play the game, find it easy to play, and will play it at home, while all second and third graders (100%) have no problem and respond positively to all of the test items. All subjects from the three grades (100%) agree that the playing card helps them learn many types of occupations and enjoys playing the game. However, about 25% of the first graders still have difficulty in playing the game, find it hard to play, and will not consider playing it at home. In addition, the minority also does not find it easy to learn the characteristics of the occupations. Unlike the second and third graders, the first graders show more enthusiasm for obtaining the goal of the Quartet Career Cards as learning media. Additionally, during the limited field testing, the research team received feedback and suggestions from the teachers and research assistants, including to make the font size bigger, the colors brighter, as well as adjustment on the pictures to reflect the geographical condition of where the students live.

Table 3. The result of limited field testing

Primary school	SDN Samirono			Mean
	Grade 1	Grade 2	Grade 3	
Grade	Grade 1	Grade 2	Grade 3	
Subjects	4 students	4 students	4 students	
Able to play the game	75%	100%	100%	92%
Find the game easy to play	75%	100%	100%	92%
Will play at home	75%	100%	100%	92%
Learn many types of occupations	100%	100%	100%	92%
Learn the characteristics of the occupations	75%	100%	100%	92%
Enjoy the game	100%	75%	100%	92%

In the next stage, the research team conducted revision to the main product based on the recommendation and feedback from the students and teachers in stage four. The result of the revision was the final draft of main product that was ready for the main field testing.

The main field testing was conducted in the same mechanism as the preliminary field testing in stage four, but with larger subjects. There were 27 grade 1 students, 30 grade 2 students, and 26 grade 3 students of SDN Karangmojo Gunungkidul. The data are presented in Table 4.

As illustrated in Table 4, the results of extended main field testing are varied among students of grade 1, 2, and 3. Nearly all of the students (90%) are able to play the Quartet Career Cards game and find it easy to play. About the same number (94%) of students will play the game at home, and manage to learn the types (92%) and also characteristics (94%) of the occupations from playing it. On average, there are 99% of students who enjoy playing the game. Overall, 93% of the students achieve the goal of playing the game, as targeted by the research team.

In the next stage, operational product revision was made according to the feedback

and suggestions of the subjects during the extended main field testing, particularly on the colors in the type of occupation and the answer choice. Moreover, the colors in the low, medium, and high levels were changed into red, blue, and green, respectively. Once the revision was made, it was concluded that the developed learning media was ready for operational field testing.

The operational field testing was done in one primary school in the municipality of Yogyakarta, and two other schools in the DIY regencies. They were SD Kotagede (Municipality of Yogyakarta) with 29 first graders and 27 second graders; SD Sonosewu (Bantul Regency) with 30 second graders and 23 third graders; and SDIT Tunas Mulia (Gunungkidul Regency) with 30 first graders and 32 third graders. The result is presented in Table 5.

Table 5 shows that the data obtained from operational field testing are varied. In general, the first grade students of the three schools are able to play the game (90%), find the game easy to play (91.5%), will play the game at home (91.5%), learn many types (83%) and characteristics (76.5%) of the occupations, and enjoy the game (95%). On the other hand, 85% second graders are able to play the game and find the game easy to play,

Table 4. The result of extended main field testing

Primary school	SDN Karangmojo II			Mean
	Grade 1	Grade 2	Grade 3	
Grade	Grade 1	Grade 2	Grade 3	
Subjects	27 students	30 students	26 students	
Able to play the game	89%	90%	92%	90%
Find the game easy to play	89%	90%	92%	90%
Will play at home	100%	87%	96%	94%
Learn many types of occupations	100%	77%	100%	92%
Learn the characteristics of the occupations	100%	87%	96%	94%
Enjoy the game	100%	97%	100%	99%

Table 5. The result of operational field testing

Primary school	SDN Kotagede 1		SDN Sonosewu		SDIT Tunas Mulia		Mean
	29	27	30	23	30	32	
Subjects	29	27	30	23	30	32	
Grade	1	2	2	3	1	3	
Able to play the game	83%	89%	81%	100%	97%	91%	90%
Find the game easy to play	86%	89%	81%	100%	97%	91%	91%
Will play at home	90%	100%	97%	100%	93%	97%	96%
Learn many types of occupations	86%	96%	100%	100%	80%	97%	93%
Learn the characteristics of the occupations	83%	93%	97%	100%	70%	100%	91%
Enjoy the game	90%	93%	100%	100%	100%	100%	97%

99% will play the game at home, 98% learn many types of occupations, 95% learn the characteristics, and 97% enjoy the game. Finally, among grade 3 students, 95.5% students are able to play the game and find it easy to play, 98.5% will play it at home and learn about many types of occupations, while 100% students both learn the characteristics and enjoy the game.

The operational field testing reveals that grade 3 students have the highest achievement of the research goal (98%), followed by the second graders (93%), and the first graders (88%). On average, there are 93% lower-grade primary school students who achieve the goal of Quartet Card Careers as targeted by the research team.

The ninth and final stage in this research was final product revision. This stage resulted in a suitable final product of career exploration for children aimed at improving their career knowledge.

Discussion

This study is a follow up of the first-year study on the exploration of career interest and knowledge construct using quantitative analysis. The first-year study shows that both the career interest and knowledge of the lower-grade primary students in *Daerah Istimewa* Yogyakarta are society-oriented, and that they correspond well to Holland's theory of six career categories (RIASEC). The fact that students' career knowledge is society-oriented implies that their career interests are limited to the social scope, as well.

As a result, children's career development may be disrupted, especially when there is no intervention. Therefore, the second-year study was aimed at improving children's career knowledge based on Holland's RIASEC theory through Quartet Career Cards as the learning media specifically developed for that purpose.

The decision to conduct intervention on the lack of career knowledge among lower-grade primary students is based on the research by Xu, Hou, and Tracey (2014, p. 654) in China, which revealed that the lack of self-exploration and environment exploration was caused by the lack of information or knowl-

edge of exploring career options, as well as the lack of efforts or supporting facilities in the career exploration process. In that case, intervention is imperative to make improvements on the children's career knowledge.

The final product of the developed learning media in this study is modified Quartet cards containing pictures and information aimed at lower-grade primary students' career development. It is expected that students can acquire wider knowledge and develop their career interests, so that they are well-informed and ready to make a decision on their vocational preference when they grow up. In addition, the game is also intended to increase the players' interpersonal relationships and give them pleasure and enjoyment when playing it.

The notion is in line with the study of Garris et al. (2002) who state that games can be used as a part of learning activities to make students enjoy the learning process more due to the element of fantasy. Moreover, Parker and Lepper (1992) find that learning in an environment which involves an element of fantasy is more beneficial to students than one conducted in other conditions.

All field testing, whether preliminary, main, or operational, shows that more than 90% students are able to play Quartet Career Cards, find it easy to play, enjoy the game, and will play it again at home. The learning aspect of the game is aimed at helping students improve their career knowledge. This is evident in how students manage to learn more types of occupations, what the jobs entail, and the relevant tools, setting, attire or attributes required for particular jobs. For instance, they children learn that *caping* (a traditional wide cone-shaped hat made from bamboo) is an attribute associated with Indonesian farmers as they do not have special attires for their job.

On the other hand, the discussion on career exploration as early as primary school was in accordance with the study conducted by Magnuson and Starr (2000). They argue that making simple decisions during early childhood such as choosing what food to eat, toys to play, clothes to wear, or things to do in their daily lives will help the children have personal preferences. In the future, the preferences will manifest in the formation of in-

dividual autonomy that helps them to make decisions and life choices, including in determining what career they would have as an adult.

Based on Piaget's cognitive development theory, the lower-grade primary students are in the concrete operational stage, which is marked by how they are not dominated by perception and rely on experience to guide them, in addition to the extraordinary cognitive development and formative stage in the formal education setting (Schunk, 2012). The concrete operational stage includes the ability to classify, combine, and compare. In this stage, children are also able to understand the connection and to make sense of a series of events (Hill, 2012). The theory implies that as educators, teachers should be able to provide the appropriate learning style and environment according to the students' cognitive development so that students are encouraged to explore and actively participate in social interaction. In relation to learning environment, teachers are also responsible for giving new stimuli for students' cognitive construct to stimulate their development through assimilation and accommodation.

As learning media, the Quartet Career Cards allow the lower-grade primary students to explore a variety of possible career options for their future, as well as to engage in an active participation by interacting with their peers. As a result, the game acts as a stimulus for the environment that simultaneously constructs the children's cognitive structure with career knowledge. Taveira, Silva, Rodriguez, and Maia (1998, p. 90) emphasize the significance of early career exploration for children at the primary school age to support and foster the children's proper development.

Based on the research development, field testing, findings, discussion, relevant theories and previous studies, it can be concluded that the Quartet Career Card game is a contributing factor in children's career exploration process, as it can help improve the career knowledge of lower-grade primary students. This implies that Quartet Career Card can be recommended as media in career guidance activities to expand and enhance children's career knowledge.

Conclusion

The developing of the Quartet Career Cards game is aimed at supporting children's future career development by improving their knowledge on possible career options. While the product development process is based on Borg and Gall's (1983) ten-step model, the concept of the cards itself relies on Holland's theory of the six Career Categories, involving realistic, investigative, artistic, social, enterprising, and conventional.

The Quartet Career Cards consist of a picture and information on the types of occupations and each of their tasks, tools, workplace, products or services, as well as the attributes and work attires. There are three levels of difficulty ranging from high, medium, to low. The cards are proven suitable and feasible to be used by lower-grade primary students, based on a series of field testing, as well as validity tests conducted by theory and media experts.

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