

## Development of Instrumen Eksplorasi Karier Anne Roe (IEKAR) for Junior High School Students

(Pengembangan Instrumen Eksplorasi Karier Anne Roe (IEKAR) untuk Siswa Sekolah Menengah Pertama)

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**Abstract:** This study aims to develop a career exploration instrument based on Anne Roe's classification to help junior high school students explore their career options. The development method uses the Syaiffudin Azwar instrument development model with 8 stages, namely the identification of measuring objectives; measuring domain restrictions; operationalization of aspects; writing and reviewing items; language test; field tests; item selection and; final compilation. The field test was carried out on 306 junior high school students in the Godean area, Yogyakarta. The results of the CFA test show that all instrument items that make up the 8 career groups obtained fit results based on the p-value indicators of 0.257, RMSEA 0.15, GFI 0.87, AGFI 0.86, and CFI 1.00. CFASO test results obtained p-value 0.257 greater than 0.05 and RMSEA value 0.015 less than 0.05. In addition, the results of multidimensional reliability testing showed a score of 0.87 greater than 0.70. These findings indicate a valid and reliable instrument to help explore the careers of junior high school students.

**Keywords:** career exploration; guidance and counseling; Anne Roe classification

**Abstrak:** Penelitian ini bertujuan untuk mengembangkan instrumen eksplorasi karier berdasarkan klasifikasi Anne Roe guna membantu siswa sekolah menengah pertama mengeksplorasi pilihan kariernya. Metode pengembangan menggunakan model pengembangan instrumen Syaiffudin Azwar dengan delapan tahapan yakni: identifikasi tujuan ukur; pembatasan domain ukur; operasionalisasi aspek; penulisan dan *review* butir; uji coba bahasa; *field test*; seleksi butir; dan kompilasi final. *Field test* dilaksanakan terhadap 306 siswa sekolah menengah pertama di wilayah Godean, Yogyakarta, Indonesia. Hasil pengujian *CFA* menunjukkan seluruh butir instrumen yang membentuk delapan kelompok karier memperoleh hasil fit berdasarkan indikator p-value 0.257, RMSEA 0.15, GFI 0.87, AGFI 0.86, dan CFI 1.00. Pengujian *CFASO* menunjukkan p-value 0.257 lebih besar dari 0.05 dan nilai RMSEA 0.015 kurang dari 0.05. Selain itu, hasil pengujian reliabilitas multidimensional menunjukkan skor 0.87 lebih besar dari 0.70. Temuan ini menunjukkan instrumen valid dan reliabel untuk membantu eksplorasi karier siswa sekolah menengah pertama.

**Kata kunci:** eksplorasi karier; bimbingan dan konseling; klasifikasi Anne Roe

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## INTRODUCTION

Indonesia's national education long-term development plan targets the number of vocational high schools to have a ratio of 70:30 when compared to senior secondary schools by 2025. This policy of increasing the number of vocational high schools encourages junior high school students to prefer to enter vocational high schools with various options existing majors. Vocational high school students are expected to have practical skills and knowledge so that later they can be absorbed into the world of work more quickly (Baert et al., 2017). School counselors in junior high schools play an important role in providing appropriate career exploration services considering that new junior high school students are in the tentative stage (Tang, 2018; Trice & Greer, 2016).

Career exploration is defined as a way to gather information about oneself and one's environment (Ramdhan & Salim, 2020), with the aim of helping individual career development (Porfeli & Lee, 2012). Career exploration can be divided into self-exploration and environmental-exploration (Greenhaus et al., 2018; Jiang et al., 2019). Environmental exploration is related to individual efforts to obtain job information in the environment as material for making career decisions through interviews, searching for information online, and being directly involved in the world of work. Self-exploration focuses more on establishing and exploring self-interests, values, past experiences, and career goals. Self-exploration is more cognitive in nature and can be done through self-reflection, and fills out instruments that can help the career exploration process.

Student career development that begins with career exploration will make students know the career direction they want to go and how to achieve it (Stebleton & Diamond, 2018). Students are unique individuals so the way to explore careers to achieve success among students is certainly different. The use of instruments in career exploration acts as a self-assessment aimed at achieving knowledge and understanding of one's strengths and weaknesses (Antika et al., 2018). Career exploration assessments carried out through instruments will make students familiar with jobs that have not paid much attention to them, as well as jobs that have little interest in the world of work (Mallinson & Burns, 2019).

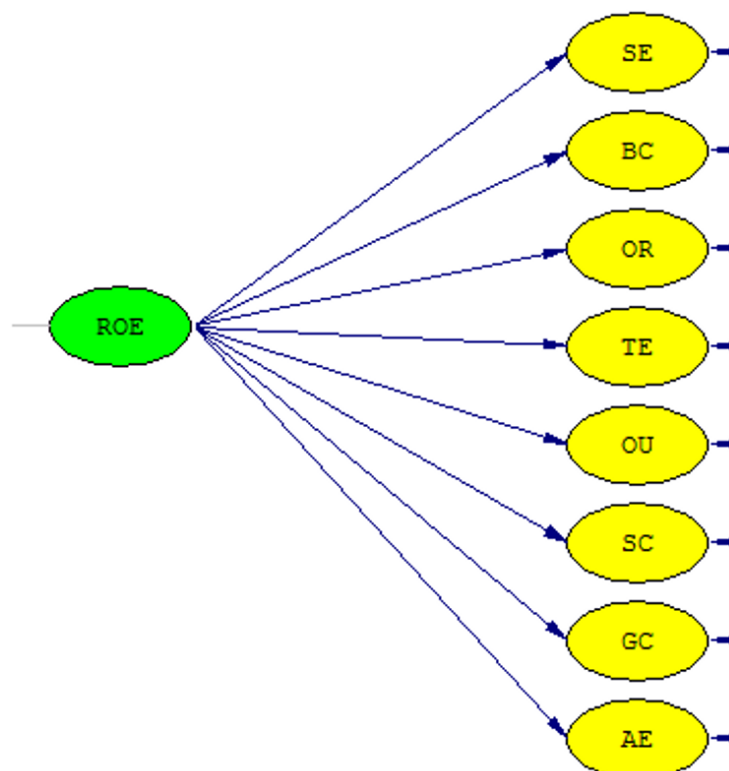
Many experts have tried to develop instruments that can assist the career exploration process, which are generally based on John Holland's Self Directed Search (Fu & Zhang, 2019; Wille et al., 2015). The instrument developed based on Holland's theory has the advantage of being able to capture the tendency of career choice using the RIASEC concept. However, the instrument developed based on Holland's theory is also not free from weaknesses. One of the drawbacks is that the instrument only measures career choice without measuring the degree of expertise required in a job.

Besides Holland, there is Anne Roe, with her thoughts on eight career groups and six skill levels (Roe, 1956; Švarcová et al., 2011). The eight career dimensions consist of: service, business contact, organization, technology, outdoor, science, general culture, art and entertainment. Meanwhile, the six levels of expertise consist of professional and managerial 1, professional and managerial 2, semi-professional and small business, skilled, semi-skilled and unskilled ((Roe, 1956; Švarcová et al., 2011). Roe's career theory is seen as able to answer the weaknesses of Holland's theory.

The career classification developed by Anne Roe has not received much attention from experts and has the potential to be developed further. The selection of Anne Roe's theory in the development of career exploration instruments is based on Anne Roe's very comprehensive classification of mapping the world of work, both vertically and horizontally. As for this research, there are several problem formulations, namely: what is the form of the statement of Anne Roe's career exploration instrument (*Instrumen Eksplorasi Karier Anne Roe (IEKAR)*); and how the construct validity and multidimensional reliability of the instrument. Ultimately, the aim of this research is to develop a career exploration instrument based on Anne Roe's classification that can help junior high school students explore their career options.

## METHOD

This study used an instrument development model by Azwar (2015) which includes: (1) identification of measurement objectives; (2) measuring domain restrictions; (3) operationalization of aspects; (4) writing and reviewing items; (5) language test; (6) field tests; (7) item selection; and (8) final compilation. The initial stage, the researcher determines the measurement objectives, in this case trying to develop an instrument that can help students explore careers using Anne Roe's theory. The researcher also conducted a measurement domain limitation which only developed the instrument using a career group. The instrument was developed using one aspect of Anne Roe's classification, namely eight career groups. The instrument construct consists of: (1) Service (SE); (2) Business Contact (BC); (3) Organization (OR); (4) Technology (TE); (5) Outdoors (OU); (6) Science (SC); (7) General Culture (GC) and; (8) Art and Entertainment (AE). The conceptual diagram of the instrument that forms the basis of the Confirmatory Factor Analysis (CFA) test is presented in Figure 1:



**Figure 1. Conceptual Diagram**

At the stage of operationalizing aspects and writing and reviewing items, the researcher develops items using a grid as presented in Table 1. The instrument that has been developed with various inputs from experts is then tested for readability in order to obtain input related to language editing that is easily understood by students. The language test was conducted on 30 students as subjects at Prambanan junior high school and the field test was carried out on 306 junior high school students in the Godean area, Yogyakarta, Indonesia as a sample. The number of samples for this field test has exceeded the standard required for Structural Equation Modeling analysis to be carried out, namely 100-200 people (Wolf et al., 2013). The data that has been obtained are then analyzed using SEM with Confirmatory Factor Analysis (CFA) and Confirmatory Factor Analysis Second Order (CFASO) methods with the help of LISREL version 9.10 program. Item indicators in CFA and CFASO are declared fit if they meet the criteria for  $p\text{-value} > 0.05$ ,  $RMSEA < 0.05$ ,  $GFI > 0.09$ ,  $AGFI > 0.09$ , and  $CFI > 0.09$  (Ghozali & Fuad, 2014). The instrument was also analyzed through McDonald's multidimensional reliability test. The standard set is  $> 0.70$  as a reliable instrument (Allen et al., 2019).

**Table 1. Instrument Grille**

| <b>Dimension</b>      | <b>Operational Aspects</b>  | <b>Item No.</b> |
|-----------------------|---|-----------------|
| Service               | Individual interest is very strong to always interact with others and try to provide services to meet the needs and welfare of others. In general, verbal skills are needed in this dimension of work.  | 1, 2, 3, 4      |
| Business Contact      | Individuals have a strong desire to build exploitative relationships with others. The pattern that is built is to influence other people to buy the goods, services or services it offers.  | 5, 6, 7, 8      |
| Organization          | Individual interest is very great to build a good working atmosphere in business, industry or government agencies. Personal relationships with co-workers, subordinates or the community are not a major concern. This is characterized by the dominance of superiors and demands obedience from their subordinates.  | 9, 10, 11, 12   |
| Technology            | Individuals have a tendency to make, care for and distribute goods/ living things using technology. Individuals are usually trained and received education appropriate to their work. They can be characterized by high quantitative and spatial abilities and low verbal abilities compared to other abilities.  | 13, 14, 15, 16  |
| Outdoors              | Individuals with outdoor work orientation are characterized by their interest in taking and processing materials that exist in nature. Physical activity is very dominant in this group.  | 17, 18, 19, 20  |
| Science               | Individuals have an interest in researching and developing science in all fields. Individuals in this group are characterized by high interest in science and lack of artistic interest.  | 21, 22, 23, 24  |
| General Culture       | Individuals have an interest in jobs in education, journalism, law and linguistics. Individuals need good verbal skills and emphasize a great interest in human relationships.  | 25, 26, 27, 28  |
| Art and Entertainment | Individuals have a great interest in activities that require special abilities in the creative arts, entertainment, or sports. Superiority is highly emphasized, on the other hand the need for intellectuality in general is not the main thing. In addition, individuals tend to try to display their inner abilities so that they can be seen and get praise from the public | 29, 30, 31, 32  |

## RESULTS

After the instrument was developed, field tests were then carried out on 306 junior high school students showing varied results on each dimension. The results of the field test that have been processed using CFA are presented in Table 2.

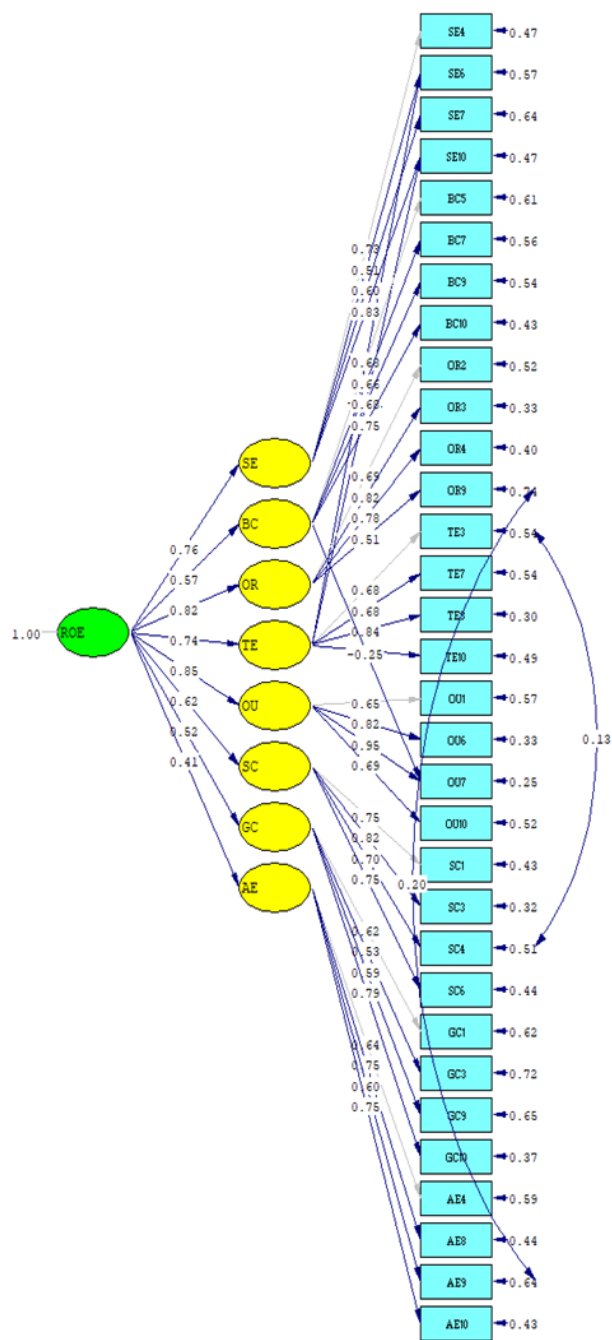
**Table 2. CFA Field Test Results**

| <b>Dimension</b>           | <b>p-V</b> | <b>RMSEA</b> | <b>AGFI</b> | <b>GFI</b> | <b>CFI</b> | <b>Decision</b> |
|----------------------------|------------|--------------|-------------|------------|------------|-----------------|
| Service (SE)               | 0.26       | 0.03         | 0.98        | 0.99       | 0.99       | Fit             |
| Business Contact (BC)      | 0.67       | 0.00         | 0.99        | 0.99       | 1.00       | Fit             |
| Organization (OR)          | 0.27       | 0.03         | 0.98        | 0.99       | 0.99       | Fit             |
| Technology (TE)            | 0.65       | 0.00         | 0.99        | 0.99       | 1.00       | Fit             |
| Outdoor (OU)               | 0.89       | 0.00         | 0.99        | 1.00       | 1.00       | Fit             |
| Science (SC)               | 0.84       | 0.00         | 0.99        | 0.99       | 1.00       | Fit             |
| General Culture (GC)       | 0.35       | 0.01         | 0.98        | 0.99       | 1.00       | Fit             |
| Art and Entertainment (AE) | 0.36       | 0.01         | 0.98        | 0.99       | 1.00       | Fit             |

All statement items that were tested on the dimensions of the career group have obtained fit results for each of the predetermined criteria. The data were then analyzed using Confirmatory Factor Analysis Second Order (CFASO) to test the construct validity of the developed instrument. CFASO test results data can be seen in Table 3.

Table 3. CFASO Field Test Results for the Anne Roe Construct

| Dimension                  | Loading Factor | p-V   | RMSEA | AGFI | GFI | CFI  |
|----------------------------|----------------|-------|-------|------|-----|------|
| Service (SE)               | 0.76           | 0.257 | 0.015 | 0.9  | 0.9 | 1.00 |
| Business Contact (BC)      | 0.57           |       |       |      |     |      |
| Organization (OR)          | 0.82           |       |       |      |     |      |
| Technology (TE)            | 0.74           |       |       |      |     |      |
| Outdoor (OU)               | 0.85           |       |       |      |     |      |
| Science (SC)               | 0.62           |       |       |      |     |      |
| General Culture (GC)       | 0.52           |       |       |      |     |      |
| Art and Entertainment (AE) | 0.41           |       |       |      |     |      |



Chi-Square=470.20, df=451, P-value=0.25705, RMSEA=0.015

Figure 2. Second Order Confirmatory Factor Analysis Test Diagram

Based on the test results, CFASO is known that most of the dimensions have a loading factor score  $> 0.50$  and the p-value indicators are 0.257, RMSEA 0.15, GFI 0.87, AGFI 0.86, and CFI 1.00 so that it can be considered significant. The estimated reliability of the instrument in this study was analyzed using McDonald's multidimensional reliability. The test results show a score of  $0.87 > 0.70$  so the instrument is declared reliable. The items of the internal instrument developed are presented in Table 3.

**Table 4. Anne Roe Career Exploration Instrument Items**

| Dimension             | Statement   |
|-----------------------|---|
| Service               | 1. Transport passengers from the pick-up point to their destination, such as Gojek and Grab drivers<br>2. Extinguishing a fire during a fire, like a firefighter<br>3. Cut hair, like barbers and salon workers<br>4. Delivering food and beverage orders, such as cafe waiters and restaurant waiters  |
| Business Contact      | 5. Selling cars or motorbikes, such as vehicle sales<br>6. Selling products online, such as online shop entrepreneurs, and online shop employees<br>7. Selling cookware products by practicing how to use them, such as a sales demonstrator<br>8. Promoting the advantages of a product to customers, such as company marketing and online store marketing             |
| Organization          | 9. Become a people's representative in the DPR (people's representative council) and make laws, like a member of the DPR<br>10. Leading a political party, like a party leader<br>11. Manage the areas they lead, such as governors, regents, and sub-district heads<br>12. Controlling a large company, such as a company Director                                     |
| Technology            | 13. Repair a broken computer, like a computer technician<br>14. Overcome power disturbances, such as PLN officers (state electricity company)<br>15. Repairing electronic equipment such as television, radio or refrigerator, such as an electronics technician<br>16. Maintain and repair motor vehicles, such as motorcycles or cars, such as automotive technicians |
| Outdoors              | 17. Catching fish in the sea or river, like a fisherman<br>18. Cutting wood in the forest, like a woodcutter<br>19. Making salt on the beach, like a salt farmer<br>20. Mining gold, coal, oil and other minerals, like miners  |
| Science               | 21. Applying medical science to heal the sick, like a doctor<br>22. Dispensing medicine, like a pharmacist<br>23. Doing research in a laboratory, like a laboratory technician<br>24. Manage the nutrition of food in the hospital, like a nutritionist   |
| General Culture       | 25. Writing news for newspapers and magazines, like a journalist<br>26. A radio or TV presenter, such as a radio or TV presenter<br>27. Commenting on the course of a football, badminton or basketball game, like a sports commentator<br>28. Looking for information about an event to make news, like a reporter   |
| Art and Entertainment | 29. Making batik patterns or local motifs, such as batik<br>30. Make beautiful writing, like calligrapher and flowerboard maker<br>31. Designing the layout of objects in a room, like an interior designer<br>32. Making paintings, like a painter   |

## DISCUSSION

Instrumen Eksplorasi Karier Anne Roe (Anne Roe's career exploration instrument) is designed to help students explore their career options, especially when it comes to majoring in vocational high schools. The fit instrument items consist of four statements on each dimension of the career group so that there are 32 statements. The balance in each dimension of the career group is designed so that there is a similarity in the potential selection of certain career dimensions.

The data from the construct validity test, using both CFA and CFASO, showed a fit result and was strengthened by McDonald's multidimensional reliability results. These two fundamental elements cannot be separated from each other in the development of a good instrument. Several studies have been conducted to test the construct validity using CFA as in the CPSI instrumen instrument (Fu & Zhang,

2019), ISEC (Meens et al., 2019), SKI (Rahman, 2019) and PVII (Nurchahyo et al., 2019). These studies show the importance of construct validity as an evaluation material for the instruments that have been developed.

The instrument construct was developed based on eight career groups and not correlated based on six skill levels. The eight career groups are: (1) Service (SE); (2) Business Contact (BC); (3) Organization (OR); (4) Technology (TE); (5) Outdoors (OU); (6) Science (SC); (7) General Culture (GC) and; (8) Art and Entertainment (AE). This is influenced by the factors of limited energy and thinking as well as consideration of the effectiveness of the work by students. Condensing the level of expertise without reducing its essence can be used as an alternative solution as developed in RAMAK (Meir & Barak, 1974) which uses three levels of expertise to obtain 72 statement items.

Most of the similar instruments that study using Anne Roe's theory are very old, that is, they were developed in the 1960s and 1990s. Anne Roe's greatest contributions are twofold, namely the job classification system and the theory of how personality development affects career choice (Brown, 2014). This is the main attraction for researchers to develop instruments using the construct of the instrument. Similar instruments are developed by Artosandi (2016) using Holland's theoretical construct. The instrument obtained the lowest factor loading 0.61 and the highest 0.89 with a construct reliability of 0.80. As a comparison, in this study, five of the eight instrument constructs of Anne Roe were able to get a score  $> 0.61$  and the reliability was  $> 0.80$ . This statistical test shows that the developed instrument is classified as good category. The instrument developed by Artosandi in this case has the advantage that comprehensive testing has been carried out on junior high school students and also vocational high school students to see an overview of their career choices. This finding becomes an interesting development suggestion in this research.

Another instrument model developed by Nurchahyo, et al. (2019) interesting to observe. The instrument was developed using Holland's theory, where the instrument items were converted into image stimuli. This is based on efforts to overcome the dependence on the reading ability of the respondents (Boerchi & Magnano, 2015). Related to the use of stimulus in the form of words such as those in this instrument, the researcher targets students who are the subjects of the study to be students in school, especially at the junior high school level. At that time, it is certain that students already have good literacy skills. Changing instrument items into image stimuli can be used as input for the results of this research going forward.

Overall, the developed instrument received empirical support. So that this final instrument can be used to help students explore their future career choices. Career exploration that has been carried out will help students get more information about careers and the opportunities that exist, as well as stimulate students to have more curiosity about their careers (Guan et al., 2018). In addition, the process that occurs will help students to recognize their strengths and weaknesses, avoid blindness when making career decisions, and make rational career planning (Nie et al., 2012). Guidance from school counselors is needed to direct students in choosing majors in vocational high schools that are in accordance with their interests, talents and prospects in the future where the world of work continues to develop.

## CONCLUSION

The instrument that has been developed based on Anne Roe's career classification contains 32 statements and has obtained fit results on the CFA, CFASO and McDonald's multidimensional reliability tests. The developed instrument can obtain information about students' interest in a job so that it can be explored in more depth. The results of the suitability of the model test showed that the p-value was  $.257 > .05$  and the RMSEA .015 value was  $< .05$ . These results indicate a fit model with empirical data. In addition, the results of the reliability test showed a score of  $.87 > .70$  or Anne Roe's career exploration instrument was proven to be reliable. Suggestions for further researchers are that research can be directed to develop instruments that not only examine eight career groups, but also examine based on six levels

of expertise. In addition, the instrument items do not specifically use the reference of person and non-person career types that are characteristic of Anne Roe. This can be used as a basis for researchers to be developed in further research in the future.

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