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[CJES] Submission Acknowledgement

3 pesan

Prof. Dr. Hafize Keser <cjes.editorinchief@gmail.com>
Kepada: Rusli Ismail <rusli.ismail@unm.ac.id>

27 September 2022 pukul 17.53

Rusli Ismail:

Thank you for submitting the manuscript, "Career Maturity Questionnaire for Vocational High School Students: Development and Validation" to Cypriot Journal of Educational Sciences. With the online journal management system that we are using, you will be able to track its progress through the editorial process by logging in to the journal web site:

Manuscript URL: <https://un-pub.eu/ojs/index.php/cjes/authorDashboard/submission/7978>
Username: rusli_ismail

If you have any questions, please contact me. Thank you for considering this journal as a venue for your work.

Prof. Dr. Hafize Keser

The following message is being delivered on behalf of Cypriot Journal of Educational Sciences.

DR. RUSLI ISMAIL, M.Pd. UNM <rusli.ismail@unm.ac.id>
Kepada: "Prof. Dr. Hafize Keser" <cjes.editorinchief@gmail.com>

28 September 2022 pukul 13.20

Prof. Dr. Hafize Keser

You are welcome. We are proud to submit our paper to CJES and wish that the review process may not take too long but also gives some new insight for us to fill the gap in the knowledge body. We are also proud of the chance to review on a manuscript submitted on CJES. We wish that we can be a good partner with CJES in the present and future in developing new knowledge on educational sciences.

Sincerely yours
[Kutipan teks disembunyikan]

DR. RUSLI ISMAIL, M.Pd. UNM <rusli.ismail@unm.ac.id>
Kepada: "Prof. Dr. Hafize Keser" <cjes.editorinchief@gmail.com>

28 September 2022 pukul 18.58

Prof. Dr. Hafize Keser.

There is some little detail on my submission that need to be fixed. Our third writer, Dr. Nurlaela Latief, has not receive the email from CJES. We have checked what is wrong and found out that we mistakenly write her email address as nurlaela.latief@unm.ac.id and her true email address is nurlaela.latif@unm.ac.id. We will be glad if this little detail can be fixed and Dr. Nurlaela can get the email sent by CJES as part of our submission.

Thanks for your attention

Sincerely yours

Dr. Rusli Ismail

Pada tanggal Sel, 27 Sep 2022 pukul 17.54 Prof. Dr. Hafize Keser <cjes.editorinchief@gmail.com> menulis:
[Kutipan teks disembunyikan]



DR. RUSLI ISMAIL, M.Pd. UNM <rusli.ismail@unm.ac.id>

[CJES] Editor Decision

2 pesan

Prof. Dr. Hafize Keser, Editor-in-Chief <cjes.editorinchief@gmail.com>

18 Oktober 2022 pukul 01.20

Kepada: Rusli Ismail <rusli.ismail@unm.ac.id>, Nurlaela <nurlaela.latief@unm.ac.id>, Amiruddin <amiruddin@unm.ac.id>, Fiskia Rera Baharuddin <fiskia.rera@unm.ac.id>, Wirawan Setialaksana <wirawans@unm.ac.id>

Dear Rusli Ismail, Nurlaela, Amiruddin, Fiskia Rera Baharuddin, Wirawan Setialaksana:

We have reached a decision regarding your submission to Cypriot Journal of Educational Sciences, "Career Maturity Questionnaire for Vocational High School Students: Development and Validation".

Our decision is: Revisions Required

Editor Review and Comments

While preparing your manuscript for publication, there are some requirements listed below to improve your manuscript. Please pay attention to these requirements, revise your manuscript based on EDITOR AND REVIEWERS' comments and send it with a proofreading certificate and similarity report: PLEASE HIGHLIGHT THE PLACES YOU REVISED IN THE ARTICLE IN YELLOW.

- 1) Your paper must be edited by an ENGLISH NATIVE PERSON. After you have corrected your paper, you may make it in the center of Proofreading-Editing, which imposes a special rate for the journal author/s. www.proofreading-editing.eu.
- 2) Please use only the English language in the Manuscript. Including your name and affiliation information.
- 3) Do not write place or university name in the title and abstract. You can write in the method without repeating it in the relevant places.
- 4) Tables and graphics should be prepared in APA 7 style.
- 5) Your references should be written according to APA 7 Editing (American Psychological Association). All references must be given a DOI or (if not available) URL link. The link provided below may be helpful for you. https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/apa_changes_7th_edition.html
- 6) Please exclude the reference(s) which is/are not used in your paper.
- 7) Arrange the paragraphs to be at least 3 sentences and at most 6 sentences.
- 8) Make sure that your Manuscript consists of a minimum of 4000 and a maximum 7000 number of words.
- 9) Do not write place or university name in the title and abstract. You can write in the method without repeating it in the relevant places.
- 10) Write the keywords with a minimum of 5 and a maximum of 7. A keyword should contain no more than 2 words.
- 11) The abstract should be written as a continuous paragraph with 120-150 words and recapitulative state the background of the research, purpose, methodologies, major conclusions, and its contributions to the field. It should emphasize new or important aspects of the study.
- 12) Arrange the paragraphs to be at least 3 sentences and at most 6 sentences.
- 13) Ensure that all the in-text citations are included in the reference list (correspondence between in-text citations and your reference list).
- 14) Introductory part; It should consist of a "Conceptual or Theoretical Framework" and "Related Research".
- 15) If available, please add the DOI number of the cited references. If there is no DOI number, please provide the link to the URL.
- 16) The manuscript file must be in MS Word format only (not PDF) and should be formatted ready for submission, in the journal "Full-Paper-Template-for- After Review-Process" which can be downloaded from the link: <https://un-pub.eu/ojs/index.php/cjes/about/submissions>.
- 17) Please include all these main titles in your Manuscript (1. Introduction; 1.1. Conceptual or Theoretical Framework, 1.2. Related Research, 1.3. Purpose of the Study, 2. Method and Materials; 2.1. Research Model, 2.2. Participants, 2.3. Data Collection Tools, 2.4. Data Collection Process, and 2.5. Data Analysis, 3. Results, 4. Discussion, 5. Conclusion, 6. Recommendations).
- 18) Please click on the link below to pay the Article Processing Fee (APC) of the article. <https://un-pub.eu/ojs/index.php/cjes/apc>
- 19) The method part of the research should be written in detail. The method of research; research model, participants, data collection tools, data collection process, and data analysis should be written in detail under subheadings.
- 20) Please double-check the title (not more than 12 words), author(s)' names and affiliations and authors' contact

information, and references.

21) Please fill in the complete information of the authors on the journal website. The Authors name, University, faculty, department, city, country, email, and orcid (www.orcid.org) information must be filled out completely.

22) All authors must be a member of Orcid (www.orcid.org) and Publons (www.publons.com) academic websites and include all required information. If you are a member, please update., All authors, please visit <https://publons.com/journal/104595/cypriot-journal-of-educational-sciences> and click on the button ENDORSE THIS JOURNAL. Publons is part of Clarivate Analytics, and it is good to have endorsements.

23) Your suggested reviewers did not forward their thanks acknowledgment letter sent to Publons from the journal to Publons (reviews@publons.com), and have not Endorsement the Journal yet. Remind the author(s) and referees to do it.

During the editing process, we use iThenticate or Turnitin plagiarism software. It is recommended that the authors scan with iThenticate plagiarism or other free plagiarism software of their manuscripts and send us the similarity report (documents with an above 10% rating will not be published).

CORRECT ALL OF THE FOLLOWING ONE BY ONE AND SUBMIT THE ARTICLE AS SUCH WRITE AN ANSWER FOR EACH ITEM ABOUT THE CORRECTIONS YOU HAVE MADE.

We plan to publish your article in the forthcoming issue. Please make the necessary corrections within 10 days.

PLEASE CORRECT THE REFEREE'S CRITICISM, OR WRITE YOUR REASON.

Reviewer A:

Recommendation: Accept Submission

1. The keywords accurately reflects the content.

Maturity; Vocation; Research.

2. The title of the manuscript is appropriate.

The title is appropriate for the proposed research.

3. The abstract accurately reflects the content.

The abstract reflects the content of the research.

4. The research problem is clearly defined.

To give greater precision to the problem posed.

5. The manuscript contains new findings or ideas.

The research does contain new findings.

6. The manuscript adequately ties to the relevant literature.

The literature review meets the requirements of the research.

7. Methodology decisions (e.g., coding of data, data analysis, significance levels, grouping of subjects, sampling) adequately explained.

The methodological part is correct, it applies the required procedures.

8. The research design is adequate to achieve the study's objectives.

The research design is appropriate.

9. Data collection tools and procedures are clearly described.

The tools and collection are adequate for information processing.

10. Data analysis decisions are clearly explained.

Data analysis decisions are clearly justified in the research.

11. The discussion /conclusion section(s) adequately discuss (es) the findings.

The discussion and conclusion are in accordance with the results of the research conducted.

12. The recommendations are accurate and supported by findings and conclusions.

The recommendations are precise and have a theoretical basis.

13. The references are up-to-date, complete, and appropriate (APA 6 Style).

It is in APA 6.

14. The research is systematic and consistent.

The research is coherent, consistent and relevant.

15. Appropriate and accurate language is used.

The language is appropriate and accurate.

Your Additional Comments

It is a substantial contribution for researchers, providing valuable methodological elements for scientific research.

Reviewer B:

Recommendation: Revisions Required

1. The keywords accurately reflects the content.

The keywords are inadequate. Putting an abbreviation (e.g., EFA) as a keyword is not helpful to the reader.

2. The title of the manuscript is appropriate.

Consider changing the title to reflect that it is a new questionnaire: For example ...
Development and Validation of a new Career Maturity Questionnaire for Vocational High School Students

3. The abstract accurately reflects the content.

The abstract can be improved. Again, abbreviations are used without prior use in the text. When referring to the required factor loading, try to be explicit.

4. The research problem is clearly defined.

While one can make sense of what the problem might be, the way in which the problem is stated does not make for easy reading. This is compounded by the improper use of English. It should be followed by an explicit statement of what the research questions are.

5. The manuscript contains new findings or ideas.

The development of a new questionnaire is unique in the Indonesian context. The study clearly motivates why there is a need for this.

6. The manuscript adequately ties to the relevant literature.

A range of relevant literature have been consulted and referenced. This includes older literature when the original instrument was developed, as well as recent citations.

7. Methodology decisions (e.g., coding of data, data analysis, significance levels, grouping of subjects, sampling) adequately explained.

The methodology employed has been adequately explained with reference to the instrument, data analysis and sampling.

8. The research design is adequate to achieve the study's objectives.

The nature of the study requires a questionnaire to generate the data required. This meets the objectives of the study.

9. Data collection tools and procedures are clearly described.

The data collection tools, and procedures have been clearly described. It would be helpful to have the instrument as an addendum to the article.

10. Data analysis decisions are clearly explained.

It is clear how factor analysis has been used to arrive at the decisions made.

11. The discussion /conclusion section(s) adequately discuss (es) the findings.

The discussion and conclusions appropriately address all the findings.

12. The recommendations are accurate and supported by findings and conclusions.

An additional sentence or two to expand on why the recommendations are made would be helpful. For example, what would be the purpose of using confirmatory factor analysis.

13. The references are up-to-date, complete, and appropriate (APA 6 Style).

The references are up to date and proper use of APA citations is made.

14. The research is systematic and consistent.

The research has been systematically conducted.

15. Appropriate and accurate language is used.

This is unfortunately an area where the manuscript is problematic despite the usefulness of the study.

Your Additional Comments

I would urge that the manuscript be edited thoroughly for language use, grammar and editing errors.

The following message is being delivered on behalf of Cypriot Journal of Educational Sciences.



C-Career Maturity Questionnaire for Indonesian Vocational High School Students1.docx
149K

DR. RUSLI ISMAIL, M.Pd. UNM <rusli.ismail@unm.ac.id>

20 Oktober 2022 pukul 14.38

Kepada: "Prof. Dr. Hafize Keser, Editor-in-Chief" <cjes.editorinchief@gmail.com>

Dear CJES Editor

I have read the reviewer comments and revised the manuscript according the comments. I also have the revised version to get proofread. The revised version of my manuscript and its proofreading certificate are attached.

Sincerely yours

Rusli Ismail

[Kutipan teks disembunyikan]

2 lampiran



Development and Validation of a New Career Maturity Questionnaire for Vocational High School Students.docx
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Career Maturity Questionnaire for Vocational High School Students: Development and Validation

Abstract

For vocational school student, career maturity is an important part of the curriculum. The evaluation of the career maturity can be done using questionnaire. The existing career maturity instruments of CMI and revised CMI shows low internal consistency. Current research develops new instrument of career maturity. The instrument consists of 20-items Career Maturity Questionnaire and is constructed from the theory of vocational career maturity. Exploratory factor analysis was conducted to investigate the measurement property of the new questionnaire. The analysis shows that the construct consists of three factors which is a reduction of four factors of the vocational career maturity theory. Two factors are consistent with vocational career maturity theory. The last factor is shown to be the combination of career planning and self-concept. The Indonesian vocational career maturity has three factors of (1) Career Planning and Self Concept, (2) Career Decision Making and (3) Career Exploration. The questionnaire contains sixteen items giving a required factor loading. Further research can investigate the concurrent validation of the instrument.

Keywords: Career Maturity; Vocational School; EFA

Introduction

Globalization era popular with its liberal economics dan free trade especially in services field and workforce. To prepare the workforce with compatible skills and ability, vocational school was conducted. The rising demand of quality workforce and tight competition between workforce push the increasing number of vocational school (Ritonga, 2018). But this growing number of schools should be followed by the quality education. The state quality education may lead to the great development on the level of the country workforce skills and how effective the workforce work in the industry (Stephen, 2021). The vocational education can make economic growth by strengthen the human capital of the state (Field et al., 2009).

The vocational education has some level. Secondary vocational school is one of the vocational education parts. This kind of school are preparing students to be a workforce with a good skill that is needed by industry or work independently. The school aims to transfer wide range of skills including cognitive and noncognitive skills to students so that they can contribute to the growth of economy (Clayton et al., 2003; Unesco, 2012).

Vocational education system needs to be supported by student self-efficacy, especially their point of view of their career in the future. Secondary high school is the developmental stage of the student career maturity (Álvarez González, 2008). In this stage, the young adult will conceptualize and decide the pathway to their career in the future (Sultana, 2004; Swanson & Fouad, 2014).

Career maturity is one the most researched construct related to Career development. It is noted as important element for vocational development for adolescence (Bozgeyikli et al., 2009; Powell & Luzzo, 1998). Construct related to career maturity has been developed in decades and criticized for its linear property which is contrasted with career development nonlinear model (Rottinghaus et al., 2005; Savickas, 1997). Career adapt-ability proposed as a nonlinear alternative of career maturity (Lee et al., 2021; Maggiori et al., 2017; Ryba et al., 2017). Since the instrument constructed in current study is specialized for high school students

which has a relatively stable career exploration process, the suitable construct is career maturity.

Scale based on career maturity has been widely developed. One of them is Career Maturity Inventory (CMI). As instrument, CMI and its revised version, CMI-R, shows a low internal consistency (Busacca & Taber, 2002). Career maturity inventory developed by Savickas & Porfeli (2011) has good psychometric value but it was established for school students up to Grade 12. Moore & McLean, (1977) also develops career maturity questionnaire but it focuses on college students. The current study will establish a new questionnaire based on vocational career maturity theory developed by (Crites, 1969) in vocational high school students and investigate the psychometry property of the questionnaire.

Methods

Instruments

The instrument used in this study was constructed based on the the theory of vocational career maturity. There are 4 parts of these theory, they are (1) career exploration, (2) career planning, (3) vocational self-concept and (4) career decision making(Crites, 1969). The instrument are 20-item instrument. The items were established for vocational school student in Indonesia. The response to each item ranges from "strongly disagree" to "strongly agree" on a 5-level Likert scale. For data collection, the Indonesian version of the questionnaire was used.

Participants

The study sampled 1126 students of vocational high school aged 15 – 18 years in Indonesia. Participants voluntarily fills the electronic questionnaire.

Statistical Analysis

The statistical analysis of the data was done using JASP 0.14. JASP is an open source application. The instrument were analyzed using exploratory factor analysis (EFA). EFA is a multivariate technique to examine and group some items in some latent variables (Auerswald & Moshagen, 2019; Schreiber, 2021). The steps of the analysis is shown on the fig.1

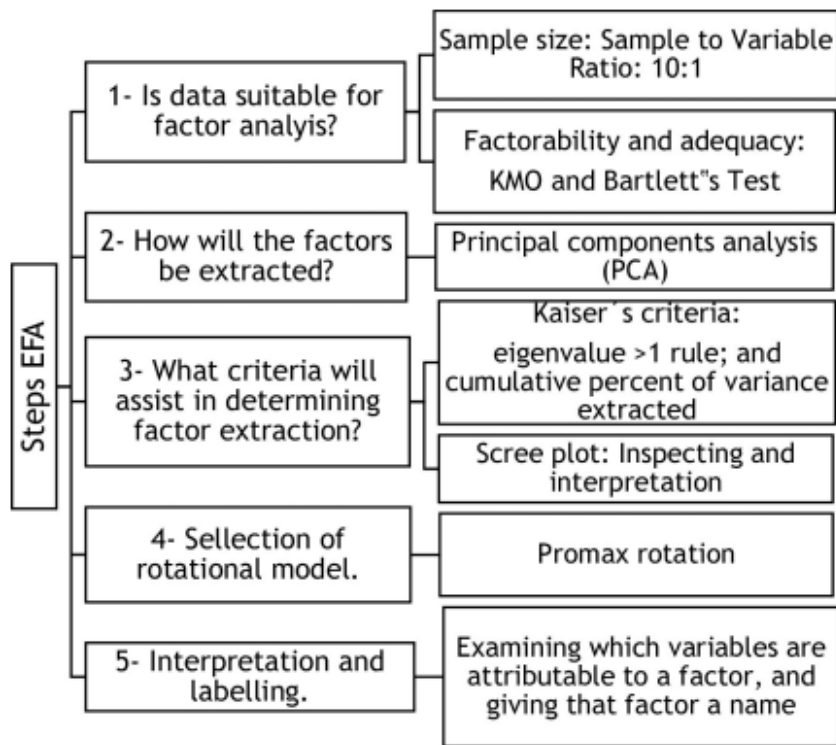


Fig 2. Five Steps of EFA to test an instruments.(Nunes et al., 2020)

These five steps will be conducted and presented in results section.

Results

Since the sample size is 1126 and the number of items is 20, the sample to variable ratio of 10:1 is fulfilled (Shmueli et al., 2019). To check the adequacy of the sample, Kaiser-Meyer-Olkin index (KMO) is a suitable tool (Shrestha, 2021). The table below shows the KMO index of questionnaire items.

Table 1. Kaiser Meyer Olkin Index of the Item on The Questionnaire

Aspects	Items	Code	MSA
Career exploration	I always looking for job that I want	EXP1	0.894
	I discuss about career with my family, teacher dan friends	EXP2	0.900
	I always seek for more than one job opportunities	EXP3	0.882
	If I get a job information, I will use the information to prepare myself for the job.	EXP4	0.893
	I have arranged my career in the future	EXP5	0.922
Career planning,	After graduated from vocational school, I have a mature plan to develop my career	PLAN1	0.893
	I have planned some alternative ways for my career in the future	PLAN2	0.922
	I sharpen my career plan	PLAN3	0.927
	In my point of view, career planning is a crucial step for career development.	PLAN4	0.798

	I always excited to follow a skill development program	PLAN5	0.936
Vocational self-concept	I know my talents and interest very well	SA1	0.878
	Knowing strength and weakness is necessary	SA2	0.875
	I can investigate factors that may support and hind my career	SA3	0.915
	I can adapt in a new condition	SA4	0.938
	To get my dream job, I will use my best efforts	SA5	0.953
Career decision making	I choose jobs based on my talents and interests	IND1	0.912
	In picking a job, I consider a good working environment of the job	IND2	0.942
	I choose the major I take in vocational high school by my self	IND3	0.877
	By taking school in vocational school, I have imagined what will I be in 5-10 years from now	IND4	0.883
	I take responsible on things that I choose related to my career in the future.	IND5	0.917
Overall MSA			0.908

The KMO index of the questionnaire is equal to 0.908. KMO index values between 0.8 and 1.0 is considered as adequate (Shrestha, 2021). Moreover, the KMO index lying above 0.9 has a marvelous degree of shared variance(Beavers et al., 2013). Another pre analysis test for factor analysis was Bartlett test of Sphericity. The test should be statistically significant as a requirement to advance to EFA (Watkins, 2018).

Table 2. Bartlett's test

X ²	df	p
6058.232	190.000	< .001

The result indicates that the test is statistically significant. Since the KMO index and Bartlett test of sphericity gives a required result, EFA may be conducted. The first step of EFA is factor extraction. There are some methods to identify the number of factors based on the eigen value of the correlation matrix. The methods are scree plot, Kaiser criterion's and the gold standard method of parallel analysis(Braeken & Van Assen, 2017). The parallel analysis consistently shows an accurate number of factors(Auerswald & Moshagen, 2019).

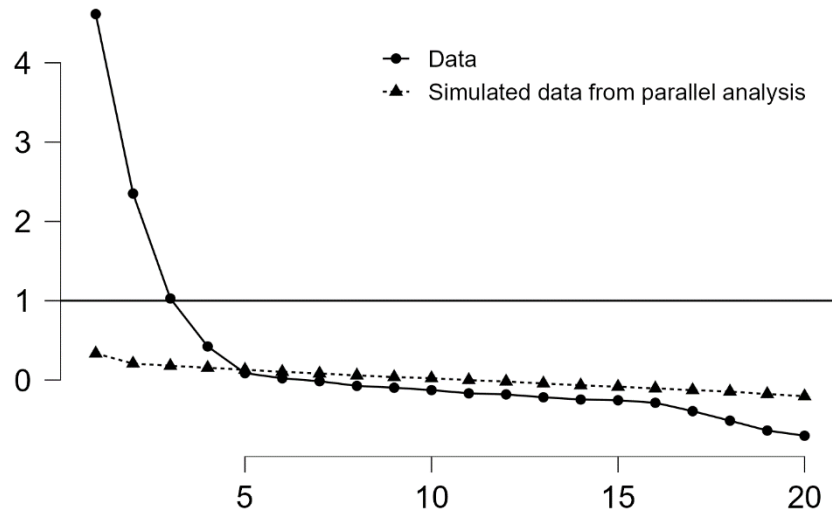


Fig 3. Scree plot of EFA on items

Scree plot method is heuristic method using line graph with eigenvalue on y-axis and the number of factors on x-axis (Ledesma et al., 2015). Scree plot is used to determine the optimum number of factors that can reflect a latent variable (R. Cattell, 2012; R. B. Cattell, 1966; Hair, 2011). The rule of thumb on the eigen value of scree plot is that it has to be larger than 1 (Nunes et al., 2020). The result shows that the optimum number of factors in career maturity latent variable is three.

Table 2. Parallel Analysis Result with Promax Rotation

	Factor 1	Factor 2	Factor 3	Uniqueness
EXP1			0.739	0.521
EXP2			0.457	0.758
EXP3			0.493	0.754
EXP4			0.583	0.599
PLAN1	0.572			0.671
PLAN2	0.452			0.675
PLAN3	0.463			0.637
PLAN4	0.487			0.846
SA1	0.461			0.65
SA2	0.523			0.598
SA3	0.523			0.661
SA4	0.418			0.704
IND1		0.514		0.664
IND3		0.774		0.543
IND4		0.556		0.626
IND5		0.54		0.587

Note. Applied rotation method is promax.

Parallel analysis is regarded as best method to determine the number of factor (Beauducel & Hilger, 2021; Goretzko et al., 2019; Lim & Jahng, 2019) (Lim & Jahng, 2019). Parallel analysis indicates that the instrument developed has three

factors. Table 3 shows that all item has factor loadings more than 0.4 which regarded as acceptable loadings for newly developed instrument (Hair et al., 2021; Hulland, 1999). Factor loading shows the contribution of item to its construct (Dijkstra, 2014; Hair et al., 2013). Higher loading means that the item has higher contribution to its construct.

The table above indicates that the Career Maturity Questionnaire consist of 3 factors. Some items (EXP5, PLAN5, SA5 and IND2) are excluded from the questionnaire. Items with factor loadings less than 0.4 should be omitted from model(Hair et al., 2013). The items showing good psychometric property will be investigate for the reliability. The next step is to check the construct reliability using McDonald's Omega, Cronbach alpha and Guttman's Lambda2 scale. McDonald's Omega is a more optimal measure of composite reliability than Cronbach Alpha (Hayes & Coutts, 2020) because Cronbach Alpha always give a lower bound of the reliability (Hair et al., 2019; Sarstedt et al., 2022). Even though omega shows optimal measure of composite reliability, Lambda2 scale gives more accurate estimation of the composite reliability (Cho, 2021). The table below shows McDonald's Omega, Cronbach alpha and Guttman's Lambda2 scale.

Table 3. Internal Consistency of the Questionnaire

Scale	McDonald's ω	Cronbach's α	Guttman's λ^2
Career Maturity Questionnaire	0.831	0.830	0.834

The internal consistency for new instrument, an internal consistency score of 0.5 can be regarded as adequate (Fornell & Larcker, 1981) and 0.6-0.7 for exploratory research (Hair Jr. et al., 2017). The internal consistency for advance research needs to be between 0.7 and 0.9 (Nunnally & Bernstein, 1994). The career maturity questionnaire gives internal consistency of 0.834 which is satisfactory for new instrument. The factor extraction result is concluded on the table below.

Table 4. Factors of Career Maturity Questionnaire for Vocational School Students

Factors	Items
Career Planning and Self-Concept	PLAN1, PLAN2, PLAN3, PLAN4, SA1, SA2, SA3, SA4
Career Decision Making	IND1, IND3, IND4, IND5
Career Exploration	EXP1, EXP2, EXP3, EXP 4

The result shows that three factors of the career maturity in students at vocational high school have good psychometric measurement. It can be concluded that career maturity in students at vocational high school has three factors of (1) career planning and self-concept, (2) career decision making, and (3) career exploration. The name of the factors was decided based on the vocational career maturity theory, but the analysis shows that career planning and self-concept was merged in to one factor.

Discussion

Items of the questionnaire built based on career maturity theory shows a good psychometric property. Most of items show factor loadings that exceed 0.4.

The factor extraction using parallel analysis indicates that the career maturity construct consists of 3 factors, different from 4 factors of career maturity theory by (Crites, 1969). The current study shows that career maturity in Indonesian students of vocational high school has three factors: (1) career planning and self concept, (2) career decision making, and (3) career exploration. A uniquely varied factors lies on first factor which regarded career planning and self-concept as single factor. In this point of view, the result may be considered as supporting to the career maturity theory.

Career planning focuses on how vocational high school students plan and take steps to get their dream job (Lau et al., 2019) whereas self-concept is the way students perceive their selves (Fenning & May, 2013). These two variables may correlate each other. Students showing good self-concept develop a positive attitude toward career planning (Hughes, 2011). This relationship may affect items in career planning and self-concept to merge in one factor.

The 16-item Career Maturity Questionnaire (CMQ) shows adequate internal consistency score contrasted with *career maturity inventory (CMI)* and *career maturity inventory-revised (CMI-R)* which have a weak internal consistency (Busacca & Taber, 2002). This result makes CMQ can be used in other research to measure career maturity in vocational high school students. The present research also has limitations. The validation of the instrument does not include the existing instrument of career maturity. This kind of validation is called concurrent validity.

Conclusion/Recommendations

Findings of the current study shows that the 16-item Career Maturity Questionnaire has shown an adequate psychometric property. The questionnaire may be used to measure the career maturity construct especially the vocational high school student career maturity. Career maturity on vocational high school in Indonesia has three factors: (1) career planning and self-concept, (2) career decision making, and (3) career exploration. These factors are consistent with the classic theory of vocational career maturity.

Further research may potentially be done by validating CMQ with existing questionnaire which measure the same construct. Since the validation of CMQ is done in Indonesian Students, it may also be developed and tested in another country with different culture. Since the instrument has been tested using exploratory factor analysis, it can be tested using confirmatory factor analysis.

Reference

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Development and Validation of a New Career Maturity Questionnaire for Vocational High School Students

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Abstract

For vocational school students, career maturity is an important part of the curriculum. The evaluation of career maturity can be done using a questionnaire. The existing career maturity instruments of CMI and revised CMI show low internal consistency. This research aims to develop new instruments for measuring career maturity. The instrument consists of a 20-item Career Maturity Questionnaire and is constructed based on the theory of vocational career maturity. Exploratory factor analysis (EFA) was conducted to examine the measurement property of the new questionnaire. The results of the analysis show that the construct consists of three factors deriving from four factors of the vocational career maturity theory. Two factors are consistent with the vocational career maturity theory. The last factor is found to be the combination of career planning and self-concept. The Indonesian vocational career maturity comprises three factors (1) Career Planning and Self Concept, (2) Career Decision Making and (3) Career Exploration. The questionnaire contains sixteen items giving the required factor loadings. Further research can investigate the concurrent validity of the instrument.

Keywords: career maturity, vocational school, exploratory factor analysis, development, validation

Introduction

The globalization era is popular with its liberal economy dan free trade, especially in the services field and workforce. To prepare the workforce with relevant skills and abilities, vocational education is provided. The increasing demand for quality workforce and tight competition in the industry result in the increasing number of vocational schools (Ritonga, 2018). This growing number of schools should be followed by quality education. Quality education may lead to the development of the country's workforce skills and the effectiveness of the workforce in the industry (Stephen, 2021). Vocational education can contribute to economic growth by strengthening the human capital of the state (Field et al., 2009).

Vocational education has some levels. Secondary vocational school is one of the vocational education levels. This level of education prepares students to be in the workforce with good skills needed by the industry or for working independently. The school aims to transfer a wide range of skills including cognitive and noncognitive skills to students so that they can contribute to the growth of the economy (Clayton et al., 2003; Unesco, 2012).

The vocational education system needs to be supported by student self-efficacy, especially their point of view of their career in the future. Secondary high school is the developmental stage of students' career maturity (Álvarez González, 2008). In this stage, the young adults will conceptualize and decide the pathway to their career in the future (Sultana, 2004; Swanson & Fouad, 2014).

Career maturity is one of the most researched constructs related to Career development. It is acknowledged as an important element of vocational development for students (Bozgeyikli et al., 2009; Powell & Luzzo, 1998). Construct related to career maturity has been developed for decades and criticized for its linear property, contrasted with career development nonlinear model (Rottinghaus et al., 2005; Savickas, 1997). Career adaptability is proposed as a nonlinear alternative to the career maturity (Lee et al., 2021; Maggiori et al., 2017; Ryba et al., 2017). Since the instrument constructed in the current study is for high school students which have a relatively stable career exploration process, the suitable construct is career maturity.

Scale based on career maturity has been widely developed. One of them is Career Maturity Inventory (CMI). As an instrument, CMI and its revised version, CMI-R, show a low internal consistency (Busacca & Taber, 2002). The career maturity inventory developed by Savickas and Porfeli (2011) has a good psychometric value but it was established for school students up to Grade 12. Moore and McLean, (1977) also developed a career maturity questionnaire but it focuses on college students. There are no questionnaires focusing on vocational high school students with their characteristics. The current study established a new questionnaire based on the vocational career maturity theory developed by Crites, (1969) for vocational high school students and investigated the psychometry property of the questionnaire.

Methods

Instruments

The instrument used in this study was constructed based on the theory of vocational career maturity. There are 4 parts of this theory: (1) career exploration, (2) career planning, (3) vocational self-concept, and (4) career decision-making (Crites, 1969). The instrument is a 20-item instrument. The items were established for students of vocational schools in Indonesia. The response to each item ranges from "strongly disagree" to "strongly agree" on a 5-level Likert scale. For data collection, the Indonesian version of the questionnaire was used.

Participants

The study sample comprised 1126 students of vocational high schools aged 15 – 18 years. The participants voluntarily filled out the electronic questionnaire.

Statistical Analysis

The statistical analysis of the data was done using JASP 0.14. JASP is an open-source application. The instrument was analyzed using exploratory factor analysis (EFA). EFA is a multivariate technique to examine and group some items in some

latent variables (Auerswald & Moshagen, 2019; Schreiber, 2021). The steps of the analysis are shown in fig.1

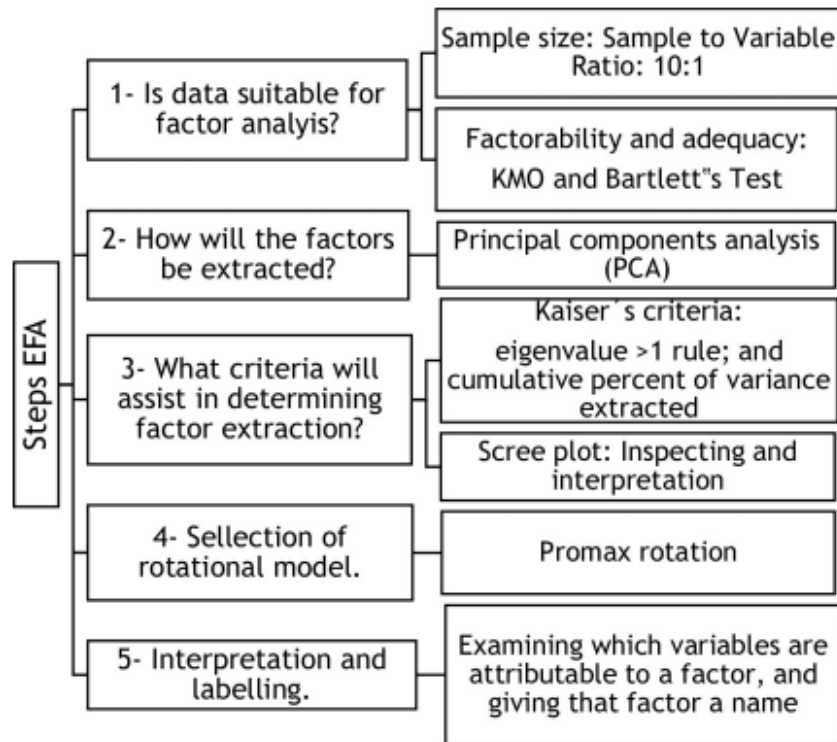


Fig 1. Five Steps of EFA to test an instrument.(Nunes et al., 2020)

These five steps are discussed in the results section.

Results

Since the sample size is 1126 and the number of items is 20, the sample to the variable ratio of 10:1 is fulfilled (Shmueli et al., 2019). To check the adequacy of the sample, Kaiser-Meyer-Olkin index (KMO) is a suitable tool (Shrestha, 2021). The table below shows the KMO index of questionnaire items.

Table 1. Kaiser Meyer Olkin Index of the Item on The Questionnaire

Aspects	Items	Code	MSA
Career exploration	I always look for job that I want	EXP1	0.894
	I discuss my career with my family, teacher dan friends	EXP2	0.900
	I always seek for more than one job opportunities	EXP3	0.882
	If I get job information, I will use the information to prepare myself for the job.	EXP4	0.893
	I have arranged my career in the future	EXP5	0.922
Career planning,	After graduated from vocational school, I have a mature plan to develop my career	PLAN1	0.893
	I have planned some alternative ways for my career in the future	PLAN2	0.922

	I sharpen my career plan	PLAN3	0.927
	In my point of view, career planning is a crucial step for career development.	PLAN4	0.798
	I always excited to follow a skill development program	PLAN5	0.936
Vocational self-concept	I know my talents and interest very well	SA1	0.878
	Knowing strength and weakness is necessary	SA2	0.875
	I can investigate factors that may support and hind my career	SA3	0.915
	I can adapt in a new condition	SA4	0.938
	To get my dream job, I will use my best efforts	SA5	0.953
Career decision making	I choose jobs based on my talents and interests	IND1	0.912
	In choosing a job, I consider a good working environment of the job	IND2	0.942
	I choose the major I take in vocational high school by my self	IND3	0.877
	By studying at a vocational school, I have imagined what I will be in the next 5-10 years from now	IND4	0.883
	I am responsible for things I choose related to my career in the future.	IND5	0.917
Overall MSA			0.908

The KMO index of the questionnaire is equal to 0.908. KMO index values between 0.8 and 1.0 are considered adequate (Shrestha, 2021). Moreover, the KMO index above 0.9 has a good degree of shared variance (Beavers et al., 2013). Another pre-analysis test for factor analysis was the Bartlett test of Sphericity. The test should be statistically significant as a requirement to advance to EFA (Watkins, 2018).

Table 2. Bartlett's test

X ²	df	p
6058.232	190.000	< .001

The result indicates that the test is statistically significant. Since the KMO index and Bartlett test of sphericity give the required result, EFA may be conducted. The first step of EFA is factor extraction. There are some methods to identify the number of factors based on the eigenvalue of the correlation matrix. The methods are scree plot, Kaiser criteria and the gold standard method of parallel analysis (Braeken & Van Assen, 2017). The parallel analysis consistently shows an accurate number of factors (Auerswald & Moshagen, 2019).

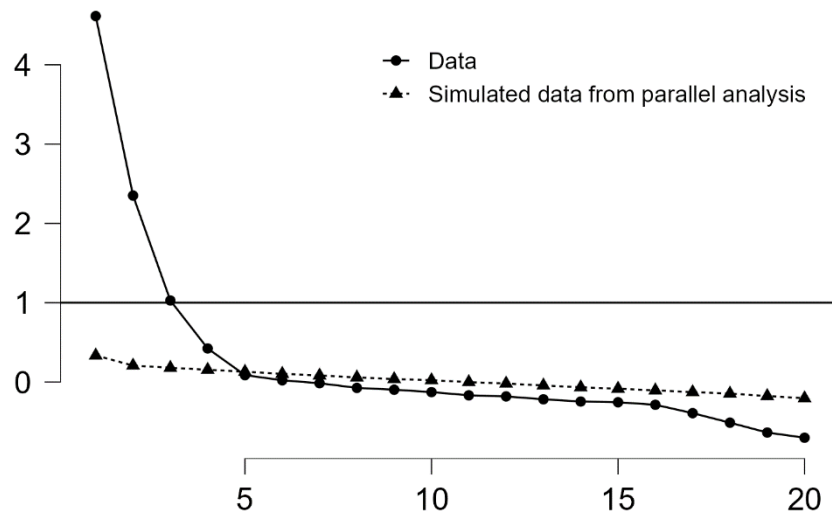


Fig 2. Scree plot of EFA on items

The scree plot method is a heuristic method using a line graph with an eigenvalue on the y-axis and the number of factors on the x-axis (Ledesma et al., 2015). Scree plot is used to determine the optimum number of factors that can reflect a latent variable (R. Cattell, 2012; R. B. Cattell, 1966; Hair, 2011). The rule of thumb on the eigenvalue of the scree plot is that it has to be larger than 1 (Nunes et al., 2020). The result shows that the optimum number of factors in the career maturity latent variable is three.

Table 3. Parallel Analysis Result with Promax Rotation

	Factor 1	Factor 2	Factor 3	Uniqueness
EXP1			0.739	0.521
EXP2			0.457	0.758
EXP3			0.493	0.754
EXP4			0.583	0.599
PLAN1	0.572			0.671
PLAN2	0.452			0.675
PLAN3	0.463			0.637
PLAN4	0.487			0.846
SA1	0.461			0.65
SA2	0.523			0.598
SA3	0.523			0.661
SA4	0.418			0.704
IND1		0.514		0.664
IND3		0.774		0.543
IND4		0.556		0.626
IND5		0.54		0.587

Note. Applied rotation method is promax.

Parallel analysis is regarded as the best method to determine the number of factor (Beauducel & Hilger, 2021; Goretzko et al., 2019; Lim & Jahng, 2019; Lim & Jahng, 2019). Parallel analysis indicates that the instrument developed has three factors. Table 3 shows that all item has factor loadings of more than 0.4 which is regarded as acceptable loadings for a newly developed instrument (Hair et al., 2021; Hulland, 1999). Factor loading shows the contribution of the item to its construct (Dijkstra, 2014; Hair et al., 2013). Higher loading means that the item has a higher contribution to its construct.

The table above indicates that the Career Maturity Questionnaire consists of 3 factors. Some items (EXP5, PLAN5, SA5 and IND2) are excluded from the questionnaire. Items with factor loadings less than 0.4 should be omitted from the model (Hair et al., 2013). The items showing good psychometric properties will be investigated for reliability. The next step is to check the construct reliability using McDonald's Omega, Cronbach alpha and Guttman's Lambda2 scale. McDonald's Omega is a more optimal measure of composite reliability than Cronbach Alpha (Hayes & Coutts, 2020) because Cronbach Alpha always gives a lower bound of reliability (Hair et al., 2019; Sarstedt et al., 2022). Even though omega shows an optimal measure of composite reliability, the Lambda2 scale gives a more accurate estimation of the composite reliability (Cho, 2021). The table below shows McDonald's Omega, Cronbach alpha and Guttman's Lambda2 scale.

Table 4. Internal Consistency of the Questionnaire

Scale	McDonald's ω	Cronbach's α	Guttman's λ_2
Career Maturity Questionnaire	0.831	0.830	0.834

Internal consistency for a new instrument, an internal consistency score of 0.5 can be regarded as adequate (Fornell & Larcker, 1981) and 0.6-0.7 for exploratory research (Hair Jr. et al., 2017). The internal consistency for advanced research should be between 0.7 and 0.9 (Nunnally & Bernstein, 1994). The career maturity questionnaire has internal consistency of 0.834 which is satisfactory for a new instrument. The factor extraction result is presented in the table below.

Table 5. Factors of Career Maturity Questionnaire for Vocational School Students

Factors	Items
Career Planning and Self-Concept	PLAN1, PLAN2, PLAN3, PLAN4, SA1, SA2, SA3, SA4
Career Decision Making	IND1, IND3, IND4, IND5
Career Exploration	EXP1, EXP2, EXP3, EXP 4

The result shows that three factors of career maturity of students at vocational high schools have good psychometric measurements. It can be concluded that career maturity of students at vocational high schools has three factors (1) career planning and self-concept, (2) career decision-making, and (3) career exploration. The name of the factors was decided based on the vocational

career maturity theory, but the analysis shows that career planning and self-concept were merged into one factor.

Discussion

Items of the questionnaire built based on career maturity theory show a good psychometric property. Most of the items show factor loadings that exceed 0.4. The factor extraction using parallel analysis indicates that the career maturity construct consists of 3 factors, different from the 4 factors of career maturity theory by Crites, (1969). The current study shows that career maturity in Indonesian students of vocational high school has three factors: (1) career planning and self-concept, (2) career decision-making, and (3) career exploration. A uniquely varied factors lie on the first factor which regard career planning and self-concept as single factors. In this point of view, the result may be considered as supporting the career maturity theory.

Career planning focuses on how vocational high school students plan and take steps to get their dream job (Lau et al., 2019) whereas self-concept is the way students perceive themselves (Fenning & May, 2013). These two variables may correlate with each other. Students showing good self-concept develop a positive attitude toward career planning (Hughes, 2011). This relationship may affect items in career planning and self-concept to merge in one factor.

The 16-item Career Maturity Questionnaire (CMQ) shows an adequate internal consistency score contrasted with *career maturity inventory (CMI)* and *career maturity inventory-revised (CMI-R)* which have a weak internal consistency (Busacca & Taber, 2002). Therefore, CMQ can be used in other research to measure career maturity of vocational high school students. The present research also has limitations. The validation of the instrument does not include the existing instrument of career maturity. This kind of validation is called concurrent validity.

Conclusion/Recommendations

The findings of the current study show that the 16-item Career Maturity Questionnaire has an adequate psychometric property. The questionnaire may be used to measure the career maturity construct especially the career maturity of vocational high school students. Career maturity at a vocational high school in Indonesia has three factors: (1) career planning and self-concept, (2) career decision-making, and (3) career exploration. These factors are consistent with the classic theory of vocational career maturity.

Further research could validate CMQ with an existing questionnaire that measures the same construct. Since the validation of CMQ is done with Indonesian students, it may also be developed and tested in other countries with a different culture. Since the instrument has been tested using exploratory factor analysis, it can be tested using confirmatory factor analysis.

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[CJES] Editor Decision

7 pesan

Prof. Dr. Hafize Keser, Editor-in-Chief <cjes.editorinchief@gmail.com> 21 Oktober 2022 pukul 19.05
Kepada: Rusli Ismail <rusli.ismail@unm.ac.id>, Nurlaela <nurlaela.latief@unm.ac.id>, Amiruddin <amiruddin@unm.ac.id>, Fiskia Rera Baharuddin <fiskia.rera@unm.ac.id>, Wirawan Setialaksana <wirawans@unm.ac.id>

Dear Rusli Ismail, Nurlaela, Amiruddin, Fiskia Rera Baharuddin, Wirawan Setialaksana:

We have reached a decision regarding your submission to Cypriot Journal of Educational Sciences, "Career Maturity Questionnaire for Vocational High School Students: Development and Validation".

Our decision is to Conditional Accept the Submission.

The official letter of acceptance will be sent to you when you provide the following,

- 1) The final version of your article is arranged according to the journal format,
 - 2) Article Processing Charge document,
 - 3) Less than 10% similarity report,
 - 4) Proofreading Certificate.
 - 5) All authors must visit <https://publons.com/journal/104595/cypriot-journal-of-educational-sciences/> and click on the button Endorse this Journal.
- Then, I sent all requested documents to the Copy Editor (bdcenter.editorial@gmail.com)

Thank you for your exemplary contribution. On behalf of the Editors of the CJES, we look forward to your continued contributions to the Journal.

Sincerely,

The following message is being delivered on behalf of Cypriot Journal of Educational Sciences.



C-Development and Validation of a New Career Maturity Questionnaire for Vocational High School Students.docx

152K

DR. RUSLI ISMAIL, M.Pd. UNM <rusli.ismail@unm.ac.id> 23 Oktober 2022 pukul 14.46
Kepada: "Prof. Dr. Hafize Keser, Editor-in-Chief" <cjes.editorinchief@gmail.com>, bdcenter.editorial@gmail.com

Dear CJES Editor

We are proud that our manuscript is conditionally accepted in CJES. In order to make it unconditionally accepted, we have fulfilled all the required documents. The documents are attached to this email. For the fifth requirement, we found that the link given directed us to clarivate website since publons has been joined in Web of Sciences. We can not find the endorse button in the clarivate website.

Thank you.

Sincerely yours

Rusli Ismail

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25 Oktober 2022 pukul 17.55

Received, thank you.

Thanks for your cooperation.

Best regards.
Daniel Sekyere-Asiedu
Copy-Editor

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10 November 2022 pukul 11.00

Thank you for your information. I want to ask when our manuscript will be published.

Best regards
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DR. RUSLI ISMAIL, M.Pd. UNM <rusli.ismail@unm.ac.id>
Kepada: "Prof. Dr. Hafize Keser, Editor-in-Chief" <cjes.editorinchief@gmail.com>

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Pada tanggal Jum, 21 Okt 2022 pukul 19.05 Prof. Dr. Hafize Keser, Editor-in-Chief <cjes.editorinchief@gmail.com>
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2 Desember 2022 pukul 13.06

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