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RIASEC Holland's reliability and validity on personality of informatics engineering education students in higher education

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ABSTRACT

Holland code is an approach used in psychometrics to see human personality through traits that are arranged in six personality domains which are formed using factor analysis. This study aims to test the reliability and construct validity of the RIASEC Holland instrument, which will later be applied to 178 students of Engineering Education in Indonesia. The method used is confirmatory factor analysis. The results of this study indicate that the prediction of the reliability of the six Indonesian versions of Holland's personality using 178 students shows that Cronbach's alpha is quite large, between 0.601 and 0.699. and the intercorrelation between Holland's Personality proved to have a positive correlation. Construct validity test obtained a fit model where the p value = 0.26972 and RMSEA = 0.02.which shows this model is fit, where the model is said to be fit if the p value > 0.05 and RMSEA < 0.05. This shows that the conformity of the empirical data with the RIASEC typology model which is used as a theoretical concept is at a valid level.

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Introduction

Education is an important aspect in human life, therefore relevant education is needed in accordance with the changing times. So that requires individuals to be able to develop their potential based on the skills needed in the world of work. Engineering education is one of the scientific fields that is oriented to the needs of the job market (Hidayat et al., 2021), because graduates of engineering education are also prepared to be able to work with their competencies (Hidayat et al., 2020), and are also able to become entrepreneurs in the community (Ganefri et al., 2021). But the fact is that engineering education is actually a contributor to educated unemployment in Indonesia. The Central Statistics Agency (BPS) in 2021 noted that the number of educated unemployed graduates of engineering education reached 11.85% out of 9.1 million people. This condition is very worrying and requires serious handling from the government. One of the factors that influence the occurrence of educated unemployment is the inappropriate selection of jobs that are relevant to the personality of engineering education graduates in Indonesia has an educated workforce in the field of engineering education as much as 6.6% and those who work according to their educational competencies and qualifications only reach 3.2%thereby increasing the occurrence of horizontal and vertical mismatches for engineering education graduates in Indonesia (Ministry of Manpower of the Republic of Indonesia 2021).

Personality is a specific pattern of behavior of each individual in dealing with life, such as life problems, cooperation, stress, anxiety, decision making, all of which are needed in the world of work (Muspawi and Lestari 2020; Rosliani and Ariati 2016). Holland defines personality as a unique pattern of behavior in every human being in dealing with the dynamics of life, this personality greatly influences a person's pattern in the work environment (Cewińska et al. 2017). Job compatibility with personality types can increase performance and job satisfaction (Darni, Novaliendry, and Dewi 2020). Holland's theory of personality makes six personality types and six parallel environments, namely Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E) and Conventional (C) which are referred to collectively as RIASEC Holland (Fatmasari and Supriyatna 2019). Personality Type Theory is a theory put forward by John Holland which states that an effort should be made to match an individual's career choice with his personality. In Holland's model, the relationship between personality and environment is more direct.

Personality relates to a person's opinion about work, while the work environment is defined with regard to the people who employ them and their work environment, as well as the actions they take. RIASEC personality type is described through likes and dislikes that influence work environment decisions. According to Holland, if an individual finds a career that fits his personality, then the individual will enjoy that career and can last a long time. Holland describes this framework as a hexagon, but many other researchers have described the circular sequence and structure of the six RIASEC categories as circumplexes (Morgan and de Bruin 2018) as can be seen in Figure 1. Holland developed a personality-based career selection questionnaire containing 160 occupations. Respondents choose a job they like or dislike and the answers are used to form a personality profile. The way to identify a career is represented by a hexagon. A hexagon represents the similarities and differences in characteristics between people, between jobs, and between people and jobs. So far, the application of the Holland personality instrument has only been applied in western countries, and when adopted in Indonesia, linguistic inconsistencies often occur, resulting in misunderstandings for students, and fatal consequences in determining student career decisions.

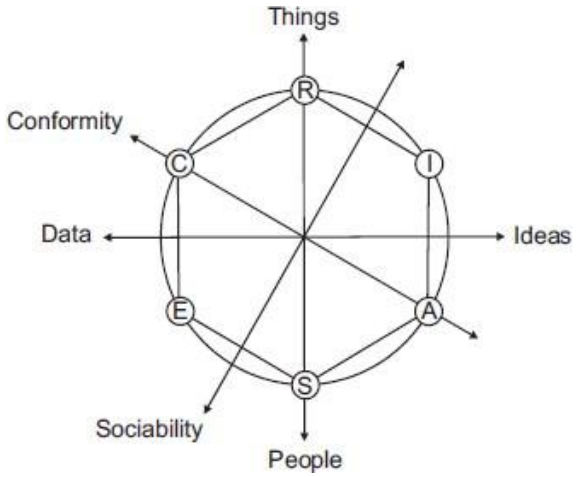

Figure 1. Circular Structure of Holland's Hexagonal

Based on the problems above, to overcome the linguistic inconsistency in the Holland personality instrument adopted in Indonesia, the Indonesian version of the RIASEC Holland personality instrument was developed with 106 questions, each question requires a yes or no answer, the details of the number of questions for each personality type are as follows : 18 questions for each personality type Holland which includes - Realistic (R), Investigative (I), Artistic (A), Social (S), and Enterprising (E), while for the conventional personality type (C), there are 16 question. The questions are shown in Table 1.

Validity and reliability become the main discussion in every measurement in research. Both focus on how to create a measure that is connected to the construct being measured. Reliability and validity are very important because the constructs of social theory are often ambiguous, confusing and often cannot be directly observed. All researchers want their measurements to have good validity and reliability. Reliability measures are used to determine how consistent test scores are, and the extent to which test results are influenced by external factors. When test reliability is greater, there is more likely to be consistency when evaluating differences between individuals. How reliable a tool is can be shown through the correlation coefficient. The reliability coefficient is represented by the letter r, and is a number between 0.00 and 1.00, where r=0 indicates zero reliability, and r=1.00 indicates perfect reliability. Most importantly, it should be highlighted that the test is not completely reliable, so r = 1.00 is an impossible score to achieve. In all cases, the reliability coefficient is

displayed as a decimal, and when it is larger, the test scores are considered more reliable and consistent (Moafian et al. 2019; Kahveci et al. 2016).

Table 1. RIASEC Holland Questions

R	3	8	10	15	26	31	36	37	42	45	54	65	82
	85	96	99	100	101								
I	13	16	18	19	25	29	43	44	48	50	52	60	66
	73	76	77	93	98								
A	1	4	14	17	32	33	35	40	47	49	58	68	80
	81	90	91	102	105								
S	5	6	7	22	23	28	46	59	62	63	64	67	72
	78	84	88	94	104								
E	9	11	20	21	30	34	41	51	53	55	61	69	74
	75	89	95	97	106								
C	2	12	24	27	38	39	56	57	70	71	79	83	86
	87	92	103										

Validity is the second most important element when testing and making a decision to use an assessment tool. Validity comes from the word validity which means the extent to which the accuracy and accuracy of the measurer (test) in carrying out its measuring function (Pässler and Hell 2020). Validity is related to the accuracy of the assessment tool against the concept being assessed so that it really assesses what should be assessed (Marton et al. 2020). Reliability concentrates on the consistency of evaluation results, while validity assesses usefulness. A test can be said to have high validity if the test carries out its measuring function, or provides precise and accurate measurement results in accordance with the purpose of the test. A test that produces data that is not relevant to the purpose of the measurement is said to be a test that has low validity (Access and Tracey 2021). So that the implementation of the validity and reliability of a test is very important. For a test to be considered valid, it needs to offer data that is useful in decision making. Evidence of validity states that conclusions and predictions are categorized through test results. Certain types of evidence can offer data based on the use of valid tests. All the evidence is capable of establishing the level of usefulness of the test with a particular individual and situation. Usually cases of different types of validity are examined in detail (e.g. construct validity, content validity, criterion validity), it is better to consider these as sources of evidence assessing the overall validity of the test.

Content validity is related to the level of the scale that accurately describes the proposed construct. On the other hand, instead of using the general public, experts evaluate their specialist field of study. These experts offer feedback on the meaning of scale items, and whether they relate to key concepts accurately, as well as general scale constructs. In this study, content validity was evaluated by seven psychologists. According to these experts, the original RIASEC scale is widely used in Indonesia for career planning, and provides true guidance for individual career development. Psychological Counselor experts state that job interest is the best point to start when determining the right career path for someone.

A person's personality usually reflects the choice of a career that will be lived. Career choice theory developed by John L. Holland is the most widely applied career development theory both in determining one's career (Nistal, Soto, and Zaragoza 2019). Some theories combine several constructs of personality psychology, including behavioral engineering, and social psychology, including theories of self-perception and social stereotypes (Zainudin et al. 2020). Holland's theory has received worldwide recognition for its straightforward explanations, its ability to be empirically evaluated, its ease of use, and how easy it is to understand the results (Nauta 2010). One of the most appropriate instruments recommended for RIASEC-type evaluation is Self-Direct-Search – SDS (Kemboi, Kindiki, and Misigo 2016). Holland suggests 6 basic personalities that must be considered when adjusting an individual's psychological state and career (Anggraini et al., 2020).

Every individual has two intersecting personalities, which can be utilized and have the potential to improve their work abilities in the workplace. Other information also obtained from the results of factor analysis is the magnitude of the correlation coefficient between two pairs of dimensions denoted by letters, for example, the correlation coefficient between pairs of letters R and I = 0.84 with a standard error of 0.07. This correlation

coefficient can indicate the degree of conformity with the model. hexagonal in the RIASEC typology developed by Holland (Darni et al. 2021). The personality correlation model is shown in Figure 2

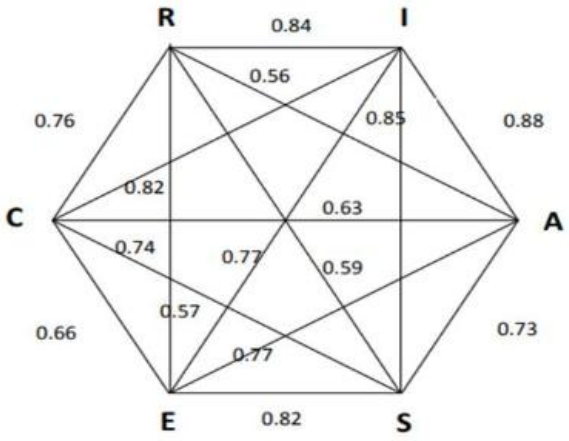

Figure 2. Correlation between Holland . personality types

This SDS instrument has undergone 25 different translations, is used by more than 22 million people from around the world, with mixed cultural backgrounds. The related main ideas regarding Holland's six personality types have broader empirical support, with results derived from various cross-cultural and meta-analytical papers underscoring the validity of the related (Pozzebon, Visser, and Bogaert 2015; Wasylow et al. 2006). The results of an empirical study in Brazil through the Questionário de Busca Auto-Dirigida, presented clear findings for validity regarding the internal structure of SDS. Further research using SDS found evidence of validity through the RIASEC model in Brazil, and in particular with regard to external variables, important for understanding certain career types, such as personality (Chae and Jin 2015); career choice (Jemini-Gashi and Bërxulli 2017); other measures of importance; self-efficacy for work activities (Baiti, Abdullah, and Rochwidowati 2017); cognitive skills; gender, school year and parental education.

A research paper in Turkey used the RIASEC scale which consisted of 41 items and was modified to suit the Turkish language and culture. Each RIASEC type is described by 6 or 7 items. The results were collected from a sample of 364 business professionals. The survey results show that there is a satisfactory level of reliability for the scale, with a Cronbach's alpha of 0.889. The results of this paper put forward the idea that the short version of RIASEC requires significant changes to provide validity in terms of engineering profiles in the Turkish environment. From the potential changes pointed out in the previous comments, extra care should be taken not to cause problems when choosing Realistic and Conventional; Enterprising and Recognition Items. In addition, RIASEC's Social and Conventional dimensions are proven to be related to Work Value,(Aljojo and Saifuddin 2017). Research conducted in Croatia also revealed that the Holland instrument which was tested on 1866 adolescents in Croatia stated that the instrument was considered good and reliable to use. Another study conducted in Brazil tested the Holland instrument with a total of 1256 high school students as respondents revealing that the six RIASEC factors on the Holland instrument were consistent. However research conducted in Hong Kong revealed that there are several cultural contextual factors that may be related to the lack of fit of Holland's model in the Hong Kong sample. So in this study, we will re-measure the validity and reliability of Holland's career interest instrument in Indonesian territory, this is an effort to determine the accuracy of Holland's instrument in its application in Indonesia.

Method

This study uses a non-experimental quantitative research approach design. Data collection in this study used a Holland personality instrument that had undergone linguistic modifications. The distribution of the instrument was carried out offline in 2 engineering study programs, namely Informatics Engineering and Informatics Engineering Education and 1 social study program, namely Remote Sensing Technology at Padang State University. The test is carried out on a computer-based basis by accessing the career choice test web page that has been developed. The data from the instrument results are then analyzed using a structural equation model analysis or commonly called Structural Equation Modeling (SEM) and a confirmatory validation test or Confirmatory Factor Analysis (CFA). to answer the formulation of the problem in this study. The participants of this study were 178 students (100 male; 78 female) in the final semester from 3 different study programs at Padang State University, namely 28 students from the Informatics Engineering study program, 27 students

from the Informatics Engineering Education study program, and 123 students from the Remote Sensing Technology study program.

The research instrument uses the Holland personality instrument which has been modified linguistically so that it is easily understood by users in Indonesia, the number of questions on the instrument is 106 questions, each question requires a yes or no answer, the details of the number of questions for each personality type are as follows. following: 18 questions for each Holland personality type which includes - Realistic (R), Investigative (I), Artistic (A), Social (S), and Enterprising (E), while for the conventional personality type (C), there are 16 questions. The questions are shown in Table 1. Respondents were asked to answer each item of career interest choice questions. The answers from the respondents were then recorded for reliability analysis using Cronbach's alpha, Cronbach's alpha value is quite large between 0.601 and 0.699. and the intercorrelation between Holland's personality proved to have a positive correlation.

Data collection procedures, after making initial contact with several study programs within the Padang State University and obtaining the leadership authority of each department and study program, the data collection process was carried out. Students are collected in several computer laboratory rooms in each study program and department, then students are asked to open a website address, namely c-exsys.my.id to be able to connect to the career choice application. Furthermore, students are asked to register and fill in personal data. After that the system will send the username and password to the e-mail address that has been registered by the student. After students log in, then students can fill in the career selection instrument consisting of 106 questions about themselves.

The first step is to test the construct validity through confirmatory factor analysis (CFA). In CFA there is a theory about data structure, which in this case is referred to as a measurement model (Measurement Model). This measurement model is used as a theory that will be tested for validity based on data from the field (empirical) which is called a construct test. This construct validity test will then determine whether each item on the scale measures the component to be measured, in this case each dimension of the measuring instrument being tested. The data from this construct test is then proposed as a hypothesis in the CFA. The basic logic of the CFA is as follows:

Test the hypothesis: do all items measure one defined construct.
The idea from this first stage is that if there is no difference (residual) between the data (S) and the theory (∑), then a model can be said to fit the data. In this case is the correlation matrix between items according to H0, while S is the correlation matrix between items obtained from observation. If there is a significant difference between the theory and the data, then a model is said to be unfit with the data. The null hypothesis which reads "there is no difference between the matrix and the S matrix" is then tested by chi-square. If the chi-square is not significant or $p>0.05$, then the null hypothesis is "not rejected". This means that the unidimensional theory is acceptable, where the item only measures one factor.

Test the hypothesis: whether each item yields significant information about the construct being measured.
At this stage, the writer finds out which items will be valid and which items will be invalid. The criteria for a good item in the CFA are as follows: 1) Seeing whether or not an item is significant in providing information about a construct. The comparison is if $t > 1.96$ then the item is significant and vice versa; 2) View the factor loading coefficient of the item. If the item has been scored favorably (on a Likert scale of 1-4), then the value of the factorial charge coefficient on the item must be positively charged, and vice versa. If the item is favorable, but the item factor loading coefficient is negative, it indicates that the item is not valid; 3) Finally, if the measurement error of the item is too much correlated, then the item is not good, and it is recommended to be eliminated. This is because the item in question, in addition to measuring what is being measured, also measures other things that are needed.

Results and Discussions

Internal Consistency Reliability Results
To estimate the reliability of the internal consistency of the scores, Cronbach's alpha coefficients were calculated for each of the six Personalities of the Indonesian version of RIASEC Holland, based on a sample of 178 students. All participants were students from Padang State University (Faculty of Engineering and Faculty of Social Sciences), with twenty-eight of whom took the Informatics study program, twenty-seven studied in the Informatics Engineering Education study program, and one hundred twenty-three became students in the Sensing study program. Long distance. Cronbach's alpha values are presented in Table 2.

Table 2. The value of Cronbach's alpha

RIASEC	Cronbach's alpha
Realistic (R)	.601
Investigative (I)	.628
Artistic (A)	.621
Social (S)	.600
Enterprising (E)	.699
Conventional (C)	.669

Comparison of RIASEC Holland Scores in Indonesian Version between Study Programs

The comparison of student RIASEC scores between Informatics, Informatics Engineering and Remote Sensing study programs in the first semester is shown in Table 3, based on Holland's personality frequency as follows: 1) Students of the Informatics Engineering Study Program have a higher Social (S) percentage of 71%, but have a lower percentage of Artistic personality (A); 2) Students of the Informatics Engineering Education Study Program have an artistic personality (A) which is 80% higher, but has a low percentage of a Realistic personality (R); 3) Remote Sensing Study Program students have a Social (S) percentage, which is 74% higher, but has a low percentage of Realistic (R) personality.

Results of Structural Equation Modeling (SEM) Factor Analysis

Factor analysis provides evidence of construct validity for the Indonesian version of RIASEC Holland. As a final verification of the ability of items to represent areas of interest, RIASEC Holland is very precise with 106 items being the target of factor analysis. Principal component analysis with a six-factor solution was rotated using the varimax procedure. Table 4

Table 3. Comparison of student's Holland Personalities frequencies

Majors	Realistic (R)	Investigative (I)	Artistic (A)	Social (S)	Enterprising (E)	Conventional (C)
Informatics Engineering	61%	63%	58%	71%	61%	62%
Informatics Engineering Education	64%	65%	80%	76%	68%	73%
Remote Sensing Technology	56%	63%	70%	74%	66%	61%

Table 4. Principal Component Analysis.

Realistic		Investigative		Artistic		Social		Enterprising	
Item	Load	Item	Load	Item	Load	Item	Load	Item	Load
q3_R	.519	q13_I	.698	q1_A	.655	q5_S	.648	q9_E	.443
q8_R	.537	q16_I	.606	q4_A	.725	q6_S	.611	q11_E	.523
q10_R	.762	q18_I	.603	q14_A	.652	q7_S	.574	q20_E	.644
q15_R	.591	q19_I	.672	q17_A	.735	q22_S	.668	q21_E	.518
q26_R	.573	q25_I	.505	q32_A	.609	q23_S	.541	q30_E	.571
q31_R	.642	q29_I	.460	q33_A_	.581	q28_S	.566	q34_E	.518
q36_R	.608	q43_I	.498	q35_A	.593	q46_S	.499	q41_E	.582
q37_R	.663	q44_I	.462	q40_A	.659	q59_S	.561	q51_E	.575
q42_R	.540	q48_I	.720	q47_A	.434	q62_S	.565	q53_E	.568
q45_R	.591	q50_I	.621	q49_A	.635	q63_S	.670	q55_E	.606
q54_R	.567	q52_I	.539	q58_A	.615	q64_S	.669	q61_E	.507
q65_R	.768	q60_I	.578	q68_A	.690	q67_S	.515	q69_E	.487
q82_R	.813	q66_I	.709	q80_A	.728	q72_S	.488	q74_E	.667
q85_R	.558	q73_I	.478	q81_A	.723	q78_S	.488	q75_E	.467
q96_R	.484	q76_I	.445	q90_A	.563	q84_S	.666	q89_E	.520
q99_R	.697	q77_I	.485	q91_A	.643	q88_S	.503	q95_E	.516
q100_R	.721	q93_I	.551	q102_A	.720	q94_S	.582	q97_E	.442
q101_R	.590	q98_I	.617	q105_A	.695	q104_S	.564	q106_E	.636

This stage explains the validation of Holland's personality instrument. An instrument is said to be valid, if the instrument can measure what is being measured, this needs to be done to minimize the level of error in the measurement results of the instrument. Construct validity is one type of rational internal validity of an instrument that shows the extent to which the instrument expresses a trait or theoretical construct that it wants to measure. In this case, the construct is a conceptual framework that becomes a source of expertise in the expert system to be developed. The theoretical traits or constructs that will be validated are Holland's 6 personality types which have a correlation with a particular job, while his personality types are Realistic, Investigative, Artistic, Social, Enterprising, Conventional. This construct validation process is carried out using factor analysis, the purpose of using this factor analysis is to define the structure of the data matrix and analyze the structure of the relationship (correlation) between a large number of process variable constructs by defining a set. similarity or dimension variables. With factor analysis, the dimensions of a structure can be identified and then determined to what extent each variable can be explained by each dimension. Through this factor analysis can summarize the information contained in the original variable or the initial variable into a new set of dimensions. The factor analysis model using Structural Equation Modeling (SEM) on this personality type is shown in Figure 3.

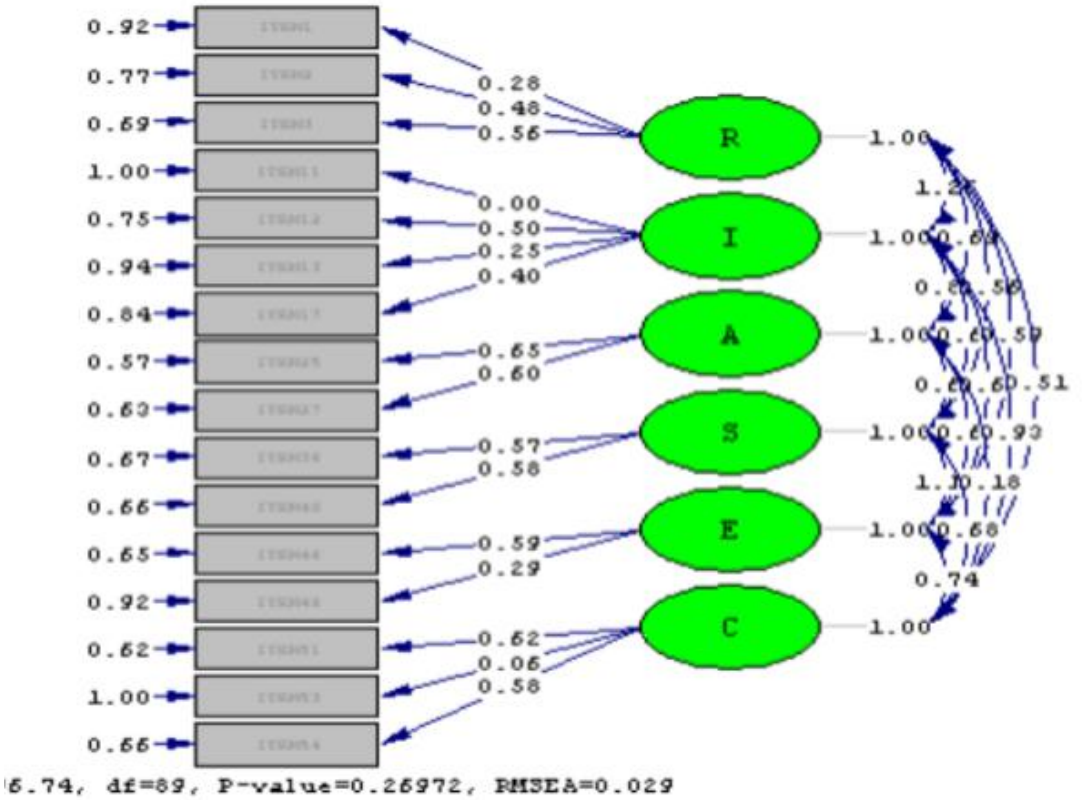

Figure 3. Factor Analysis Model using Structural Equation Modeling (SEM)

Correlation Analysis Results

As shown in Table 6, the intercorrelation between Holland Personality is as follows: 1) Realistic which is positively correlated with Artistic, Social, Enterprising, Conventional, and Investigative; 2) Artistic which is positively correlated with Realistic, Conventional, Social, Enterprising and Investigative; 3) Conventional which is positively correlated with Artistic, Social, Enterprising, Realistic and Investigative; 4) Social is positively correlated with Realistic, Artistic, Conventional, Enterprising and Investigative; 5) Enterprising which is positively correlated with Realistic, Artistic, Conventional, Social and Investigative; 6) Positively correlated investigative with Realistic, Artistic, Conventional, Social and Enterprising.

Table 5. Descriptive Statistics

	Mean	Std. Deviation	N
R	10.4551	2.71024	178
A	11.3820	2.83045	178
C	11.2640	2.72319	178
S	13.3202	2.65401	178
E	11.8202	3.18209	178
I	11.3146	2.99753	178

Table 6. Correlations Matrix

		R	A	C	S	E	I
R	Pearson Correlation	1	.474**	.310**	.412**	.378**	.486**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	178	178	178	178	178	178
A	Pearson Correlation	.474**	1	.273**	.482**	.486**	.448**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	178	178	178	178	178	178
C	Pearson Correlation	.310**	.273**	1	.564**	.567**	.586**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	178	178	178	178	178	178
S	Pearson Correlation	.412**	.482**	.564**	1	.686**	.536**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	178	178	178	178	178	178
E	Pearson Correlation	.378**	.486**	.567**	.686**	1	.565**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	178	178	178	178	178	178
I	Pearson Correlation	.486**	.448**	.586**	.536**	.565**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	178	178	178	178	178	178

**. Correlation is significant at the 0.01 level (2-tailed).

Personality is a specific pattern of behavior of each individual in dealing with life (Elvina, 2019), such as life problems, cooperation, stress, anxiety, decision making, all of which are needed in the world of work. The suitability of career choice with personality type has a major impact on individual success in career and work performance (Ahmed et al., 2017; Jackson, & Wilton, 2017; Kazi, & Akhlaq, 2017). So far, the application of the Holland personality instrument has only been applied in western countries, and when adopted in Indonesia, linguistic inconsistencies often occur, resulting in misunderstandings for students, and fatal consequences in determining student career decisions, so it is very necessary to make modifications and suit the needs in the field (Jati et al., 2019). Thus, this study tries to test the validity and reliability of the career selection test instrument in the field of Engineering Education that has been developed. The construct validity test in this study used confirmatory factor analysis (Phan, & Rounds, 2018; Ayriza et al., 2020; Kwanyuen et al., 2021), while for the reliability test using Cronbach's alpha, through this study, the results of the RIASEC Holland typology were also obtained by conducting structural regression analysis in three study programs at

Universitas Negeri Padang, namely Informatics Engineering. : Social (71%), Informatics Engineering Education : Artistic (80%), Remote Sensing Technology : Social (74%).

The results of this study confirm that the value of Cronbach's alpha is quite large, between 0.601 and 0.699. and the intercorrelation between Holland's Personality proved to have a positive correlation. The positive intercorrelation on Holland's personality is as follows R which has a positive correlation with (I, A, C, E) but has a low correlation on S. Personality type A has positive collaboration with (I, R, E, S) but has a low correlation on C, personality type C has positive collaboration with (I,R,S,E) but has a low correlation on A, personality type S collaborates positively with (A,I, E, C) but has a low correlation on R, personality type E collaborates positively with (S, A,I,C) but has a low correlation on R, personality type I collaborates positively with (R, A,S,C) but has a low correlation on E. Besides that, we also confirm that. The results of factor analysis on the Holland personality typology are valid, as evidenced by $p = 0.26972$ and RMSEA = 0.02 which indicates this model is fit, where the model is said to be fit if the p value > 0.05 and RMSEA < 0.05. This shows that the conformity of the empirical data with the RIASEC typology model which is used as a theoretical concept is at a valid level. The hexagonal model in RIASEC using factor analysis can be confirmed that the personality types that are next to each other or side by side generally have a large correlation value, compared to the personality types that are opposite. All positive correlations built through this typology can be categorized as moderate variables, so that differences and congruence between personality types can be seen.

The results also show that there is pair wise congruence between two moderate personality types, namely R and I (0.84), this indicates that there is a match between Realistic and Investigative personality types where Realistic and Investigative personality types tend to be less sensitive to the social environment and choose to occupy themselves with the world and its own environment, the same type of work is also found in these two personality types, namely laboratory workers, scientists and mechanics. The next paired congruence was found in personality types E and S (0.82) this indicates that there is a match or suitability for Enterprising and Social personality types where Enterprising and Social personality types tend to have good verbal skills and are very good at influencing others. The types of jobs that are relevant to these two personality types are social workers, teaching staff, lawyers, and tour guides. The next paired congruence was found in personality types I and A (0.88) this indicates that there is a match or suitability for the Investigative and Artistic personality types where these personality types tend to have similarities in abilities that are deeper in artistic expression and have high artistic abilities. The types of work that are relevant to these two personality types are architects and decorators. The next paired congruence was found in personality types C and R (0.76) this indicates that there is a match or suitability for Conventional and Realistic personality types where these personality types tend to have similarities in verbal and structured abilities, combinations of individuals with this personality type tend to be able to speak in a structured and orderly manner. The types of jobs that are relevant to individuals who have this combination of personalities are secretaries, reporters, and bank employees.

In addition to moderate paired congruence, minor pair wise congruence was also found, where in this congruence there are some similarities but do not have a dominant tendency between one another so that the Holland RIASEC hexagonal is depicted with opposite congruence with a lower correlation value than moderate congruence. Among these minor congruence personality types, R and E (0.57) only have one tendency, namely the ability in verbal skills. Another minor congruence found in personality types R and S (0.59) only had one tendency, namely the ability in verbal skills. Besides the minor congruencies above, there are also several other minor congruencies such as C and I (0.56) and C and A (0.63). Moderate pair wise congruence as described above greatly affects the individual's ability to work, individuals with moderate pair wise congruence tend to be more accomplished and have a higher level of job satisfaction than individuals with minor congruence.

Conclusions

Based on the explanation above, it can be concluded that Holland's measuring instrument which has undergone linguistic development is declared valid and reliable by using a confirmatory factor analysis approach to measure the level of validity of the variables and using Cronbach's alpha to measure its reliability. The prediction of the reliability of the Indonesian version of Holland's six personalities using 178 students shows that Cronbach's alpha is quite large, between 0.601 and 0.699. RIASEC Holland's factor analysis identified six factors associated with the six Personalities. Examination of the constructs involved, along with expert psychologist discussion of each fact, showed that the variables had a clear relationship with the item's objective, offered input on construct validity for the Holland RIASEC, as well as the intercorrelations between the Holland Personality. shown to have a positive correlation. Where the information that can be obtained from the results of this factor analysis is $p = 0.26972$ and RMSEA = 0.02 which indicates this model is fit,

where the model is said to be fit if the p value > 0.05 and RMSEA < 0.05. This shows that the conformity of the empirical data with the RIASEC typology model which is used as a theoretical concept is at a valid level.

The dominant personality type in each study program tested is Informatics Engineering: dominant has a social personality type (71%), Information Engineering Education: dominant has an artistic personality type (80%), Remote Sensing Technology: has a social dominant personality type (74%). Suggestions that can be done in future research is to test this measuring instrument on groups of students who have undergone the field of lectures, so that it can be seen whether the results obtained are consistent or not. In addition, other criteria are also needed to ensure that the HOLLAND measuring instrument is compatible with similar test equipment. For example, such as the RMIB interest test, or other career selection tests. Even if possible, the participants' performance is also measured so that it can be compared with their interests.

References

Access, Open, and Terence J G Tracey. 2021. "Validity and Reliability Findings of Personal Globe Inventory Short Form Turkish." 4: 24–48.

Ahmed, K. A., Sharif, N., & Ahmad, N. (2017). Factors influencing students' career choices: empirical evidence from business students. *Journal of Southeast Asian Research*, *2017*(2017), 1-15.

Aljojo, Nahla, and Huda Saifuddin. 2017. "A Study of the Reliability and Validity of Holland's RIASEC of Vocational Personalities in Arabic." *American Journal of Information Systems* 5(1): 33–37.

Anggraini, Weni, Fandy Kurniawan, Susilawati Susilawati, and Afra Hasna. 2020. "Validitas Dan Realibilitas Instrumen Teori Pilihan Karir Holland Di Indonesia." *Bulletin of Counseling and Psychotherapy* 2(2): 68–73.

Ayriza, Y., Triyanto, A., Setiawati, F. A., & Gunawan, N. E. (2020). Exploring Children's Career Interests and Knowledge Based on Holland's Theory. *International Journal of Instruction*, *13*(4), 643-662.

Baiti, Rizki Diah, Sri Muliati Abdullah, and Novia Sinta Rochwidowati. 2017. "Career Self-Efficacy Dan Kesiapan Kerja Pada Mahasiswa Semester Akhir." *Jurnal Psikologi Integratif* 5(2): 128–41. http://ejournal.uin-suka.ac.id/isoshum/PI/article/view/1411/1212.

Cewińska, Joanna, Lena Grzesiak, Przemysław Kabalski, and Ewa Kusidel. 2017. "Holland's Personality Types versus Preferences in Accounting." *Zeszyty Teoretyczne Rachunkowości* (0): 23–60.

Chae, Han, and Soo Jin. 2015. "Personality Construct of Sasang Personality Questionnaire in an Adolescent Sample." 4: 29–33.

Darni, Resmi, Lativa Mursyida, Agariadne Dwinggo Samala, and Universitas Negeri Padang. 2021. "Career Exploration System (C-EXSYS) in Era Society 5 . 0 Based on Expert System." *Jurnal Teknologi Informasi dan Pendidikan* (491).

Darni, Resmi, Dony Novaliendry, and Ika Parma Dewi. 2020. "Aplikasi Expert System Pengembangan Karir Menggunakan Inventory Kepribadian Entrepreneurship." *JURNAL RESTI (Rekayasa Sistem dan Teknologi Informasi)* 4(1): 163–71. http://www.jurnal.iaii.or.id/index.php/RESTI/article/view/1626.

Fatmasari, Fatmasari, and Adi Supriyatna. 2019. "Pemilihan Dan Pengembangan Karier Berdasarkan Minat, Bakat Dan Kepribadian Remaja Menggunakan Forward Chaining." *JUITA : Jurnal Informatika* 7(1): 33.

Ganefri, G., Hidayat, H., Yulastri, A., & Yondri, S. (2021). The empirical analysis of production-based entrepreneurship training model, readiness and locus of control towards students entrepreneurship self efficacy. *International Journal of Research in Counseling and Education*, *5*(1), 56-61.

Hidayat, H., Tamin, B. Y., Herawati, S., Ardi, Z., & Muji, A. P. (2020). The Contribution of Internal Locus of Control and Self-Concept to Career Maturity in Engineering Education. *Int. J. Adv. Sci. Eng. Inf. Technol, 10*(6), 2282-2289.

Hidayat, H., Tasrif, E., Jaya, P., Anwar, M., Hadi, A., Budayawan, K., ... & Asmara, D. (2021). The Empirical Analysis of Industrial Work Challenges in the Industrial Revolution 5.0 Towards a Grade Point Average (GPA) for Electronic Engineering Education Students. *International Journal of Online & Biomedical Engineering*, *17*(9).

Jackson, D., & Wilton, N. (2017). Career choice status among undergraduates and the influence of career management competencies and perceived employability. *Journal of Education and Work*, *30*(5), 552-569.

Jati, A. S., Kusrini, K., & Al Fatta, H. (2019). Pengembangan Prototype Tes Psikologi Perencanaan Karir Siswa SMA. *Creative Information Technology Journal*, *5*(1), 58-70.

Jemini-Gashi, Liridona, and Dashamir Bërxulli. 2017. "Personality Types, Career Choice and Career Certainty Among High School Students." *International Journal of Teaching & Education* V(1): 25–35.

Kahveci, Murat, Ajda Kahveci, Nasser Mansour, and Maher Mohammed Alarfaj. 2016. "Construct Validity and Reliability Measures of Scores from the Science Teachers' Pedagogical Discontentment (STPD) Scale." *Eurasia Journal of Mathematics, Science and Technology Education* 12(3): 549–58.

Kazi, A. S., & Akhlaq, A. (2017). Factors Affecting Students' Career Choice. *Journal of Research & Reflections in*

Education (JRRE), *11*(2).

Kemboi, Rebecca J Kimongo, Nyaga Kindiki, and Benard Misigo. 2016. "Relationship between Personality Types and Career Choices of Undergraduate Students: A Case of Moi University, Kenya." *Journal of Education and Practice* 7(3): 102–12.

Kementerian Ketenagakerjaan RI. 2021. 1 *Ketenagakerjaan Dalam Data 2021*. https://satudata.kemnaker.go.id/files/2019 BUKU KETENAGAKERJAAN DALAM DATA_1605501203.pdf.

Kwanyuen, R., Lawthong, N., & Pasiphol, S. (2021). Psychometric properties and confirmatory factor analysis of nurse interest inventory towards nursing department selection as a model for nurse selection into nursing departments: An application of Holland's vocational interest measurement. *Kasetsart Journal of Social Sciences*, *42*(2), 313-318.

Martončik, Marcel et al. 2020. "Validity of Holland's Theory in Adolescence: Evidence from a Slovak Sample." *International Journal for Educational and Vocational Guidance* 20(3): 543–65.

Moafian, Fatemeh, Shahla Ostovar, Mark D. Griffiths, and Mansooreh Hashemi. 2019. "The Construct Validity and Reliability of the 'Characteristics of Successful Efl Teachers Questionnaire (Coseflt-q)' Revisited." *Porta Linguarum* 2019(31): 53–73.

Morgan, Brandon, and Gideon P. de Bruin. 2018. "Structural Validity of Holland's Circumplex Model of Vocational Personality Types in Africa." *Journal of Career Assessment* 26(2): 275–90.

Muspawi, Mohamad, and Ayu Lestari. 2020. "Membangun Kesiapan Kerja Calon Tenaga Kerja." *Jurnal Literasiologi* 4(1): 111–17.

Nauta, Margaret M. 2010. "The Development, Evolution, and Status of Holland's Theory of Vocational Personalities: Reflections and Future Directions for Counseling Psychology." *Journal of Counseling Psychology* 57(1): 11–22.

Nistal, María Teresa Fernández, Jairo Keven Mora Soto, and Frannia Aglaé Ponce Zaragoza. 2019. "The Structural Validity of Holland's and Gati's RIASEC Models of Vocational Interests in Mexican Students." *Electronic Journal of Research in Educational Psychology* 17(49): 707–30.

Pässler, Katja, and Benedikt Hell. 2020. "Stability and Change in Vocational Interests from Late Childhood to Early Adolescence." *Journal of Vocational Behavior* 121(June).

Phan, W. M. J., & Rounds, J. (2018). Examining the duality of Holland's RIASEC types: Implications for measurement and congruence. *Journal of vocational behavior*, *106*, 22-36.

Pozzebon, Julie A., Beth A. Visser, and Anthony F. Bogaert. 2015. "Vocational Interests, Personality, and Sociosexuality as Indicators of a General Masculinity/Femininity Factor." *Personality and Individual Differences* 86: 291–96.

Rosliani, Nadia, and Jati Ariati. 2016. "Hubungan Antara Regulasi Diri Dengan Kecemasan Menghadapi Dunia Kerja Pada Pengurus Ikatan Lembaga Mahasiswa Psikologi Indonesia (Ilmpi)." *Jurnal Empati* 5(4): 744–49.

Wasylow, Beth et al. 2006. "The Impact of Vocational and Personality Factors on Career Development of First-Year College Students." *Vistas: Compelling perspectives on counseling 2006.*: 219–22.

Zainudin, Zaida Nor et al. 2020. "The Relationship of Holland Theory in Career Decision Making: A Systematic Review of Literature." *Journal of Critical Reviews* 7(9): 884–92.