Sosioedukasi
JURNAL ILMIAH ILMU PENDIDIKAN DAN SOSIAL
ISSN: 2086-6135 E-ISSN: 2541-612x
Volume 15 No. 2. Juni 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

DEVELOPMENT OF CAREER READINESS ASSESSMENT TOOL BASED ON INTERESTS, POTENTIAL, AND SOFT SKILLS FOR VOCATIONAL HIGH SCHOOL STUDENTS

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ARTICLE HISTORY
Received : 20-01-2026
Revised : 07-02-2026
Accepted : 25-04-2026

KEYWORDS
Assesment tool
Career readiness
Development
Soft skills
Vocational high school

ABSTRACT
This study aims to develop a career readiness instrument for vocational high school students in the Software Engineering and Computer and Network Engineering programs. The instrument was developed by adapting three main constructs: career interests, individual potential, and soft skills. This study employed an instrument development approach consisting of literature review, formulation of indicators and items, expert validation, and testing of validity and reliability. Interest indicators were adapted from Holland's RIASEC theory, potential indicators from Gardner's Multiple Intelligences, and soft skills indicators from work competency concepts relevant to industry needs. The instrument was validated by three experts, including one guidance and counseling expert and two industry practitioners (CEO and HR). After revision, the instrument was pilot-tested on 30 vocational students. The validity test showed that most items were valid, while several items were eliminated due to low correlation values. Reliability testing indicated high internal consistency, with Cronbach's Alpha values of 0.946 for interest, 0.929 for potential, and 0.982 for soft skills. These results indicate that the developed instrument is valid and reliable for measuring students' career readiness and can be used to support career guidance services in the field of information technology.

INTRODUCTIONS

Vocational education plays a crucial role in preparing students to enter the workforce competently and with a clear career path after completing their education (Kovalchuk et al., 2022). Vocational high schools are designed to equip students with technical skills in their respective fields of study. However, many vocational high school students

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still struggle to choose a career path that aligns with their interests and potential (Luo et al., 2024). This situation indicates that the process of career exploration and planning among students is not yet functioning optimally.

In the career decision-making process, students require a solid understanding of various aspects related to themselves, such as interests, potential, and personal skills (Aryawan, 2023). The selection of these three aspects is based on the consideration that interests, potential, and soft skills are key, complementary components in assessing a student's career readiness. Interests indicate an individual's inclination toward specific occupational fields; potential describes the ability to perform those jobs; while soft skills represent an individual's readiness to adapt and work in a professional environment (Aini & Purba, 2022; Mukhlason et al., 2020).

One widely used approach to understanding individual career interests is the RIASEC theory developed by Holland (Wei, 2024). This theory explains that a person's interest in work can be classified into six work personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. This model has been widely used as a foundation for developing career interest instruments because it effectively captures an individual's inclination toward specific types of work activities.

In addition to career interests, an individual's potential is also a critical factor in determining their success in a particular field of work. Individual potential can be understood as the ability or intelligence a person possesses to perform various activities effectively (Setiyana et al., 2024). The theory of Multiple Intelligences explains that individuals possess various types of intelligence that develop differently in each person. In the context of vocational education, understanding students' potential is crucial to helping them identify career fields that align with their abilities (Davis et al., 2020).

In addition to interests and potential, another equally important aspect of career readiness is soft skills. Soft skills are non-technical skills related to communication, collaboration, leadership, and problem-solving abilities (Robles, 2012). Various studies indicate that soft skills are among the primary competencies required by the workforce and significantly influence an individual's success in a professional environment. Therefore, the assessment of soft skills should also be an integral part of the process for evaluating students' career readiness.

Although various instruments for assessing interests, potential, and soft skills have been developed, most of these instruments remain general in nature and have not been specifically tailored to the characteristics of particular fields of study in vocational high schools (Morgan, 2021). This situation limits the ability to obtain a more context-specific picture of students' career readiness in information technology fields such as Software Engineering and Computer and Network Engineering.

The availability of instruments specifically designed to measure the career readiness of Vocational High School students in the field of information technology remains relatively limited (López et al., 2023). The available instruments are generally general in nature and do not yet account for the characteristics of specific vocational programs. Yet, each field of expertise has distinct competency requirements, necessitating instruments that are more specific and relevant to the characteristics of that field.

The Software Engineering and Computer and Network Engineering programs are two fields of expertise whose job characteristics are closely tied to digital technology and computer system development. Therefore, an instrument is needed that can identify students' interests, potential, and soft skills relevant to the characteristics of these fields (Waikar et al., 2024). The development of an appropriate instrument is expected to provide a more accurate picture of students' career readiness in the field of information technology.

Based on these issues, this study aims to: (1) develop a career readiness instrument for vocational high school students in the Software Engineering and Computer and Network Engineering programs through the adaptation of constructs related to interests, potential, and soft skills; and (2) analyze the validity and reliability of the developed career readiness instrument. The resulting instrument is expected to serve as a tool for identifying students' career readiness and to form the basis for the development of more targeted career guidance services for vocational high school students.

Sosioedukasi
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METHOD

This study employs an instrument development approach aimed at producing a valid and reliable career readiness instrument for vocational high school students. The instrument was developed by adapting several constructs related to student career readiness, namely interests, potential, and soft skills. The instrument development procedure in this study refers to the stages of scale development, which include: (1) construct identification, (2) indicator formulation, (3) instrument item formulation, (4) expert validation, and (5) testing of the instrument's validity and reliability. These stages align with the instrument development procedures proposed by Manu et al., (2021), who state that instrument development is carried out through the process of construct conceptualization, item development, expert validation, and instrument quality testing.

This study was conducted among vocational high school students in the Software Engineering and Computer and Network Engineering programs. The selection of these programs was based on the consideration that both fields involve work characteristics related to information technology development, thus requiring an understanding of interests, potential, and soft skills relevant to the technology sector (Ngurah & Laksana, 2024).

The initial stage of the research involved a literature review to identify constructs and indicators relevant to students' career readiness. Interest indicators were adapted from the RIASEC model, potential indicators were adapted from Multiple Intelligence theory, while soft skills indicators were adapted from the concept of work competencies widely used in work readiness research. Based on these indicators, the researcher developed an instrument framework, which was then used as the basis for formulating statement items.

The instrument was then subjected to an expert validation process to assess the appropriateness of the indicators, the clarity of the item wording, and the relevance of the items to the constructs being measured. The instrument validation was conducted by three validators: one guidance and counseling expert and two industry experts, who served as Chief Executive Officer (CEO) and Human Resources (HR) Manager at a technology company. The involvement of industry experts aimed to ensure that the work readiness and soft skills indicators measured in the instrument align with the competency requirements needed in the workplace.

Feedback from the validators served as the basis for revising the instrument before it was pilot-tested with respondents (Jokinen et al., 2024). After the revision process, the instrument was then pilot-tested on students in the Software Engineering and Computer and Network Engineering programs to assess the quality of the instrument items. The pilot test was conducted on 30 vocational high school students in the Software Engineering and Computer and Network Engineering programs who were not part of the main research subjects.

Data analysis was conducted through item validity testing and instrument reliability testing. Validity testing was performed by correlating the score of each item with the total score to determine the item's ability to measure the intended construct. Furthermore, reliability testing was conducted using Cronbach's Alpha coefficient to determine the instrument's level of internal consistency. The instrument was deemed reliable if the reliability coefficient indicated a good level of consistency.

RESULT AND DISCUSSIONS

This section presents the results of the instrument development process and discusses the validity and reliability of the developed career readiness instrument. The findings are interpreted based on theoretical frameworks and previous studies related to career readiness assessment.

Development of the Career Readiness Instrument

The development of the career readiness instrument in this study was conducted by adapting three main constructs considered to influence students' career readiness: career interests, individual potential, and soft skills. These three constructs were selected based on theoretical reviews of the factors influencing career decision-making and individuals' readiness to enter the workforce (Darni et al., 2025).

The first construct used in the instrument development is career interest. Career interest was adapted from the RIASEC theory developed by Holland, which classifies individual interests into six work personality types: realistic, investigative, artistic, social, enterprising, and conventional (Bullock-Yowell & Reardon, 2024). These six types

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served as the foundation for developing the instrument's interest indicators because they effectively describe individuals' tendencies toward specific work activities. In the context of this study, the interest indicators were tailored to the characteristics of jobs in the information technology field, specifically within the Software Engineering and Computer and Network Engineering programs. This adaptation focused on activities related to the use of technological devices, technical problem-solving, system development, and collaboration on technology projects.

The second construct used is individual potential. Potential in this study is adapted from the concept of Multiple Intelligences proposed by Gardner, which states that every individual possesses various types of intelligence that develop differently. In this study, individual potential is measured through several dimensions of intelligence relevant to learning activities in vocational high schools, namely linguistic, logical-mathematical, visual-spatial, kinesthetic, musical, interpersonal, intrapersonal, and naturalistic intelligence. The selection of these dimensions is based on the consideration that students' cognitive and social abilities are important aspects in supporting their success in the field of technology (Morgan, 2021).

The third construct used in the development of the instrument is soft skills. Soft skills are non-technical skills related to interpersonal abilities, work attitudes, and an individual's ability to adapt to the work environment. In this study, soft skills were adapted from the concept of work competencies, which is frequently used in research on work readiness. Some of the soft skills indicators used in this instrument include integrity, communication, courtesy, responsibility, interpersonal skills, positive attitude, professionalism, flexibility, teamwork, and work ethic. These indicators were selected because they are considered relevant to the competencies required in the workplace, particularly in the field of information technology (Robles, 2012).

Based on these three constructs, the researcher then developed an instrument matrix used as the foundation for developing statement items. The matrix was developed by aligning the indicators with the characteristics of vocational high school students in the Software Engineering and Computer and Network Engineering programs. The instrument framework includes the variables being measured, indicators, sub-indicators, and the number of statement items developed for each indicator. The career readiness instrument frameworks used in this study are presented in Tables 1–3 below:

Table 1 Career Interest Test Framework

No	Aspect	Measurement Indicator	Number of Items
1	Realistic	Interest in practical and technical work	4
2	Investigative	Interest in analysis and problem-solving	4
3	Artistic	Enjoys creative and expressive activities	4
4	Social	Interest in analysis and problem-solving	4
5	Enterprising	Enjoys leading and making decisions	4
6	Conventional	Enjoys organized and administrative work	4
	Total		24

Source: (Murwani et al., 2020)

Table 2 Potential Test Framework

No	Aspect	Measurement Indicator	Number of Items
1	Linguistic(Verbal)	Language skills	4
2	Logical-Mathematical	Ability to think rationally and solve problems logically	4
3	Visual-Spatial	Ability to think rationally and logically	4
4	Kinesthetic-Physical	Ability to use the body to perform productive activities	4
5	Musical	Ability to understand visual patterns	4
6	Interpersonal	Ability to understand and cooperate with others	4
7	Interpersonal	Use of the body in productive activities	4
8	Naturalist	Interest in the environment and living things	4

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Volume 15 No. 2. Juni 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

	Total	32

Source: (Yu et al., 2021)

Table 3 Soft skills Test Framework

No	Aspect	Measurement Indicator	Number of Items
1	Integrity	Honesty in the workplace	2
2	Communication	The ability to listen and respond appropriately	2
3	Courtesy	The use of ethics and proper etiquette in communication	2
4	Responsibility	Discipline and commitment to work	2
5	Interpersonal Skills	Empathy and adaptability in workplace relationships	2
6	Positive Attitude	Enthusiasm and a strong work ethic	2
7	Professionalism	Adherence to professional standards and ethics	2
8	Flexibility	Openness to learning and new ideas	2
9	Teamwork	Active participation in the team	2
10	Work Ethic	A strong work ethic and personal initiative	2
	Total		20

Source: (Robles, 2012)

The development of statement items in the instrument was conducted using a five-point Likert scale that measures respondents' level of agreement with each statement. The items were formulated with careful attention to linguistic clarity and contextual relevance to the experiences of vocational high school students, ensuring that the statements provided could be easily understood by respondents (Dolhopolov et al., 2022).

This process of construct adaptation and item development resulted in a preliminary instrument consisting of a number of statements representing each indicator of the variables of interest, potential, and soft skills (Fauziah et al., 2022). The preliminary instrument was then subjected to an expert validation stage to assess construct validity and item suitability before being pilot-tested with respondents.

Results of the Validity and Reliability of the Career Readiness Instrument

The validated instruments include the interest questionnaire, the potential questionnaire, and the soft skills questionnaire. The validation process was conducted by experts with academic backgrounds and professional experience relevant to the constructs being measured (Noviana et al., 2019). The interest and potential questionnaires were validated by guidance counselors with a background in psychology. This validation focused on the alignment of indicators with interest and potential theories, the clarity of statement wording, the appropriateness of language for the characteristics of vocational high school students, and the representation of the psychological aspects intended to be measured (Truong et al., 2021).

Meanwhile, the soft skills questionnaire was validated by Human Resource Development (HRD) practitioners who also have a background in psychology. The validation of the soft skills instrument focused on the relevance of the items to the needs of the workplace, the alignment of the soft skills indicators with the industry context, and the clarity and accuracy of the statements in describing the non-technical competencies required of vocational high school students (Ogawa, 2023).

Expert validation results indicated that, in general, the items in the instrument aligned with the constructs being measured, although there were some suggestions regarding editorial improvements and refining the indicators. These expert suggestions were subsequently used as the basis for revising the initial instrument before it was pilot-tested with respondents and analyzed using validity and reliability tests via SPSS.

After the revision, the instrument was administered to students who were not part of the study sample. Validity testing was conducted using the item–total correlation technique, examining the value of the Corrected Item–Total Correlation coefficient. The decision criterion in this validity test was that an item was deemed valid if the calculated r value was greater than the table r value. With a sample size of 30 students and a significance level of 5%, the table r value obtained was >0.361 (Zhou et al., 2024).

Sosioedukasi
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Volume 15 No. 2. Juni 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

Development of the Interest Assessment Instrument

The interest assessment instrument was developed by adapting the RIASEC theory proposed by Holland. The initial interest instrument consisted of 36 statements developed based on 6 indicators and 12 sub-indicators corresponding to the characteristics of each RIASEC type. Based on the results of the validity test analysis, most of the items in the interest instrument showed item–total correlation values above the table r value, with correlation coefficients ranging from 0.373 to 0.796. This indicates that these items are capable of representing the interest construct being measured and are considered valid.

The validity test results indicate that two items have item–total correlation values below the table r value: item number 3 (sub-indicator of interest in the use and assembly of technical devices) with a correlation value of 0.102 and item number 5 (sub-indicator of interest in technical field practice activities) with a correlation value of 0.120. The correlation values for these two items were below the established minimum threshold, so they were deemed invalid. Therefore, these items need to be eliminated to ensure the interest instrument has a higher level of measurement accuracy.

Reliability was analyzed using Cronbach's Alpha coefficient via SPSS. Based on the reliability analysis results, a Cronbach's Alpha value of 0.946 was obtained with a total of 34 items. This Cronbach's Alpha value falls into the very high category, so it can be concluded that the interest instrument has very good reliability and is consistent in measuring the construct of student interest. The statistical results of the reliability test can be seen in Table 4.

Table 4 Cronbach's Alpha Value of the Interest Instrument

Reliability Statistics	
Cronbach's Alpha	N of Items
0,946	34

Based on the results of the reliability test of the interest instrument (RIASEC) using SPSS, it was found that 34 items met the reliability criteria. For the Realistic indicator, items 3 and 5 were deemed unreliable. These results indicate that the developed interest instrument possesses a good level of reliability and can therefore be used to identify the career interest tendencies of vocational high school students in the field of information technology.

Development of the Potential Assessment Instrument

The potential assessment instrument was developed by adapting Gardner's theory of Multiple Intelligences. This theory views individual potential as a multidimensional ability, making it suitable for describing variations in students' potential when recommending careers. The initial potential instrument consisted of 32 items developed based on 8 aspects of intelligence and 16 sub-indicators.

The results of the potential instrument's validity test showed that the majority of items had item–total correlation values above the table r value, with correlation coefficients ranging from 0.371 to 0.867. This indicates that the majority of items are capable of accurately measuring the construct of student potential and are deemed valid.

The reliability test results showed a Cronbach's Alpha value of 0.929, which falls into the very high reliability category. This value indicates that the potential instrument has good internal consistency and can be used as a tool to measure student potential in the context of career readiness. The statistical results of the reliability test can be seen in Table 5.

Table 5 Cronbach's Alpha Values for the Potential Instrument

Reliability Statistics	
Cronbach's Alpha	N of Items
0,929	29

The results of the above analysis indicate that the final valid and reliable instrument consists of 29 items. There are three items with item–total correlation values below the critical r value, and thus deemed invalid: item number 4 with a correlation value of 0.349, item number 20 with a correlation value of 0.196, and item number 21 with a

Sosioedukasi
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correlation value of 0.357. The correlation values of these three items do not meet the established validity criteria; therefore, these items must be eliminated.

Development of the Soft Skills Assessment Instrument

The soft skills assessment instrument was developed to measure students' non-academic abilities that play a crucial role in career readiness, such as communication skills, teamwork, and responsibility. This instrument was developed based on a review of the literature on soft skills relevant to the needs of the workforce and students' career development. The initial soft skills instrument consisted of 40 statements covering 10 aspects and 20 sub-indicators.

All items in the soft skills instrument exhibit item–total correlation values above the critical r-value. The correlation coefficients obtained range from 0.568 to 0.942, indicating that each item has a strong to very strong relationship with the instrument's total score.

These results indicate that, statistically, all items in the soft skills instrument are valid and capable of representing the measured soft skills construct. During the instrument development phase, not all valid items were included in the system. Item selection was based on indicator relevance, construct representativeness, and instrument efficiency to ensure the instrument was not overly lengthy and remained focused on soft skills aspects relevant to the objectives of the career guidance system development. The soft skills items used in the final instrument total 20 items, namely items numbered: 2, 3, 5, 7, 9, 11, 13, 16, 17, 19, 21, 24, 26, 27, 30, 32, 33, 35, 37, and 39. The statistical results of the reliability test can be seen in Table 6.

Table 6 Cronbach's Alpha Values for the Soft Skills Instrument

Reliability Statistics	
Cronbach's Alpha	N of Items
0,982	20

Based on the results of the reliability analysis, a Cronbach's Alpha value of 0.982 was obtained for the 20-item scale. This Cronbach's Alpha value falls into the very high category, indicating that the soft skills instrument possesses excellent reliability and consistency in measuring students' soft skills. Consequently, the soft skills instrument used in this study is reliable and suitable for use as a data collection tool within an artificial intelligence-based career guidance system.

CONCLUSION

Based on the instrument development process, which involved literature review, indicator formulation, statement item development, expert validation, and validity and reliability testing, an instrument with good measurement quality was obtained. The results of the validity test showed that the majority of the statement items in the developed instrument had item–total correlation values above the table r value, thus being deemed valid. In the interest instrument adapted from the RIASEC model, two items did not meet the validity criteria and were therefore eliminated, resulting in 34 valid items. The potential instrument adapted from the Multiple Intelligences concept yielded 29 valid items after the elimination of several items that did not meet the validity criteria. Meanwhile, all items in the soft skills instrument were deemed valid; however, in the final stage, only 20 items were selected for the final instrument based on considerations of indicator representativeness and instrument efficiency.

Reliability test results indicate that all three instruments exhibit very high internal consistency. The interest instrument had a Cronbach's Alpha value of 0.946, the potential instrument 0.929, and the soft skills instrument 0.982. These values indicate that the developed instruments possess very high reliability, making them suitable for use as tools to measure the career readiness of vocational high school students.

Thus, the career readiness instruments developed in this study can be used to identify students' interest tendencies, potential, and soft skills to support the career planning process in the field of information technology. These instruments are expected to serve as a foundation for developing more targeted career guidance services for vocational high school students, particularly in the Software Engineering and Computer and Network Engineering programs.

Sosioedukasi
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Volume 15 No. 2. Juni 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

Future research could test this instrument on a larger sample size and conduct a more in-depth construct validity analysis to strengthen the instrument's psychometric quality.

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