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Empowering career exploration: Designing a vocational interest instrument for junior high school students

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ABSTRACT

Career exploration is a critical developmental task during adolescence; however, many junior high school students lack access to effective tools that accurately identify their vocational interests, thereby limiting informed career decision-making. This study addresses the gap by developing the Vocational Interest Scale, grounded in Holland's RIASEC model, to support career exploration among junior high school students and establish a standardized framework extendable to senior high and vocational school students for higher education guidance. Employing a research and development methodology, the study encompassed a theoretical review of vocational interest constructs and previous instruments, instrument design with expert evaluations, pilot testing, and psychometric validation. The resultant 24-item scale, which measures the six RIASEC domains—Realistic, Investigative, Artistic, Social, Enterprising, and Conventional—was validated via Confirmatory Factor Analysis using Structural Equation Modeling (LISREL 8.80). Results demonstrated strong factor loadings (0.61–0.89), construct reliability of 0.80, and excellent model fit indices (RMSEA = 0.039), confirming the scale's validity and reliability. This instrument effectively supports students' career decision-making based on vocational interests and shows potential generalizability across secondary education levels, thus filling a critical gap in vocational assessment and enhancing career guidance practices for adolescents.

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INTRODUCTION

Hesitation and difficulty in making choices are often experienced by junior high school students, especially when they are about to graduate from junior high school (Dublin et al., 2020) and decide which high school to enter, due to the lack of effort from the guidance and counsellor teacher who should be able to provide them with guidance (Lai-Yeung, 2014). Career development needs to be carried out in a targeted manner, and to uncover the problems of students' needs (Farozin et al., 2022). Effective guidance and counseling services should ideally offer personalized support, information about various high school options, and tools to help students assess their abilities and aspirations. When these services are insufficient or absent, students may struggle to make informed decisions, potentially leading to suboptimal educational choices that do not align with their interests or capabilities.

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The study by (Iswahyudi et al., 2023) showed that the lack of direction from the school and the lack of efforts to explore students' career orientation, or career exploration were the main causes of their confusion in making choices (Pham et al., 2024). Based on the confessions of guidance teachers, homeroom teachers, and/or parents of students, their inability to provide objective information to students was due to their difficulties in conducting career exploration. According to several guidance and counseling teachers, this inability was due to the large number of students who had to be explored and the lack of adequate career exploration tools (Yaghi & Alabed, 2021).

Deciding on the next educational level after junior high school is a pivotal moment that significantly impacts students' future career paths. This choice affects not only their academic journey but also their overall personal growth and long-term career prospects. However, many students find this decision-making process overwhelming due to their limited understanding of their own interests and skills, as well as a lack of access to dependable information and expert advice. Consequently, they often seek guidance from schools or other institutions, where the quality and consistency of support can vary significantly. This makes it challenging for students to confidently select options that align with their strengths and future aspirations.

Psychological tools designed to assess students' maturity in making career choices can assist them in selecting a major that aligns with their career goals (Purnama & Ernawati, 2021). However, the availability of psychological measurement tools that can provide precise and effective assessments to support students' educational and career decision-making is limited. Existing instruments often lack developmental suitability and practical applicability for junior high school students, thereby constraining educators and counselors' ability to offer targeted and evidence-based guidance. Consequently, there is a critical need for practical and psychometrically sound measurement tools that can facilitate educational consultants and teachers in delivering initial counseling services to students. Such instruments must be capable of capturing comprehensive information regarding students' personal characteristics and occupational preferences, which are essential for evaluating the congruence between student profiles and potential career pathways.

Holland's vocational personality theory, grounded in a hexagonal model comprising six domains—Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC)—is one of the most well-established frameworks in career development research. This theory provides a coherent and empirically validated framework that links individual differences in personality to compatible occupational environments. The development of a vocational interest instrument based on Holland's model offers a theoretically robust and practical tool for educational practitioners to implement effective career counseling. Such an instrument addresses a significant gap in existing resources by enabling the early identification of student interests and aptitudes, thereby enhancing the precision and relevance of career guidance provided within the educational context. Ultimately, this approach supports informed decision-making processes that align students' inherent characteristics with suitable educational and occupational trajectories.

Previous research on vocational interest instruments for high school students has demonstrated the utility of tools based on Holland's RIASEC model in assessing students' vocational preferences and guiding career decision-making. Inventories such as the Vocational-Interest Inventory (VII) demonstrate moderate reliability and validity, but often require a good reading ability, which limits accessibility for some students (Bagaskara et al., 2024). Studies have also highlighted the influence of gender (Hedrih, 2023) and achievement on vocational interests (Dzikri & Maknun, 2022), although sample limitations and homogeneity affect generalizability. Innovative approaches utilising pictorial stimuli have enhanced engagement among adolescents, but require further validation (Slot et al., 2021). Recent studies emphasize the multiplicity of vocational interests, showing that many students exhibit broad interest profiles that impact educational and career track decisions (Slot et al., 2021). Limitations across studies include

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moderate internal consistency, small or non-diverse samples, and instruments that may not fully address students' multiple interests or accommodate varying reading levels. These findings underscore the importance of further instrument development to enhance precision, inclusivity, and cultural relevance in vocational interest assessments for high school students, thereby facilitating targeted career guidance and improving study motivation and outcomes (Bagaskara et al., 2024; Schelfhout et al., 2019).

The lack of sufficient career exploration resources for junior high school students (Grace et al., 2024) presents a significant obstacle to their educational development, particularly as they approach the transition to high school. This shortage of tools leaves many young adolescents unprepared to make well-informed decisions regarding their future academic and career paths. Without adequate guidance and resources, students may struggle to identify their interests, strengths, and potential career options, leading to uncertainty and suboptimal choices regarding high school courses and extracurricular activities (Erdisna et al., 2019). This deficiency in career exploration resources can have far-reaching consequences for students. Students may enter high school without a clear sense of direction, potentially missing opportunities to participate in specialized programs or courses that align with their interests and abilities. Furthermore, the scarcity of comprehensive career exploration tools can exacerbate existing inequalities, as students from disadvantaged backgrounds often have less access to information and guidance about viable career paths. Addressing this issue requires collaborative efforts among educators, policymakers, and community stakeholders to develop and implement effective career exploration programs tailored to the specific needs and developmental stages of junior high school students.

This study uses Holland's concept of interpreting vocational interest, namely, vocational interest as an expression of personality formed by the interaction between oneself and the environment that encompasses the work one likes, which is manifested in work personality, choice of school major, interests or hobbies, preferred activities, and tendencies in choosing all things. Vocational interest as an expression of personality is formed by the interaction between the individual and the environment that encompasses the work or career he likes, which will be manifested in work personality, choice of school major, interests or hobbies, activities that are liked, and tendencies in choosing all things (Lukman et al., 2020). Everyone can be classified according to the extent to which they approach one of the six personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC). The more a person fits one of these six types, the more they display the characteristics and behavioral patterns typical of that type of person. Each type is theoretical or ideal, resulting from interactions between internal and external factors. Based on this interaction, young individuals learn to prefer certain activities, which gives rise to a strong interest that fosters specific abilities and skills. The combination of interests and abilities creates a personal disposition that influences how one interprets, behaves, thinks, and acts in specific ways. For example, someone with a social type is more sensitive to the needs of others and is therefore more likely to enter an occupational environment that involves elements of social services, such as nursing, teaching, social work, or religious leadership. Vocational interest is an important aspect of personality that provides insight when choosing a job, as its predictive ability is more accurate than that of talent (aptitude).

This theory is based on four key assumptions (Holland, 1997): First, everyone can be classified according to the degree to which they correspond to one of the six personality types. Second, six environmental models exist, each characterized by a dominant personality type and defined by its physical attributes, challenges, opportunities, and conditions. Third, individuals are inclined to seek environments that facilitate the development of their skills and capabilities, the expression of their attitudes and values, and the acquisition of effective problem-solving strategies that align with their characteristics. The congruence between a particular personality type and a compatible environment fosters occupational harmony and homogeneity, enabling

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self-development within a specific vocational setting and ultimately leading to satisfaction. Fourth, attitude is conceptualized as the manifestation of the interaction between personality and environment. The degree of fit between an individual and their environment influences educational major selection, academic stability, satisfaction, and achievement. Consequently, a vocational interest instrument can be constructed to explore students' interests and evaluate their career preferences based on their experiences and environmental interactions (Anwar, 2021), thereby providing guidance for students.

Previous studies reported that a person's career and work success continuously develop throughout their life (Tsani & Adiati, 2025) because self-concept evolves in stages over time (Kiling & Kiling, 2015). Career planning typically begins in junior high school, where students in Indonesia can choose to continue their education in either a general high school or a vocational school (Haq & Farida, 2019). Both paths are freely chosen to align with individual interests and career goals. Corresponding with career development, junior high school students need to understand themselves well and engage in effective planning. In this process, guidance and counseling teachers play an essential role in helping students explore their self-concept and future career options. Simultaneously, companies invest in their employees' growth through career development programs to support ongoing professional advancement. One study revealed that interventions in career education affect students' career development and learning success in school (Choi et al., 2015). Another study suggested that career development can be initiated early through a technology-based career development curriculum (Edwin & Prescod, 2018).

Reports have shown that students need to develop themselves through education, and their future work is supported by various factors (Donald et al., 2018). Self-development is also influenced by personal experiences, motives, tendencies, and the social and cultural environments surrounding students (Spiel et al., 2018). Since students spend most of their time at school (Parinduri, 2014), teachers and the school environment play a crucial role in supporting their identity recognition (Dirsa et al., 2022) and the social roles they will assume in their careers (Wang et al., 2022).

Interest in vocational choice and career development has been a central theme in psychological research for decades, reflecting its critical role in individual well-being and professional fulfillment. Holland's theory of vocational personalities and work environments offers a comprehensive framework that posits that individuals are naturally drawn to occupations that align with their personal interests, abilities, and personality traits. This theory highlights the dynamic interaction between a person's personality type and their work environment as a fundamental determinant of job satisfaction and career success. Importantly, it underscores that a clear understanding of one's vocational interests can be a more reliable predictor of suitable career paths than traditional aptitude tests, thereby guiding more informed and satisfying career decisions.

According to Holland's theory, an individual's personality is shaped by a combination of genetic predispositions and environmental influences, which together form unique psychological characteristics that interact with their surroundings (Amalianita & Putri, 2019). These personality types represent inherent traits or dispositions that influence preferences for certain environments and activities. In line with this, Pilosusan et al., (2021) emphasize that people tend to seek work environments that reflect their own personality traits, suggesting a natural affinity between personality and occupational settings. Additionally, Patton and McMahon, (2021) affirm that Holland's theory establishes a systematic linkage between personality types and vocational choices, providing a useful tool for understanding how individuals can achieve better career alignment and satisfaction through recognition of this relationship.

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The aims of this research were twofold: first, to develop a vocational interest instrument grounded in Holland's typology to support career exploration among junior high school students; and second, to establish an interest typology for senior high school and vocational high school students that can serve as a standardized reference for higher education recommendations. Hence, this instrument has the potential to facilitate effective career guidance by aligning students' interests with appropriate educational pathways and career opportunities, thereby enhancing the precision and relevance of career counseling interventions.

RESEARCH METHOD

This study employed a mixed-methods approach, combining qualitative and quantitative techniques. The qualitative phase involved validating the vocational interest instrument through expert judgment, where five specialists in measurement and psychology critically evaluated and agreed upon the conceptual framework, item formulation, and aspects of vocational interest developed by the researchers based on theoretical foundations. The quantitative phase involved the systematic collection of survey data from participants, which was then analyzed to evaluate the psychometric properties of the vocational interest instrument. This process enabled a rigorous statistical examination of the instrument's validity and reliability, based on empirical evidence gathered from the target population.

This study was conducted in several senior high schools in Surakarta, Boyolali, Pacitan, and Purwokerto, with 906 respondents. All participants expressed their eagerness and volunteered to complete the instrument. To ensure confidentiality, the information and data gathered were treated and stored anonymously. Furthermore, the participants were duly informed of the unconditional right to withdraw at any time.

Confirmatory factor analysis (CFA) was conducted using the LISREL 8.8 software program. A model is considered a good fit if it meets three key criteria: the chi-square value divided by degrees of freedom is less than 2, the p-value (probability of occurrence) is greater than 0.05, and the Root Mean Square Error of Approximation (RMSEA) value is less than 0.08 (Mueller, 1996). To assess the suitability of the vocational interest scale developed according to the hexagonal model of Holland's theory, multidimensional scaling (MDS) analysis was performed (Tang, 2009; Einarsdóttir et al., 2010). MDS was chosen because it has been demonstrated as an effective method for evaluating instrument validity, particularly for response formats such as Likert scales (Khademi, 2023). Widely used in behavioral sciences, MDS has enhanced the understanding of complex psychological phenomena (Davison & Sireci, 2000; Einarsdóttir et al., 2010). Moreover, MDS can construct profiles or patterns of psychological tendencies using latent variables, effectively representing population-level profiles while also illustrating individual differences within these profiles.

FINDINGS AND DISCUSSION

The MDS results show RSQ = 0.999, where RSQ in multidimensional scaling indicates the proportion of the input data variance that can be explained by the MDS model. The higher the RSQ, the better the MDS model. According to Oraman et al., (2011), a multidimensional scaling model can be accepted if RSQ ≥ 0.6. This indicates that the developed vocational interest model is good. The result of the hexagonal model of the vocational interest scale developed in this study has a goodness of fit that is classified as special because it shows several <0.025 (Figure 1). Therefore, empirically, the hypothesized model is proven to have a profile form that is consistent with theory.

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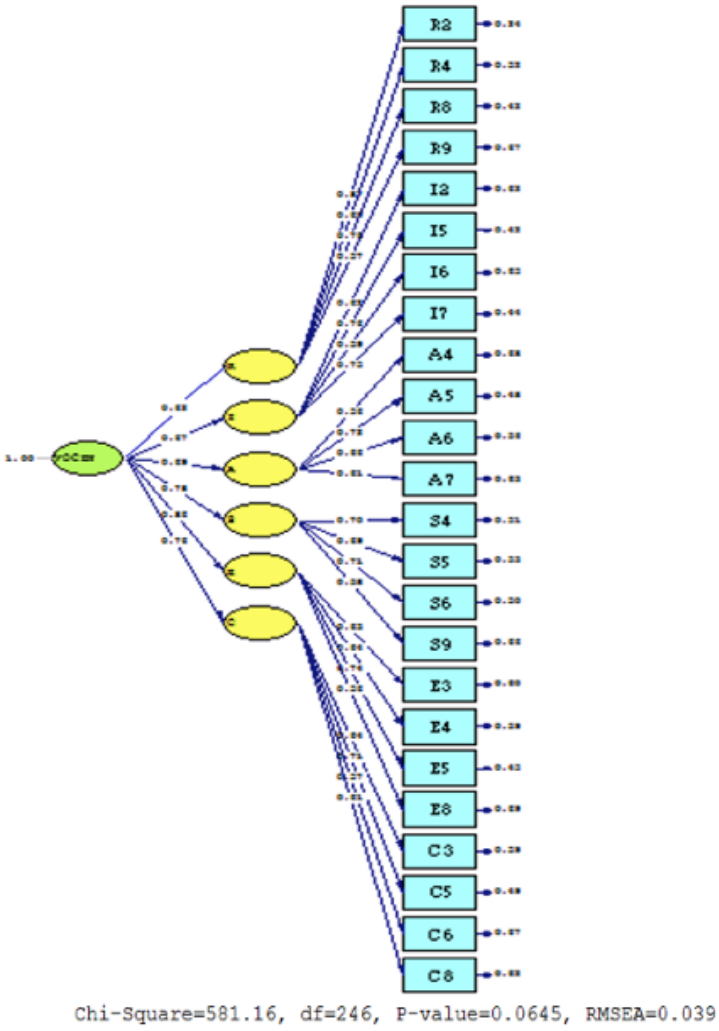

Figure 1. Path Diagram Standardized Solution Model for Vocational Interest Measurement with 24 Items

The path diagram illustrates a detailed model for evaluating vocational interests through 24 items categorized into six distinct factors. This framework facilitates a deeper comprehension of an individual's career preferences and tendencies. The model's configuration, comprising four items per factor, indicates a well-rounded method for assessing each vocational domain, potentially serving as a dependable and valid measurement instrument. The connections between items and their respective factors, as denoted by the arrows and accompanying numerical values, provide insights into the significance of each item's contribution to its associated factor.

The measurement model depicted in Figure 2 is a second-order factor structure. The primary latent constructs are represented by six sub-factors - Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Four observable indicators measure each. All indicator loadings (λ) fall between 0.72 and 0.88, exceeding the common convergent validity threshold of $\lambda \geq 0.70$ (Hair et al., 2014; Jiang et al., 2023). For example, the Artistic sub-factor indicators (A4–A7) load from 0.80 to 0.88, confirming that these items reliably reflect their latent dimension. Similarly, the Realistic sub-factor indicators (R2–R9) exhibit loadings between 0.75 and 0.87, indicating strong convergent validity across all sub-factors. These uniformly high loadings suggest that each observed item converges on its intended dimension, providing a robust foundation for the higher-order construct.

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The chi-square statistic ($\chi^2 = 581.16$, df = 246) yields a χ^2/df ratio of approximately 2.36, which is below the common cutoff of 3.0 for acceptable fit (Schermelleh-Engel et al., 2003). Although the χ^2 is relatively large, the p-value (0.0645) is greater than 0.05, indicating no significant discrepancy between the model-implied and observed covariance matrices. Most notably, the RMSEA value of 0.039 lies well below the 0.05 threshold for "close fit" (Schermelleh-Engel et al., 2003). This RMSEA result affirms that model misspecification is minimal and that the second-order factor structure aligns closely with the empirical data.

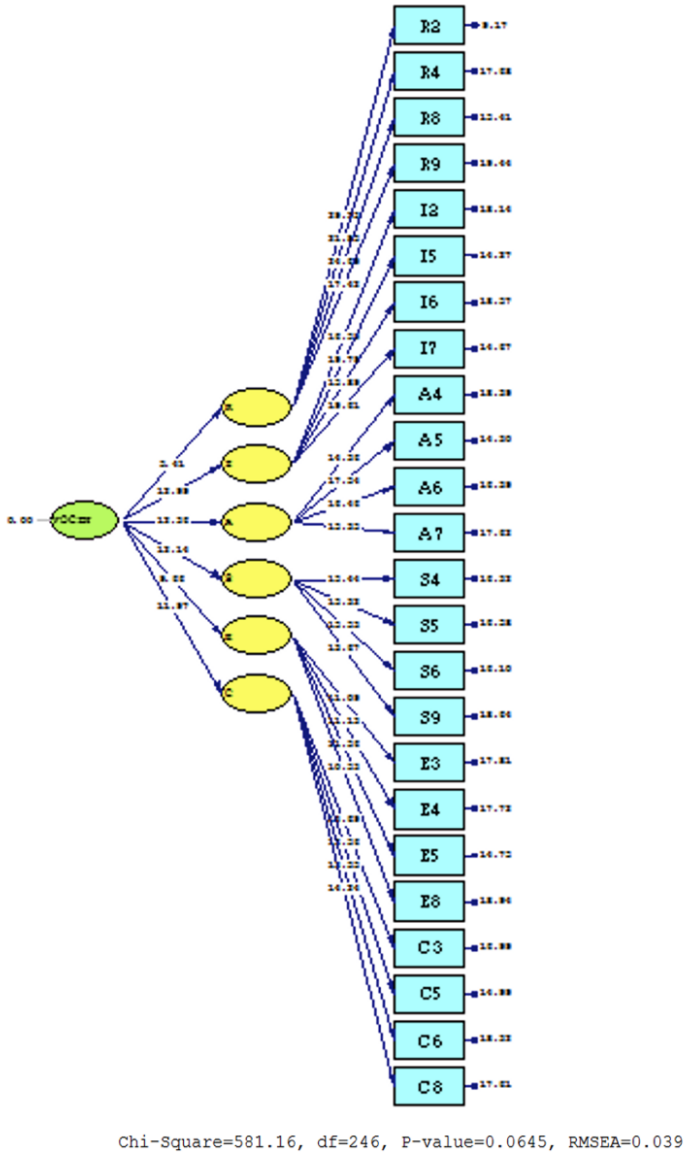

Figure 2. Path Diagram t-value Model for Vocational Interest Measurement with 24 Items

Figure 3 illustrates the sequence of aspects compared based on each attribute, as well as the form of the tendency of the relationship between aspects and their proximity patterns, as determined by the results of MDS using the SPSS 21 program. The profile of vocational interest aspects depicted in the diagram above shows that its shape remains hexagonal; however, the arrangement of aspects that form the vocational interest scale is based on Holland's hexagonal model of RIASEC. The results of this MBS analysis further strengthen the validity and reliability tests of the developed vocational interest scale and show good conformity with the hypothesized model. Thus, it can be concluded that the vocational interest instrument can be

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applied according to its purpose. The results of the model test, which are stated as fit as previously described, help researchers map patterns or typologies of vocational interest based on the aspects of vocational interest that are strongest in various skill packages or majors. An analysis of this vocational interest is useful for creating measurable criteria and standards in various fields of vocational interest, both in vocational and high schools. The data used were the responses of vocational school and high school students to the final vocational interest instrument, consisting of 24 statements. High school and vocational school students with the top ten class rankings were selected as key points for determining their choice of field of interest.

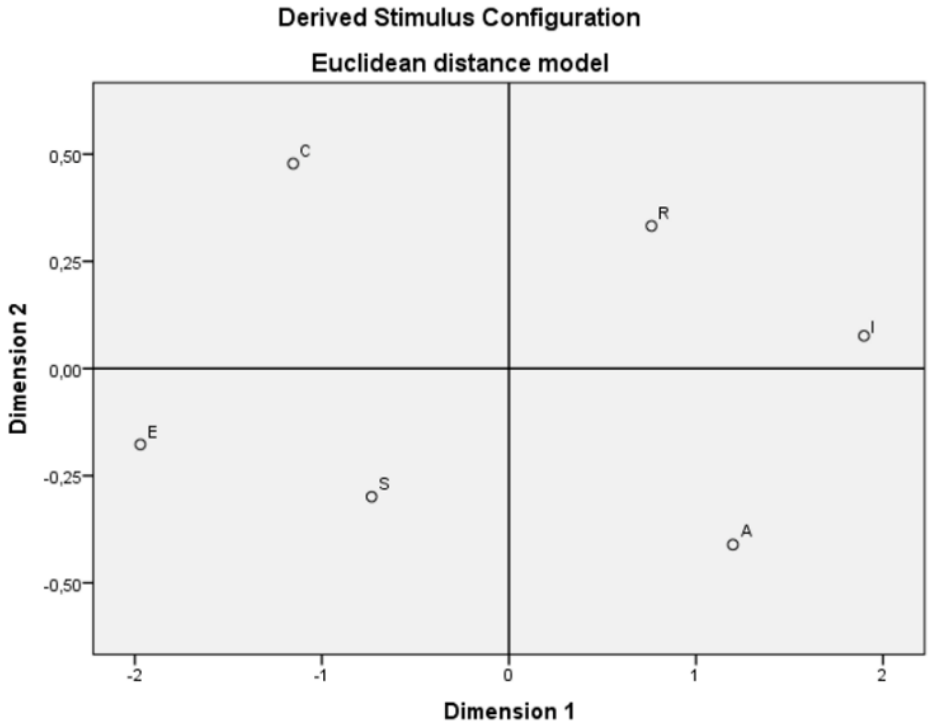

Figure 3. Hexagonal RIASEC Based on Research Data

This data is essential for identifying which items are the most representative or impactful within each vocational interest category. The varying degrees of these relationships may also reveal areas where the measurement tool excels or where it could be improved. The existence of correlations between factors, depicted by double-headed arrows, is particularly significant. These correlations imply that vocational interests are not standalone constructs but rather interrelated domains. This interrelation reflects the intricate nature of career preferences, where interests in one area may correlate with or influence interests in another.

Grasping these relationships can yield valuable insights for career counseling and personal development strategies. The standardized solution illustrated in the diagram provides a quantitative framework for interpreting vocational interests. This standardization enables consistent measurement and comparison across diverse individuals or groups, thereby enhancing the model's applicability in various contexts such as career guidance, educational planning, or organizational human resource management. Although the model seems thorough, it is crucial to acknowledge its limitations and potential areas for further exploration. For example, the choice of these specific six factors and 24 items may not encompass all dimensions of vocational interests.

The vocational interest instrument based on the RIASEC model developed in this research demonstrates good validity and reliability. Putri et al. (2024) reported that the RIASEC career inventory in Indonesia has a high content validity score (114 out of 119 items accepted)

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and good construct validity, along with an overall reliability rating in the high category. These findings are consistent with Anggraini et al. (2020), who obtained a Cronbach's α value of approximately 0.90 for the Holland career instrument in Indonesia. Factor analysis results also support the six-factor structure of RIASEC. Tasrif (2022) found that the RIASEC model fits the data ($p>0.05$; RMSEA=0.02) despite some moderate alpha coefficients. Overall, this empirical evidence suggests that the instrument effectively measures students' career tendencies in accordance with the Holland model, with metric quality aligning with previous research.

The Holland Model (RIASEC) serves as a thorough theoretical framework in career guidance, as it connects individual personalities with the requirements of the work environment. Research indicates that utilizing Holland's theory in career guidance services aids students in comprehending their interests and aspirations, thereby facilitating their selection of a course of study (Lubis et al., 2024). Furthermore, Lubis et al. (2024) stated that the RIASEC approach is effective in assessing students' career needs (need assessment). The six RIASEC typologies outline personal life goals and values that can impact students' future decisions. Interests mirror the types of activities and environments preferred by students (Makhrisa & Pradikto, 2025). By discerning these preferences, learners can choose an academic pathway that corresponds with their individual inclinations. However, the implementation of the RIASEC model necessitates an examination of the cultural milieu. These findings underscore the importance of tailoring the developed instruments to reflect the cultural distinctiveness of Indonesia. RIASEC can be a basis for career interest assessment. Its utilization within educational institutions needs to be adjusted to ensure pertinence to the local attributes of the student population. The applying model within the school must be modified to ensure relevance to the local characteristics of students.

In the context of education and career decision-making, the RIASEC instrument can serve as a valuable guide. The use of this instrument is also recommended for students in primary and secondary education (Hidayah et al., 2022) to map students' interests and talents. Career exploration has a significant impact on students and should be considered by responsible adults to support the development of their career exploration phase. Schools working with parents need to design programs that can explore students' talents and interests. This is important because the program is designed to help individuals grow their careers. Each party has a distinct role in helping a student grow and explore their career.

This shows that the need for school involvement (in this case, guidance and counselor teachers) in exploring students' interests is increasingly important. Guidance and counselor teachers can use the results of interest and career mapping to develop career counseling service programs with the right target. On the other hand, the validity of the mapping results convinces students to make decisions related to their future careers. In addition, this instrument can also serve as a reference for schools and policymakers in designing curricula based on students' interests, thereby aligning vocational education more closely with students' career aspirations.

CONCLUSION

The development of a vocational interest instrument based on Holland's RIASEC model for junior high school students has yielded promising results. The instrument demonstrates good psychometric properties, including construct validity and reliability, as confirmed through confirmatory factor analysis and multidimensional scaling. The hexagonal structure of the RIASEC model was empirically validated, supporting its applicability in the Indonesian context. This vocational interest scale can be a valuable tool for career exploration and guidance, particularly for junior high school students transitioning to senior high school or vocational education. By providing insights into students' vocational interests across the six RIASEC domains (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional), the

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instrument can assist educators, counselors, and students in making informed decisions about future educational and career paths. The research findings suggest that the instrument can effectively map patterns or typologies of vocational interest across various skill packages or majors in both vocational and high schools. This mapping can contribute to the creation of measurable criteria and standards in various fields of vocational interest, potentially improving the alignment between students' interests and their chosen educational tracks. However, it is essential to note that while the RIASEC model provides a comprehensive framework for understanding vocational interests, its implementation should consider the cultural nuances and local characteristics of the student population. Future research could focus on further adapting the instrument to reflect the cultural uniqueness of Indonesia and exploring its long-term predictive validity in terms of academic and career outcomes.

Conflict of Interests

Participants were informed that they had the right to withdraw from the research at any time they wished during the research. To maintain confidentiality, the names of all participants were not written in the study.

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