PROCEEDINGS
of The International Conference
on Psychology and Education

Gender and Educational-Level Differences in Vocational Interest Differentiation Among Indonesian Students

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Abstract. This study aim to test whether there is any significant differences in term of differentiation level of interest in term of gender and educational levels among Indonesian students. A total of 2,869 participants were involved in this study, including junior high school, senior high school, polytechnic, and university students. The level of differentiation interest was calculated using highest-minus-lowest index formula. While the tools to measured vocational interest was Kompas Minat Indonesia (KMI). The data analysis was conducted within factorial ANOVAs. The results showed that educational level (η^2p = .022 to .023) and gender (η^2p = .026 to .037) had significant effects on differentiation level of interest. This study also found there a small, yet significant, interactions effect was appeared (η^2p = .004 to .005). Female students and students in senior high school showed most differentiated profile compared to the other groups. The findings indicate that differentiation of vocational interest profiles in Indonesian students population varies systematically by gender and educational level.
Keywords: Vocational Interest Differentiation, RIASEC, Gender, Educational Level, Indonesian Students

1 Introduction

Vocational interests are relatively stable dispositions of personality that drive individual to pursue their career in particular activities, major, and occupations (Armstrong et al., 2008; Rounds & Su, 2014). Vocational interest was used in many educational setting to help individual know themself better, as it is also helpful in regard of giving career recommendation (Bagaskara et al., 2024). Vocational interest was a significant predictor for academic performance, persistence, and career outcomes (Nye et al., 2012). Previous study show that vocational interest tend to be stable after adolescent (Low et al., 2005), which later will be contribute to major life outcomes (Usslepp et al., 2020). Vocational interest assessment therefore occupies a central position in educational and career guidance, including in Indonesian educational system.

One of the most robust vocational interests theory was Holland's Structure of Interest (Holland, 1997). This theory postulate that there are a total six types of vocational interest, such as Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC). The dynamics of those dimension shape the profile of interest. Psychologist usually interpret the results of vocational interest assessment based on the top-three letters of it (Xu & Li, 2020). Therefore, the more different level of each dimension, the highest differentiation profile, while the more close each dimension level, the flatter the profile

become. In this context, differentiation refers to the degree to which interest scores vary across the six domains (Holland, 1997; Iachan, 1984). The differentiation can be examined separately for liking, self-efficacy, and even composite score of vocational interest (Lent et al., 1994). Thus, vocational interest differentiation could be understood as a within-person variability across RIASEC domains.

A relatively undifferentiated profile complicates interpretation. When the six scores lie close together, the three-letter Holland code becomes unstable, small measurement error can reorder the code, and recommendations derived from the highest domains lose specificity. Flat profiles have accordingly been discussed as potential markers of diffuse vocational identity and career indecision, although the empirical record for such claims is mixed rather than uniform (Hirschi, 2009). Low differentiation should therefore be read as an interpretive signal rather than as evidence of maladjustment.

Conversely, more clearly differentiated preferences have been associated with career decidedness in adolescence. For instances, in Swiss samples increases in differentiation predicted increases in decidedness beyond personality traits (Hirschi, 2009). The criterion validity of traditional differentiation indices is nonetheless modest unless they are operationalized precisely (Tracey et al., 2014), and profile shape features in meta-analytic accounts of interest development from adolescence to adulthood (Hoff et al., 2018). A differentiated profile is not automatically better, because a sharply peaked profile can still be incongruent with a chosen program. Vocational interest differentiation profile is one descriptive property among several, alongside related constructs such as career adaptability (Zacher et al., 2015).

These considerations matter for Indonesian practice, where interest assessment informs subject-stream selection in senior high school, program choice between vocational diploma and undergraduate tracks, and school counseling services. Kompas Minat Indonesia (KMI) was developed to measure RIASEC liking and self-efficacy in this context. Indonesian research has begun to map vocational interest measurement through bibliometric and scoping reviews (Bagaskara et al., 2024; Bagaskara & Assa, 2025), to validate RIASEC instruments for junior high school students (Artosandi et al., 2025), and to examine Holland's hexagonal structure among senior high school students (Widyana et al., 2025), yet this literature concerns instruments, structure, and congruence rather than profile differentiation. Local evidence on differentiation across these student groups therefore remains necessary.

Direct evidence on group differences in differentiation remains thin. Noronha & Ambiel (2015), analyzing 6,824 Brazilians aged 14 to 50 with a seven-dimension interest measure and one-way analyses of variance, found that differentiation was lowest among 14-year-olds, peaked near age 20, and differed by schooling, with college students highest, concluding that schooling was more informative than age. Meanwhile, Su et al. (2009) documented large gender differences in the level of specific interests in a meta-analysis of 503,188 respondents, yet mean-level differences do not directly test within-person differentiation. Therefore, the joint association of gender and educational level with differentiation, including their interaction, has rarely been modeled in a single factorial design, and published Indonesian evidence on this question appears to be lacking.

Indonesian evidence is needed because interest tests are interpreted from early adolescence through emerging adulthood, and because unbalanced gender compositions across educational tracks can distort impressions formed from single-factor comparisons. The present study therefore examined the differentiation of vocational interest scores, including the liking, self-efficacy, and composite aspects of RIASEC profiles in a large multi-level Indonesian sample. The findings of this study are intended to inform researchers, psychometricians, educational psychologists, and career counselors.

2 Methods

2.1 Participants

This study analyzed a total of 2,869 participants (M_{age} = 18.09 years; SD_{age} = 1.95; 52.1% female) ranging from 13 to 29 years old. All participants were Indonesian students assessed through institutional administrations of KMI at four educational levels, covering junior high school (SMP; n = 143), senior high school (SMA; n = 514), three-year polytechnic diploma programs (D3; n = 434), and undergraduate university programs (S1; n = 1,778). All participants provided informed consent.

2.2 Instruments

Kompas Minat Indonesia (KMI) is an Indonesian RIASEC inventory of 84 items, seven liking and seven self-efficacy items per domain, each rated on a seven-point scale. Composite item scores sum the corresponding liking and self-efficacy responses, and domain scores were computed as item means. In the present sample, internal consistency was high for the composite domain scales (α = .86 to .94; ω = .86 to .94) and adequate for the liking (α = .85 to .93) and self-efficacy (α = .83 to .92) scales. A six-factor confirmatory factor analysis was conducted, showing that the instrument is valid based on both standardized loadings (.63 to .88) and goodness of fit indices ($\chi^2(804)$ = 15,959.91; RMSEA = .081; SRMR = .060; Hu & Bentler, 1999; Li, 2016). Differentiation was computed with the highest-minus-lowest index (Holland, 1997), separately for liking, self-efficacy, and composite domain scores, while composite differentiation was derived from the combined domain scores.

2.3 Procedure

KMI was administered in supervised institutional testing sessions through a computerized assessment platform during 2026. Data were de-identified before analysis. This study design was approved by the ethics committee of Konsorsium Psikologi Ilmiah Nusantara through Ethical Clearance number 380/2025 Etik/KPIN.

2.4 Data Analysis

Analyses used R version 4.5.1 (R Core Team, 2025). Each differentiation outcome was modeled with a 4 × 2 factorial ANOVA (educational level × gender) using sum-to-zero contrasts and Type III sums of squares, which test each effect adjusting for all others and suit this strongly unbalanced design. Because Brown–Forsythe tests indicated heteroscedastic cell variances, inference used HC3 heteroscedasticity-consistent covariance matrices (Long & Ervin, 2000). Effect sizes were partial eta-squared (η^2p). Estimated marginal means (EMMs) with 95% confidence intervals and simple effects of gender within each level were computed, and p values were adjusted with the (Holm, 1979) procedure. Sensitivity analyses repeated the models with the alternative indices and with covariance adjustment for profile elevation and its square.

3 Results

The study included 2,869 Indonesian students (M_{age} = 18.09, SD_{age} = 1.95; 52.1% female in the analytical sample). Participants represented four educational levels, ranging from junior high school to university. Detailed demographic characteristics are presented in Table 1.

Table 1. Participant demographic characteristics (N = 2,869).

Characteristic	*n*	*%*
Junior high school (SMP)	143	5.0
Senior high school (SMA)	514	17.9
Polytechnic (D3)	434	15.1
University (S1)	1,778	62.0
Male	1,375	47.9
Female	1,494	52.1
Age in years, M (SD)	18.09 (1.95)	–

Note. Age range 13 to 29 years.

Descriptive analyses showed that female students consistently exhibited higher vocational interest differentiation than male students across all educational levels and measurement components. Senior high school students demonstrated the highest differentiation within both gender groups, whereas the lowest composite differentiation was observed among junior high school males. The gender difference appeared most pronounced in junior high school and smallest in polytechnic education. The complete descriptive statistics are presented in Table 2.

Table 2. Descriptive statistics of HL differentiation by educational level and gender.

Level	Gender	*n*	Liking M (SD)	Self-efficacy M (SD)	Composite M (SD)
SMP	Male	63	1.29 (1.04)	1.27 (1.05)	2.44 (1.94)
SMP	Female	80	2.24 (1.29)	2.15 (1.25)	4.32 (2.50)
SMA	Male	241	2.05 (1.04)	2.05 (1.02)	3.93 (1.95)
SMA	Female	273	2.64 (1.17)	2.48 (1.08)	5.01 (2.21)
D3	Male	337	1.58 (0.89)	1.67 (0.90)	3.14 (1.73)
D3	Female	97	1.95 (0.94)	1.90 (0.91)	3.74 (1.76)
S1	Male	734	1.58 (1.12)	1.58 (1.09)	3.04 (2.14)
S1	Female	1,044	2.36 (1.21)	2.17 (1.11)	4.46 (2.29)

Note. HL = highest-minus-lowest index on the item-mean metric (liking and self-efficacy 1–7; composite 2–14).

The assumption checks showed acceptable skewness and kurtosis, although the normality tests were significant and variances differed across groups. Therefore, HC3 robust standard errors were used in the factorial ANOVA. The results showed significant main effects of educational level and gender on vocational interest differentiation across liking, self-efficacy, and composite scores. Gender showed larger effects than educational level, although both effects were relatively small. Furthermore, significant interactions between educational level and gender were found across all three scores, with small effect sizes (η^2p = .004–.005). The complete results are presented in Table 3.

Table 3. Main and interaction effects of educational level and gender on HL differentiation

Outcome	Effect	*df*	*F*	*p*	η^2p
Liking	Educational level	3, 2861	25.00	< .001	.023
Liking	Gender	1, 2861	115.25	< .001	.037
Liking	Level × Gender	3, 2861	4.99	.009	.004
Self-efficacy	Educational level	3, 2861	23.35	< .001	.023
Self-efficacy	Gender	1, 2861	75.33	< .001	.026
Self-efficacy	Level × Gender	3, 2861	4.77	.010	.004
Composite	Educational level	3, 2861	23.88	< .001	.022
Composite	Gender	1, 2861	109.77	< .001	.035
Composite	Level × Gender	3, 2861	5.51	.005	.005

Note. F statistics use HC3 heteroscedasticity-consistent covariance matrices; p values are Holm-adjusted across the nine factorial tests.

As shown in Figure 1, senior high school females had the highest differentiation, while junior high school males had the lowest. Holm-adjusted comparisons showed that senior high school students had significantly higher composite differentiation than students at other educational levels. University students also had higher differentiation than polytechnic students, while junior high school students did not differ significantly from either group. Meanwhile, female students showed significantly higher differentiation than male students at every educational level, with the largest gender difference found in junior high school and the smallest in polytechnic education.

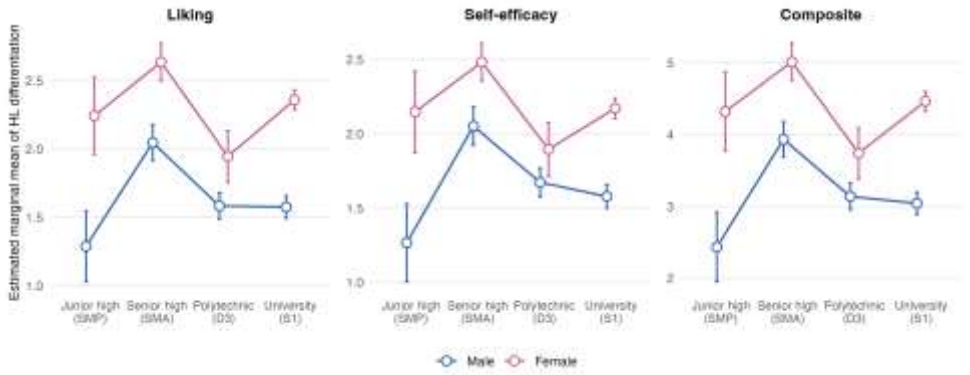


Fig. 1. Estimated marginal means of HL differentiation by educational level and gender.

4 Discussion

This study aimed to examine whether vocational interest differentiation differs across gender and educational levels among Indonesian students. Educational level was associated with differentiation across all three score types. The differentiation of RIASEC profiles here was not linear. Senior high school students showed the most differentiated profiles, while polytechnic students showed the least differentiated profiles, and junior high school and university students fell in between. A previous study by Noronha & Ambiel (2015) showed a different finding in a Brazilian sample, as college students had the highest differentiation compared to other contexts. Holland (1997) suggested that students approaching educational and career choices may develop clearer differences among their preferences, while students already enrolled in a program may have fewer opportunities or reasons to reconsider their interests. While Hirschi (2009) add that the changes were associated with career exploration and increases in career decidedness. Therefore, students in senior high school showed the highest differentiation compared to those already enrolled in diploma or bachelor courses.

This study also found that gender showed larger effects than educational level. Female students had more differentiated profiles compared to male students across all educational levels and vocational interest aspects (Sung et al., 2017). This finding extends previous research that has mainly focused on gender differences in specific vocational interests (Du et al., 2025; Tao et al., 2022; Wicht et al., 2022). However, differentiation differs conceptually from mean-level interest differences because it reflects variation within an individual's interest profile rather than preference for particular domains (Tracey et al., 2014). Gender-related socialization may contribute to differences in how individuals

develop and express their vocational interests (Hoff et al., 2024), although the present study cannot determine the underlying mechanisms.

In line with the findings above, the interaction between gender and educational level was statistically significant across all three vocational aspects, although the effects were small (η^2p = .004–.005). Female students consistently showed higher differentiation than male students, but the gender difference was smallest among polytechnic students. It should also be noted that there was a gender imbalance in the polytechnic sample, which consisted of 77.6% male students from engineering-oriented programs. This highlights that educational selection by males and females may partly explain this pattern in career selection (Du et al., 2025; Sung et al., 2017).

This study did not find support for the expectation that vocational interest differentiation increases consistently with educational level (Pässler & Hell, 2020). Junior high school students did not differ significantly from polytechnic or university students on the composite index, while university students showed only a modest difference compared with polytechnic students. Hoff et al. (2018) found that vocational interest levels change across adolescence and early adulthood, although patterns differ across interest domains. Meanwhile, the present findings suggest that educational context and selection into specific programs may also be relevant to understanding differences in vocational interest differentiation.

These findings have implications for the interpretation of Holland-based vocational interest assessments. Differences in vocational interest differentiation across gender and educational levels suggest that RIASEC profiles should be interpreted with attention to the characteristics of the assessed population (AERA et al., 2014) For instance, relatively flat profiles were more common among polytechnic and male students, indicating that similar differentiation scores may have different relative positions across groups. Meanwhile, vocational interest assessments commonly emphasize identifying the three highest-scoring RIASEC dimensions to determine an individual's interest profile. Therefore, assessment reports should also consider lower differentiation among certain groups, as this may affect how their profiles are interpreted and presented. Furthermore, these findings suggest the potential value of adding a ranking task at the end of Likert-type self-report assessments, allowing participants to prioritize their vocational interests more explicitly.

5 Conclusion

This study found that vocational interest differentiation differed across both gender and educational level among Indonesian students, and that the two factors interacted. Female students showed more differentiated RIASEC profiles than male students, senior high school students showed the most differentiated and polytechnic students the flattest profiles, and the gender difference was narrowest in the polytechnic group, although the interactions were small. For vocational interest assessment in Indonesia, these results imply that the flatness of a KMI profile is most informative when read against the student's gender and educational context rather than against a single undifferentiated norm.

Acknowledgements: The authors would like to thank all partner institutions that supported this study.

Funding: This study received no financial support.

Data Availability: De-identified data and analysis scripts are available from the corresponding author on reasonable request.

Authors' Contributions Statement: Rafli Sodiq Bagaskara: Conceptualization, Methodology, Formal analysis, Writing - original draft. Diana Dyassa Putri: Investigation, Data curation, Writing - review & editing. Anjar Kartaputra: Conceptualization, Supervision, Writing - review & editing.

Competing Interest: The authors are affiliated with Anvesana Research Institute, the organization that developed Kompas Minat Indonesia.

Ethics Approval and Informed Consent: This study design was approved by the ethics committee of Konsorsium Psikologi Ilmiah Nusantara through Ethical Clearance number 380/2025 Etik/KPIN.

AI Use Disclosure: OpenAI was used for grammatical refinement purposes.

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