

Career Preference-Personality Mismatch: Leveraging the RIASEC Model in IT-Driven Career Guidance

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Abstract

Whereas choosing a career is a critical life decision, career decision-making process among secondary school students involves misalignment between students' aspirations and their aptitudes. This study examines the mismatch between career preferences and personality profiles of 717 Ugandan Advanced level and university students from 15 secondary schools and 1 university in Central and Western Uganda. Holland's RIASEC model was used to determine career preferences and determined personality through a 42-item inventory. Statistical analysis in SPSS indicated a substantial misalignment: while nearly 50% of students preferred Investigative or Realistic careers such as engineering and medicine, only 28% demonstrated personality congruence with their preferences. Conversely, students with Social-dominant personalities, rarely selected careers matching this orientation. The overall findings demonstrate a weak positive relationship (Kendall's $\tau = 0.394$) between students' career preferences and personalities. These results challenge conventional personality-driven career guidance systems, demonstrating their limited applicability in Uganda. Our key contribution lies in transforming mismatches into actionable insights, proposing a hybrid framework that dynamically weights RIASEC profiles against local opportunity data and student aspirations, offering a scalable solution for low-resource educational contexts.

Keywords: Career Decision-Making, Decision Support Systems, Personality, Career Mismatch, RIASEC Model

1. INTRODUCTION

This study begins by examining the theoretical foundations and contextual challenges of career selection and guidance in secondary education. It then outlines the study's methodology, including research design, sampling, and statistical analysis, followed by presentation and discussion of key findings. The final sections put the findings in the context of previous research, propose practical implications

for career guidance systems, note limitations, and suggest directions for future research.

Career selection represents one of the most challenging decisions facing secondary school students, compounded by multiple complex factors [1], [2]. This complexity arises from numerous factors, including a wide range of often unfamiliar subject choices, limited student self-awareness, peer pressure, parental influence and a rapidly changing job market that requires constantly adapting skillsets ([3], [4], [5]). Career mismatch has for long been a common phenomenon among secondary school students. It occurs when students' career preferences diverge from their personality traits.

In Uganda's education system, this issue is particularly pronounced when students undergo multiple career selection points: first upon entering secondary school in Form 1, then in Form 2 when reducing subjects from 18 to 10, and again in Form 4 when selecting their final three Advanced Level (A-level) subjects. Uganda's current system assigns A-Level subject combinations based solely on Ordinary Level examination performance, without considering students' personality types or long-held career aspirations. This narrow approach has resulted in widespread mismatches between students' academic paths and their true potentials [5], [6].

Career mismatch has been extensively researched in developed countries, such as Sweden, Switzerland, Germany, Spain, and France [1], [2], [7], [8]. However, career mismatch remains under-researched in developing countries, particularly African nations like Cameroon, Ghana, and Kenya [9]. While these countries face challenges common across the continent, they also have significant potential due to their young populations.

Current career decision support systems primarily rely on personality assessment through theoretical models like RIASEC, which is derived from Holland's theory [10], [11], [12], [13]. Holland's theory has become one of the most referred to theories of career guidance that helps to match personalities with their respective vocations, [11], [13], [14]. Its widespread adoption in career guidance stems from its role in identifying personalities and matching them to careers, which is a concern in Uganda's education system.

The theory classifies personalities into six types: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C), often referred to as a RIASEC model, [15], [16], [17]. RIASEC personality types are arranged in a hexagonal order (Figure 1) in relation to their similarity, with the closest being similar and vice versa [15]. The RIASEC model's six personality types each include distinct descriptions, characteristics, and corresponding career options that align

with an individual's personality profile, [18], [19]. Table 1 details the RIASEC personality types.

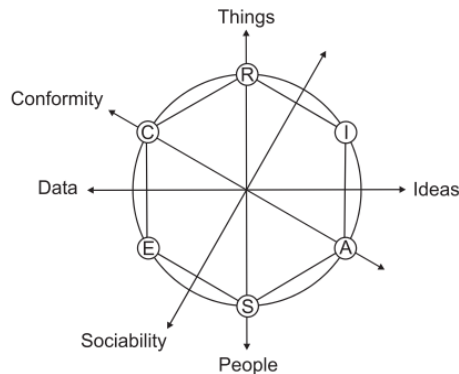


Figure 1. RIASEC Model hexagon [15]

Table 1: Personality Types in RIASEC model [15].

Personality Type	Personality Type Characteristics	Career Options
R-ealistic (<i>The Doers</i>)	Values: practical, productive, and concrete values. Competencies: Deal with machines, tools, materials, plants, construction, and games (indoor and outdoor).	Engineers, athletes, farmers, Chefs, Drivers, Military
I-nvestigative (<i>The Thinkers</i>)	Values: ideas, observation, analytical or intellectual Competencies: Documentation of new knowledge and problem-solving	Scientists, Computer Scientist and IT Specialist, Mathematicians, Lawyers
A-rtistic (<i>The Creators</i>)	Values: Innovative, creative, self-expression Competencies: Language, art and design, music, dance, and drama	Creative and Performing Artists
S-ocial (<i>The Helpers</i>)	Values: Patience, communication, guide, working with people Competencies: teaching, caring, counseling	Teachers, nurses, doctors, caregivers, counselors
E-nterprising (<i>The Persuaders</i>)	Values: Persuasion, decision-making, risk-taking. Competencies: Leadership and entrepreneurship	Entrepreneurs, Leaders, Business people, Lawyers
C-onventional (<i>The Organisers</i>)	Values: Data manipulation, procedure, routines, critical to standards and details, systematic. Competencies: Clerical, accounting, auditing, and business.	Auditors, Accountants

Adopted from [15].

According to RIASEC model, an individual's career preference is aligned with dominant personality traits [19], [20]. Empirical evidence supports this alignment, with Realistic personalities disproportionately selecting engineering careers and Artistic personalities favouring design fields, [15], [21]. This is further supported by [17], who found a moderate to strong correlation (from $r = 0.45$ to $r = 0.62$) between students' RIASEC personalities and their expressed career preferences.

Studies in sub-Saharan Africa suggest significant mismatches between students' RIASEC personality types and their career preferences are due to inadequate career counseling infrastructure and other interfering factors [5], [10]. Systems that do not include career preference involve significant limitations. Research across eight studies reveals that computer-assisted career guidance systems lacking preference inputs fail to address critical aspects of decision-making: they show inconsistent effects across career development domains, neglect external conflicts, and prioritize user satisfaction over tangible career gains [22], [23], [24]. While some systems improve attitudinal outcomes such as career indecision, their inability to integrate aspirations with aptitudes underscores the need for more holistic, preference-aware designs.

Ideally, a user-centric career guidance system should highlight the discrepancy between a student's expressed career preferences and their RIASEC-based personality matches [25], [26]. With this comparison, the system enables users to recognize potential mismatches and consider the recommended alternatives. This process of career adjustment is possible when careers preferred are considered alongside RIASEC model's identified personality types to enable the system users cope with career adjustment and change smoothly, [27], [28]. Therefore, the purpose of this study is to explore the mismatch between secondary students' expressed career preferences and their RIASEC-based personality profiles, and to consequently inform the design of information systems (IS) for career guidance. Based on previous findings, we hypothesize the following:

H: There is a significant strong positive association between students' RIASEC personality types and their career preferences.

2. METHODS

2.1. Research Design

The study employed a cross-sectional survey design on A-Level and university students in Central and Western regions of Uganda. The Central and Western regions were purposively selected due to their substantial student populations, collectively representing 55% of Uganda's secondary school student enrollment [29]. Specifically, the Central region which is more urbanized constitutes 30% of

national enrollment while Western region has 25% enrollment. This strategic selection ensures a representative sample encompassing diverse educational contexts across urban and rural settings[29]. With a large study student population in the 2 regions, (N>100,000), the target sample size (n) was determined using Cochran's formula [30].

$$n = \frac{Z^2 pq}{e^2} \quad (1)$$

It was assumed that the proportion of the population with the attribute of interest (p) is 0.50. A desired confidence interval of 95% (Z=1.96) and a margin of error (e) of 0.035 were applied, with q defined as 1-p and the required sample size, n, is calculated to be 784 [29]. Incomplete questionnaires were excluded to improve data quality resulting in 717 complete responses constituting 91.5% response rate which is satisfactory [28]. Outliers were retained to preserve data variability and enhance the generalizability of the findings. A sample of 784 students was selected from Central and Western regions in the districts of Kampala, Mbarara, Kalangala, Kyegegwa, and Wakiso. The students included A-Level students of Form 5 and Form 6 from 15 secondary schools and as well as students from Makerere university. The A-level students were selected from both Arts and Science streams. University students were selected from the medicine, engineering, and business programs each aligning with distinct RIASEC personality types of Investigative, Realistic and Enterprising respectively. The flowchart of the research process is provided in Figure 2.

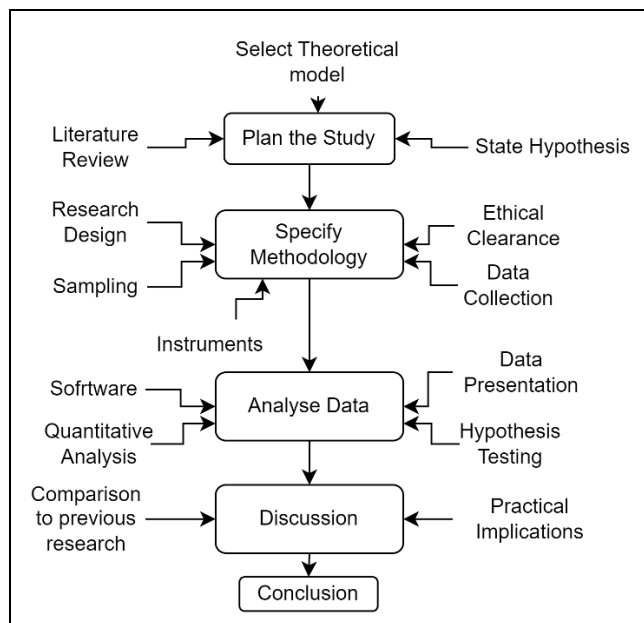


Figure 2. Research Flow

2.2. Data Collection, Analysis and Presentation

Data were collected using a structured questionnaire comprising three key components: demographic information, career preference assessment, and the 42-item RIASEC inventory to measure personality with 7 items per personality type. Students filled the RIASEC form, their choices were computed per personality and the top-most ranked was considered as the student's personality. Previous research using the RIASEC 42 items demonstrated satisfactory validity for adolescent and adult populations with α values in excess of 0.80 [29].

SPSS was used for data analysis and visualisation was done using both Excel and SPSS. Participants' dominant personality types were identified as their highest-scoring RIASEC profile. Career preferences were then compared with the personality profiles using Kendall's τ rank correlation coefficient, a non-parametric measure of association appropriate for ordinal data that makes no assumptions about linear relationships [31]. Furthermore, Kendall's τ was preferred to Spearman's ρ due to better handling of tied ranks common in career preference data. This analysis quantified the relationship between students' self-reported career preferences and their RIASEC-derived personality types, in line with established congruence methodology [32]. Descriptive data is presented in tables and charts.

3. RESULTS AND DISCUSSION

3.1. Descriptive Statistics for the Demographic Variables

The sample demographic characteristics of gender, level of education, age, institution category, and school location were considered. For each variable, frequency counts (N) and corresponding percentages are provided as shown in Table 2.

Table 2. Demographic characteristics

Characteristic	N	%
Gender		
Male	345	48.0
Female	372	52.0
Level of Education		
Form 5	332	46.3
Form 6	312	43.5
University	73	10.2
Age (years)		
Below 18	68	9.5
18 – 24	633	88.2
25 – 29	9	1.3
Above 29	7	1.0

Characteristic	N	%
Institution Category		
Government Owned (Public)	512	71.0
Private	205	29.0
Location of Institution		
Urban	322	44.9
Peri-urban	244	34.0
Rural	151	21.1

Table 2 show that males and females, as well as Form 5 and Form 6, are approximately equally represented in the sample. Furthermore, the majority of the respondents (633/88.2%) are aged of 18-24 years. Those below 18 years constitute 9.5% and those in the range of 25 years and above constitute 2.3%. Further, majority of respondents (512/71.4%) were in government-funded institutions constituting 512 (71%), while 205 (29%) are in privately owned institutions. Moreover, students from public schools are more represented compared to students from private schools. School locations in terms of urban, peri-urban and rural were considered in the proportions of 322 (44.9%), 244 (34.0%), and 151 (21.1%) respectively.

3.2. Mismatch between Students' Career Preference and Personality

The mismatch between Personality type (shown in blue) and preferred career (shown in maroon) is presented in a relationship map in Figure 2. Each line represents a link between a personality type and a preferred career, with the thickness of the line indicating the number of students sharing that relationship. The larger the node, the higher the number of students falling into that category.

From Figure 2, Realistic careers are the most preferred among students (as indicated by the largest maroon node), followed by Investigative, Enterprising and Conventional being the least. Conversely, Social personality trait is dominant among students (as indicated by the largest blue node), followed by Enterprising, Conventional with Artistic being the least student personality trait. However, the thick lines connecting personality types such as Investigative, Social, and Conventional to Realistic career preferences suggest a significant mismatch. Likewise, the social personality type is dominant (as indicated by the large blue node) but students with this personality are spread across various career preferences, including Investigative, Realistic and Artistic.

The estimate of the variations in personality traits and their corresponding career preferences was determined. Findings revealed that career preferences were dominated by Investigative (25.6%) and Realistic (24.1%) fields, followed by Enterprising (20.2%), Social (10.6%), Artistic (10.1%), and Conventional (9.5%) fields. In contrast, personality assessment results showed social trait as most

prevalent with 23.0%, followed by Enterprising (19.1%), Conventional (17.9%), Investigative (14.8%), Realistic (13.2%), and Artistic (12.1%).

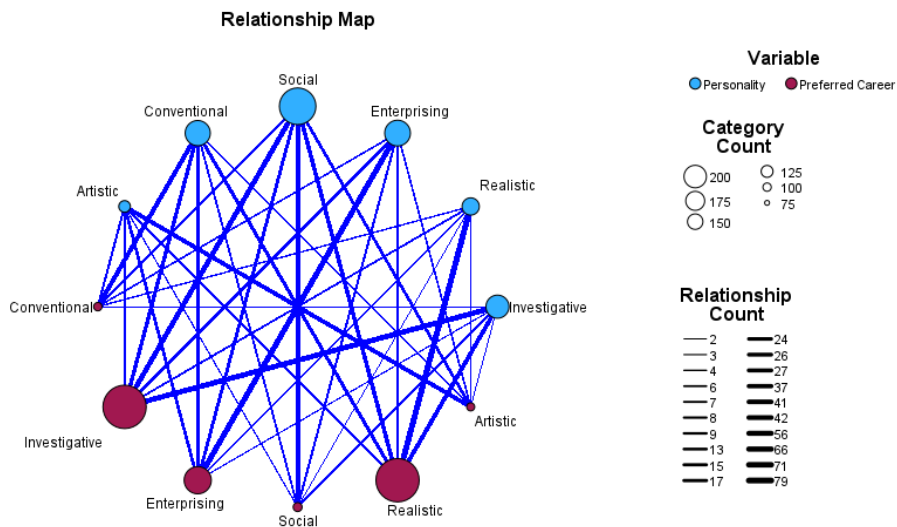


Figure 2. Relationship map between Career Personality and Preferences

Figure 3 summarizes these distributions, highlighting disparities between preferred careers and personality profiles.

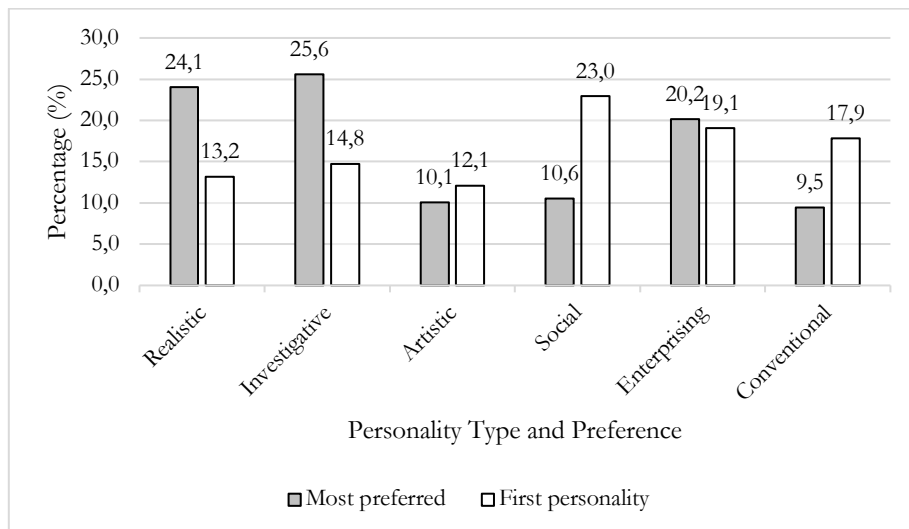


Figure 3. Quantified mismatch of Career Preferences and Personalities

Figure 3 demonstrates mismatch between career preferences and personality types, with only two categories showing relative alignment: Artistic (preference: 10.1% vs. personality: 12.1%) and Enterprising (20.2% vs. 19.1%). The most substantial mismatches occurred in Realistic (24.1% vs. 13.2%), Investigative (25.6% vs. 14.8%), Social (10.6% vs. 23.0%), and Conventional (9.5% vs. 17.9%) categories. Further findings indicate that 50% of the students disproportionately preferred science-related careers (primarily Realistic and Investigative types) with only 28% demonstrating personality congruence with their preferences. Conversely, Social and Conventional orientations were markedly underrepresented in career preferences,

3.3 Hypothesis Testing

The relationship between students' career preference and personality type was quantified using Kendall's τ rank correlation as shown in Table 3.

Table 3. Association Between Students' Career preference and Personality

Kendall's τ	0.394***
p-value (2-tailed)	0.000
N	717

The analysis yielded a statistically significant yet a low correlation between students' career preferences and RIASEC personality types ($\tau = 0.394$, $p < 0.001$). Following Cohen's (1988) benchmarks, this falls below the threshold for a strong correlation ($r > 0.60$), suggesting a weak positive association. These results indicate that students' personality types do not strongly influence their career preferences, while also revealing unexplained variance in vocational decision-making. Converting τ to an approximate R^2 [33], personality traits account for roughly 15% of the variance in career preferences within our sample (using τ -to- R^2 conversion methods; [33]), leaving room for other factors (85%). Therefore, the hypothesis is *rejected*.

3.3. Discussion

The findings revealed distinct mismatches between personality type and career preference in all the six RIASEC model traits further underscores the inconsistencies between what students are naturally inclined toward and the careers they choose or aspire to. This variation is possibly due to social influence, limited career guidance, or misconceptions about career prospects. The fact that a substantial proportion of students preferred careers that did not align with their personality types, is in line with previous similar studies which discovered a mismatch with distinct inter-individual differences, whereas the interests were

shown to be stable over time [34], [35]. These findings share similarities to previous research on African samples, such as Cameroon, Ghana, and Kenya [9].

The findings of our study rejected the hypothesis that “*there is a significant strong positive association between students’ RIASEC personality types and their career preferences*”.

The weak correlation between personality and career preference suggests that while personality is relevant in this context, a substantial proportion of career decision-making remains unexplained by RIASEC personality types. Such findings underscore the likely contribution of additional factors, such as environmental influences, socioeconomic background, or personal interests, which is supported by previous studies that underscore the complex interaction of multiple factors on career decision-making over time [36].

With a large portion of students preferring careers with only a few demonstrating personality congruence with their career preferences [37] suggests that basing of RIASEC model alone without career preference leaves approximately 50% of the students not appreciating the guidance given by a system [38]. In Uganda, this appears exacerbated by contextual factors such as cultural valuation of medical/engineering professions and parental pressure toward prestigious and financially secure professions [5]. The 50% mismatch rate implies that purely RIASEC-based systems risk poor user engagement, as they fail to address these socio-cultural realities. This underscores the need for guidance technologies that simultaneously honor personality profiles while explicitly addressing the external factors that shape preferences.

These findings have critical implications for developing more effective career guidance information systems. First, systems should integrate RIASEC personality assessments while acknowledging their limitations. Second, design frameworks should incorporate contextual factors, including cultural and socioeconomic variables, through adaptive interfaces that address these influences. Third, the observed mismatch patterns (e.g., Artistic/Social types preferring Investigative careers) suggest systems should: flag common discordances, provide explanatory narratives about their prevalence, and offer compromise pathways that bridge personality profiles with contextual realities. Particularly in African contexts, systems would benefit from hybrid algorithms that weight both psychological assessments and localized sociocultural data, moving beyond static Holland-based recommendations to dynamic models that reconcile internal dispositions with external pressures.

Explicit practical implications for educators and system designers can be illustrated using examples. For instance, systems could incorporate RIASEC assessments while explicitly acknowledging their 15% explanatory power for Ugandan students’ preferences, as quantified in our Kendall’s τ -to- R^2 conversion. Educators should

pair these assessments with guided discussions. For example, when a student's Investigative career preference (e.g., medicine) flags as mismatched with their social personality, the system could display: "This suggestion is based on personality alignment (28% match rate in Uganda), but your passion for medicine matters too. Let us explore community health or medical education roles that blend both." System designers must then embed three actionable features: geolocated opportunity dashboards showing regional demand for compromise careers (e.g., medical trainers needed in Central Uganda), parental influence modules that address common pressures (e.g., "60% of Ugandan parents prioritize medicine. How might this affect you?"), and hybrid pathway builders with sliders to adjust recommendation weights (e.g., 40% personality fit, 30% local job growth, 30% personal aspiration). For educators, this demands training to reframe mismatches as negotiation opportunities, such as role-playing exercises where students defend Artistic-Investigative compromises (e.g., biomedical illustration) using job market data. These interventions must be adjusted for Uganda's infrastructure, with offline mobile interfaces in local languages and case studies of Ugandan professionals who succeeded through non-linear paths (e.g., engineers who transitioned to education). Without such adaptations, systems risk irrelevance by ignoring the 72% of students whose aspirations diverge from personality-based recommendations, which this study empirically quantifies.

Nevertheless, our study has several important limitations that should inform interpretation of the results. First, while Kendall's τ identified associations between variables, this approach cannot determine causation or account for key confounding factors. Most significantly, we could not isolate whether personality traits directly influence career preferences, or whether external pressures (parental expectations, scholarship opportunities, socioeconomic factors) simultaneously shape both personality expression and vocational choices. More sophisticated modeling techniques, such as structural equation modeling or hierarchical regression, would be needed to disentangle these relationships. Second, the cross-sectional design captures preferences at one academic stage, while career decisions typically evolve throughout adolescence. While the cross-sectional design cannot track changes in preferences over time, it provides the necessary baseline for Uganda's Form 5-6 transition window we targeted. Third, the RIASEC inventory, though validated, may not fully capture Ugandan-specific vocational dimensions like communal work values and agrarian orientations. Nevertheless, our study establishes the first benchmark for adapting it to Ugandan contexts. Fourth, our school-based sampling excluded out-of-school youth, additionally limiting generalizability.

These limitations suggest valuable directions for future research, including longitudinal designs with locally adapted measures to track preference development, comparative studies across African education systems to identify

structural factors enhancing or inhibiting alignment, guidance systems incorporating both RIASEC profiles and contextual pressure assessments, and Machine Learning approaches analyzing how personality-career congruence predicts long-term outcomes like university completion or job satisfaction in Ugandan cohorts.

4. CONCLUSION

This study reveals personality-career mismatches among Ugandan students, demonstrating how cultural values and systemic pressures override psychological alignment. While limited by its cross-sectional design and Western-derived RIASEC model (which may not fully capture Ugandan vocational contexts), these findings advance career guidance in three ways: quantifying RIASEC's 15% explanatory power locally, identifying priority gaps, and proposing actionable hybrid systems that integrate RIASEC with real-time data on regional opportunities and aspiration negotiation tools. Future work must validate a Ugandan-adapted RIASEC inventory and test these models longitudinally, but the immediate imperative is clear: systems prioritizing both personality and context could be more useful for the 72% of students underserved by traditional approaches.

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