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# Education without aptitude: mismatched vocational personalities for professional placements

## Abstract

Selecting academic fields at university level reflects career interests, which must be aligned with vocational personalities to avoid job dissatisfaction in the future. Since no earlier studies were conducted in Pakistan to investigate the compatibility between vocational personalities and career interests of university students, the current study aims to address this knowledge gap for the first time in the country. The study also highlights the role of aptitude testing before being enrolled in a university. As a quantitative survey, the study administered the O\*Net Interest Profiler on 1503 conveniently selected graduating male and female students at different universities in Pakistan, with the analysis of vocational personalities based on Holland's RIASEC codes. The results show that students of pure sciences, social sciences, architecture, fine arts, and psychology choose academic disciplines in alignment with their vocational personalities. Students of computer sciences, management sciences, electrical engineering, accounting & finance, and mathematics, however, do not select their academic fields in alignment with their vocational personalities. The studied male students were significantly more realistic, enterprising and conventional, whereas the female students were significantly more investigative, artistic and social. The study suggests that stakeholders should provide aptitude testing and career counseling at school and college levels to obtain the best human resources for the country.

**Keywords:** career interests, vocational personality, academic disciplines, aptitude, career counseling, Pakistan

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## Introduction

A career is the lifetime occupational progress that a person makes inside or outside the workplace (Sullivan & Baruch, 2009), and career planning is a very important cognitive process through which students decide about their careers. This process usually takes place in adolescence (Helwig, 2008; Lee & Rojewski, 2009; Witko et al., 2005) for academic purposes, with the career choices of students influenced by several psychosocial factors, such as their upbringing (Raque-Bogdan et al., 2013), parental suggestions (Chen & Fouad, 2013; Duffy & Dik, 2009; Dustmann, 2004; Fouad et al., 2016; Hairston, 2000; Howard et al., 2015; Kumar, 2016; Mokoro et al., 2014), suggestions by family members (Choo et al., 2012), peer pressure (Hashim & Embong, 2015), gender stereotyping (Gil-Flores et al., 2011; Novakovic & Fouad, 2013; Watt et al., 2012), vocational interests and perceived abilities (Russell, 2001), self-efficacy (Bandura et al., 2001; Garcia et al., 2015; Van Dinther et al., 2011), career competencies, career opportunities, resources (Akkermans et al., 2015; Akkermans & Tims, 2017; Colakoglu, 2011; Hall, 2004; Kuijpers et al., 2006; Parker et al., 2009; Walsh et al., 2005; Wittekind et al., 2010), work conditions (Bryson, 2004; Robinson et al., 2016), influence of role-models (Gibson, 2004), occupation value (Chen & Fouad, 2013; Raque-Bogdan et al., 2013), and career shock (Hirschi, 2010).

Earlier career-related research focused on several interlinked career aspects. Career choice and development, for example, is a process of developing and implementing a person's self-concept (Super, 1969; 1980), a process that requires a high level of

cognitive proficiency (Gottfredson, 1981). Career competencies, such as skills, knowledge and abilities of an individual that contribute to career development (Akkermans et al., 2013), lead to employability (Wittekind et al., 2010) and success (Arthur et al., 2005; Briscoe et al., 2006). Career resources, on the other hand, help individuals better understand their work in order to develop and maintain employability for a longer period (Bridgstock, 2009; Forrier & Sels, 2003). Career success is a work-related accomplishment and can be divided into subjective (personal job satisfaction) and objective (external incentives gained from the career) success (Arthur et al., 2005; Colakoglu, 2011; Eby et al., 2003; Heslin, 2005; Van Der Heijde & Van Der Heijden, 2006). Likewise, career shocks can also be positive, e.g. unexpected promotions, and negative, e.g. unexpected job losses (Akkermans et al., 2018).

In the past few decades, Holland's theory (Holland, 1997) has been a guide for career interest assessment, gaining significant international popularity. Holland suggests that vocational interest is an expression of one's personality, and that vocational interests can be conceptualised into six typologies – Realistic (R), i.e. preferring hands-on activities with practical goals; Investigative (I), i.e. preferring activities in which a person can work toward the resolution of mathematical or scientific problems; Artistic (A), i.e. often being comfortable with ambiguity in the workspace or a project, and preferring activities in which a person can use creativity and expressivity to create something new, such as art or music; Social (S), i.e. preferring activities in which a person can teach, help, or provide information to others; Enterprising (E), i.e. generally enjoying activities in which a person can work with others to lead or persuade them; and Conventional (C), i.e. preferring work with data, such as numbers or records, to present and store it in a systematic and orderly way. This theory also suggests measuring a person's primary and secondary interests during the evaluation so that they can have a wide range of career choices. The congruence hypothesis in Holland's theory suggests that individuals are more likely to experience job satisfaction, stability and success when there is a high degree of match, or congruence, between their personality type and their work environment. This hypothesis is grounded in the idea that people seek environments that allow them to use their skills and abilities, express their values and attitudes, and take on agreeable roles and problems. Researchers have supported this model and have highlighted its contribution to research, career evaluation, and career counseling (Armstrong et al., 2003; Darcy & Tracey, 2007; Su et al., 2009).

Education, in addition to its role in cognition, moral development (Husain, 2021b), and psychosocial health (Husain, 2021a), is usually directed towards its social output (Eisele, 1980), enabling students to be ready to perform the desired social roles and apply knowledge in practical situations (Husain et al., 2023; Moran, 2018). The educational disciplines,

therefore, must be aligned with the career interests of the students. A meta-analysis (Hanna & Rounds, 2020) investigated 100 years of earlier research on career interests, leading to a significant relationship between career interest and career choice. Pakistan, the sixth largest population in the world, is a developing country, and the state of education in Pakistan is not satisfactory (Husain & Faize, 2021). Apart from a documented National Education Policy, the country deeply lacks research in monitoring and evaluating the education being imparted in public and private institutions. Educational methodologies are not sufficiently aligned with modern means of information management (Faize & Husain, 2021; Faize et al., 2018), and students face substantial issues, especially at higher levels (Faize, 2015). Teachers, on the other hand, also face several psychosocial problems (Husain et al., 2016). The current study is the first such study in Pakistan to measure the career interests of Pakistani students using Holland's RIASEC codes, to analyse the compatibility of career interests with the vocational personalities of the students.

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## Method

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### Participants

The current study covers 1503 graduating students selected from different universities in Pakistan, including both male ( $n = 785$ ) and female ( $n = 718$ ) students enrolled in different Bachelor of Science (BS) disciplines, which, for the purpose of this study, were categorised into 9 domains, e.g. Computer Sciences, Management Sciences, Pure Sciences (Biology, Chemistry, Physics, etc.), Social Sciences (Sociology, Anthropology, Social Work, etc.), Electrical Engineering, Accounting & Finance, Mathematics, Architecture & Fine Arts, and Psychology. Psychology was analysed separately from the social sciences due to the special interests of the researchers.

### Instrument

An "Interest Profiler" (Lewis & Rivkin, 1999) was administered in the current study along with a brief demographic schedule. The Interest Profiler is based on John Holland's theory of vocational personality, which proposes six vocational personality types. Holland believed that people can be described by one of these six vocational personality types, i.e. Realistic, Investigative, Artistic, Social, Enterprising and Conventional. The self-administered scale comprises 72 items and can be completed in 5 to 10 minutes, with each item having three possible options, i.e. like, unsure, and dislike. Only the frequency of likes is counted for calculating the results. The initial reliability of the test and its sub-scales was above 90 as recorded by its authors, and the test was considered valid by its authors in different groups based on age, gender, ethnicity, educational level, occupational group, etc. The Interest Profiler also provides a list of various academic disciplines, associating those disciplines

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with compatible professions. Furthermore, the test recommends different professions based on specific vocational personalities.

## Procedure

The researchers approached the graduating students at different universities in Pakistan with the help of faculty members. The instrument of the current study, which is a self-respondent inventory, was administered in groups, and the instructions and purpose of the study were made clear to the participants, who were willingly selected. The data gathered was analysed using the Statistical Package for Social Sciences, with all the procedures performed in this study conducted in accordance with the 1964 Helsinki declaration.

## Results

The Interest Profiler showed good reliability, with a Cronbach's alpha value of 0.871 (Table 1), and all the sub-scales of the instrument were also found reliable with alpha values between 0.621 to 0.743 (Table 1).

The most represented vocational personality of Pakistani students was 'social', and the least represented was 'realistic' (Tables 1 & 2). The results show that students of pure sciences, social sciences, architecture, fine arts, and psychology chose academic disciplines aligned with their career interests (Tables 2, 3, 4 & 5), while the students of computer sciences, management sciences, electrical engineering, accounting & finance, and mathematics, however, did not select their academic fields in alignment with their career interests (Tables 2, 3, 4 & 5). Social vocational personality remained the primary vocational personality for the majority of students in each academic discipline (Table 3).

A gender-based analysis (table 6) revealed that the studied male students were significantly more realistic ( $M = 5.27$  vs  $4.62$ ;  $p = 0.000$ ; Cohen's  $d = 0.25$ ), enterprising ( $M = 5.38$  vs  $4.71$ ;  $p = 0.027$ ; Cohen's  $d = 0.11$ ), and conventional ( $M = 6.02$  vs  $4.46$ ;  $p = 0.000$ ; Cohen's  $d = 0.52$ ); while female students were significantly more investigative ( $M = 6.09$  vs  $5.76$ ;  $p = 0.000$ ; Cohen's  $d = 0.11$ ), artistic ( $M = 6.25$  vs  $5.61$ ;  $p = 0.000$ ; Cohen's  $d = 0.21$ ), and social ( $M = 7.52$  vs  $6.32$ ;  $p = 0.000$ ; Cohen's  $d = 0.41$ ).

**Table 1**  
Descriptive statistics of Career Interest Profiler ( $n = 1503$ )

Variable	Items	$\alpha$	M	SD	%	Range		Skewness	Kurtosis
						Potential	Actual		
Career Interest Profiler	72	0.871	34.051	11.113	47.292	0-72	1-72	0.104	0.062
Realistic (R)	12	0.621	4.962	2.593	41.351	0-12	0-12	0.160	-0.520
Investigative (I)	12	0.699	5.921	2.878	49.346	0-12	0-12	0.009	-0.646
Artistic (A)	12	0.727	5.921	2.962	49.346	0-12	0-12	0.028	-0.731
Social (S)	12	0.736	6.900	2.974	57.496	0-12	0-12	-0.219	-0.669
Enterprising (E)	12	0.635	5.067	2.601	42.221	0-12	0-12	0.228	-0.392
Conventional (C)	12	0.743	5.279	3.033	43.995	0-12	0-12	0.119	-0.0807

Note.  $\alpha$  = Cronbach's alpha; M = Mean; SD = Standard Deviation.

Source: authors' own work.

**Table 2**  
Mean Scores of the students from different academic disciplines on each career interest and their primary and secondary areas of career interest

Academic Disciplines	N	R	I	A	S	E	C	PI	SI
Computer Sciences	366	5.175	5.773	5.617	6.377	5.213	6.265	S	C
Management Sciences	414	5.104	5.626	5.720	6.582	5.715	5.686	S	A
Pure Sciences	103	4.602	7.078	5.874	7.379	3.883	4.146	S	I
Social Sciences	163	5.196	5.859	6.730	6.926	5.166	4.988	S	A
Electrical Engineering	113	5.071	5.398	5.681	6.611	4.726	5.221	S	A
Accounting & Finance	70	5.343	6.100	6.543	6.943	5.643	5.386	S	A
Mathematics	11	4.364	4.818	5.000	7.364	5.273	5.182	S	E
Architecture & Fine Arts	53	5.343	6.100	6.543	6.943	5.643	5.386	S	A
Psychology	210	4.243	6.643	5.962	8.314	4.257	3.529	S	I

Note. N – Number of students; R – Realistic; I – Investigative; A – Artistic; S – Social; E – Enterprising; C – Conventional; PI – Primary Interest; SI – Secondary Interest.

Source: authors' own work.

**Table 3**

Percentage of discipline-wise students according to their primary career interest

Academic Disciplines	Realistic	Investigative	Artistic	Social	Enterprising	Conventional
Computer Sciences	0.00	22.68	20.49	24.32	11.75	20.77
Business & Management Sciences	0.00	22.71	20.05	29.23	12.80	15.22
Pure Sciences	0.00	43.69	18.45	29.13	2.91	5.83
Electrical Engineering	0.00	22.12	24.78	32.74	9.73	10.62
Accounting & Finance	0.00	28.57	21.43	25.71	8.57	15.71
Psychology	0.00	28.57	19.05	45.71	3.81	2.86
Maths	0.00	9.09	18.18	54.55	9.09	9.09
Architecture & Fine Arts	0.00	13.21	35.85	37.74	3.77	9.43
Social Sciences	0.00	20.86	32.52	28.22	7.98	10.43

Source: authors' own work.

**Table 4**

The compatible academic disciplines for different career interests as stated in the instrument

Career Interest	Compatible Academic Disciplines
Realistic	Trades people – carpenters, electricians, mechanics, plumbers; Agriculture and forestry; Engineering; military
Investigative	Biology, chemistry, physics; Computer programmers, computer engineers; Physician, pharmacist, psychologist, veterinarian; Technical writer
Artistic	Musicians, artists, graphic artists, advertising, design, writers/editors
Social	Nursing, counselling, teaching, clergy
Enterprising	Business management, sales, politics, small business owner, real estate
Conventional	Accounting, banking and finance, clerical/secretarial, business administration, insurance – adjuster/underwriter

Source: authors' own work.

**Table 5**

The compatibility between Primary and Secondary Career Interests and Opted Academic Disciplines

Opted Academic Disciplines	Primary Interest	Secondary Interest	Ideal Interest/s
Computer Sciences	Social ✖	Conventional ✖	Investigative
Management Sciences	Social ✖	Artistic ✖	Enterprising, Conventional
Pure Sciences	Social ✖	Investigative ✓	Investigative
Social Sciences	Social ✓	Artistic ✖	Social
Electrical Engineering	Social ✖	Artistic ✖	Realistic
Accounting & Finance	Social ✖	Artistic ✖	Conventional
Mathematics	Social ✖	Enterprising ✖	Investigative, Conventional
Architecture & Fine Arts	Social ✖	Artistic ✓	Artistic, Realistic
Psychology	Social ✓	Investigative ✓	Social, Investigative

Source: authors' own work.

**Table 6**

The differences in the vocational personalities of boys and girls

Variable	Boys		Girls		t (1501)	p	Cohen's d
	M	SD	M	SD			
Realistic	5.273	2.507	4.623	2.644	4.892	0.000	0.253
Investigative	5.764	2.798	6.093	2.955	2.217	0.027	0.114
Artistic	5.618	2.896	6.253	2.999	4.179	0.000	0.216
Social	6.327	2.954	7.525	2.869	7.959	0.000	0.411
Enterprising	5.389	2.575	4.714	2.586	5.059	0.000	0.261
Conventional	6.020	2.889	4.469	2.981	10.240	0.000	0.529

Source: authors' own work.

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**Table 7**

The differences in matching the ideal interest of boys and girls

Variable	Ideal Interest/s	Boys		Girls		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Computer Sciences	Investigative	5.717	2.856	5.928	2.822	0.624	0.533	–
Management Sciences	Enterprising	5.909	2.385	5.410	2.349	2.088	0.037	0.211
	Conventional	5.988	2.752	5.211	2.728	2.810	0.005	0.283
Pure Sciences	Investigative	7.219	3.149	7.014	2.851	0.326	0.745	–
Social Sciences	Social	6.087	3.355	7.543	2.913	2.955	0.004	0.468
Electrical Engineering	Realistic	5.232	2.322	4.645	2.317	1.199	0.233	–
Accounting & Finance	Conventional	6.000	3.421	4.771	3.456	1.495	0.140	–
Mathematics	Investigative	3.333	2.517	5.375	3.204	0.984	0.351	–
	Conventional	4.000	1.732	5.625	2.925	0.887	0.398	–
Architecture & Fine Arts	Artistic	6.643	3.365	7.026	2.631	0.433	0.667	–
	Realistic	4.571	2.875	4.615	2.592	0.053	0.958	–
Psychology	Social	6.429	2.686	8.604	2.814	3.831	0.000	0.778
	Investigative	6.500	2.822	6.665	3.042	0.269	0.788	–

Source: authors' own work.

A discipline-wise analysis was also conducted to measure the gender-based differences in the appropriate selection of academic disciplines (table 7), revealing that male management sciences students ( $M = 5.90$  for enterprising vocational personality &  $5.98$  for conventional vocational personality vs  $5.41$  &  $5.21$  respectively;  $p = 0.037$ ; Cohen's  $d = 0.21$ ) selected their academic discipline significantly better than female students of the same discipline. Female students of social sciences (the ideal vocational personality being social;  $M = 7.54$  vs  $6.08$ ;  $p = 0.004$ ; Cohen's  $d = 0.46$ ) and psychology (the ideal vocational personality being social;  $M = 8.60$  vs  $6.42$ ;  $p = 0.000$ ; Cohen's  $d = 0.77$ ), on the other hand, selected their academic disciplines significantly better than male students of the same disciplines.

## Discussion

The current investigation was designed to measure the compatibility between career interests and vocational personalities, with a survey of Pakistani university students conducted to see if the students had chosen their academic disciplines in accordance with their vocational personalities. The instrument used in the study proposed the ideal academic fields for all six RIASEC personalities, and the respondents were assessed based on these ideal primary and secondary vocational personalities (Table 4). The results revealed that students of pure sciences, social sciences, architecture, fine arts, and psychology chose their academic disciplines in alignment with their career interests. On the other hand, students of computer sciences, management sciences, electrical engineering, accounting & finance, and mathematics did not select academic fields aligned with their career interests. This mismatch is mainly because of the non-availability of

career counseling services in Pakistani educational institutions, whereas career counseling is commonly offered in the educational institutions of developed countries. Most of the educational institutions in Pakistan do not offer any aptitude testing or career counseling for students (Khan, 2010; Yaqoob et al., 2017). In addition to students, the general population in Pakistan is at risk of several psychological problems (Husain, 2018), with the local culture not permitting people to look for professional counseling (Husain, 2020), and the need for professional counseling in the country not significantly realised (Husain & Faize, 2020). The educated population, however, must acknowledge the need for career counseling services within the educational system of Pakistan (Zahid et al., 2020), which should equally address both students and teachers, as teachers also need counseling to overcome depression, anxiety and stress (Husain et al., 2016).

The gender-based analysis revealed that the studied male students were significantly more realistic, enterprising and conventional; while female students were significantly more investigative, artistic and social, and scholars identified significant gender-based differences in career interests (Morris, 2016). Social and artistic qualities, for example, were generally found to be more prevalent among females (Betz & Klein, 1996; Costa et al., 1984; Gianakos & Subich, 1988; Henry & Bardo, 1987; Smart, 1989; Varca & Shaffer, 1982; Walsh et al., 1986; Walsh & Huston, 1988). Some studies (Murray & Hall, 2001) found greater manifestations of Realistic career interests in males compared to females. A meta-analysis revealed that men prefer working with objects, while women prefer working with people (Su et al., 2009). Men showed strong realistic and investigative interests, whereas women reflected strong artistic and conventional interests (Su et al., 2009). A significant increase in enterprising



interests among females and a significant decrease in realistic, investigative, and artistic interests among males was also observed over time (Bubany & Hansen, 2011). The gender-based differences in career interests have greater associations with cultural and vocational demands. Women in many other parts of the world (Warner Colleen & Warner, 2005) have been assigned to the role of housewives instead of being allowed to work professionally. However, women have started broadening their career inspirations in the last few decades, opting for unconventional careers (Inglehart et al., 2003). The highest mean score for all academic disciplines belonged to social vocational personality, regardless of gender, a trend that can be attributed to the cultural emphasis on collectivism and social harmony, which prioritises interpersonal relationships and communal well-being. Pakistani society highly values professions that involve helping others and maintaining social cohesion, such as teaching, healthcare, and social work, in line with the characteristics of the social personality type. The same role of gender socialisation and stereotypes about career interests was also established by earlier researchers (Morris, 2016).

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### Recommendations

The findings of the current study highlight the incompatibility between career interests and academic choices among Pakistani students, reflecting the adverse effects of the unavailability of career counseling services in the educational institutions of the country, emphasising the importance of career counseling and aptitude testing services inside the educational institutes of the country. Making career-related decisions is not an easy task for most students (Bland & Roberts-Pittman, 2014). Selecting a single occupation from among thousands is a lifetime decision (Kochhar, 1984), and remains a crucial task for students, although for most students, their career choice is made by their parents (Taveira et al., 1998). Career counseling is necessary throughout one's career, for professional growth and success (Whiston et al., 2003). The effectiveness of career counseling services has been widely established to facilitate students in selecting their careers and managing psychosocial stressors in this regard (Appleby, 2018; Atchley et al., 2012; Ciarocco, 2018; Renn et al., 2014; Schwartz et al., 2018). Career selection is a stressful task for students, and career counseling can help reduce this stress (Eley et al., 2007), enabling students to choose the best-suited career. Students who receive career counseling are more passionate about their careers, more productive, have high retention rates, and are highly motivated in their professions (Whiston & Quinby, 2009), while students who do not receive proper career counseling more often make wrong career choices (Salami, 2008). The Ministry of Education of Pakistan and the management of educational institutions of the country are therefore advised to initiate career counseling and aptitude testing services within

the existing educational setups, while students are also advised to consult online resources for aptitude testing and measuring their career interests. This strategy is also well established in helping students choose an appropriate career (Beard et al., 2012; Golding et al., 2018), and they can also consult senior students and alumni for advice (Lawson, 2018), or pay visits to different organisations in order to observe the work and decide about their career (Beard et al., 2012).

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### Limitations

As the study lacked funding and was conducted with limited resources, its scope was restricted to only bachelor students. The findings could have been more intriguing had we also included students pursuing MS, MPhil, and PhD degrees, so future researchers are encouraged to incorporate participants from diverse educational backgrounds to obtain a more comprehensive perspective. Furthermore, the current study could have been enriched by including individuals from various professions in addition to students.

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### Conclusion

The current study is the first of its nature in Pakistan, with the aim to measure the career interests of students and analyse the compatibility between vocational personalities and career interests. The current study is highly significant in its theory and scope, revealing that many Pakistani students have been unable to develop valid and reliable career interests, the prime reason being the lack of career-based assessments and counseling in Pakistani educational institutions. The current study also aims to sensitise the Ministry of Education, the Higher Education Commission, and educational institutions in the country to recognise this huge gap within the educational system and to address it professionally. The negative consequences of this shortfall can result in job-related dissatisfaction and poor organisational performance, so students should be evaluated for their vocational personalities before university admission.

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