Developing Future Talents for Employability: Big Five Personality Traits as a Catalyst for 21st-Century Skill Development

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ABSTRACT

The findings of this study highlight significant implications for higher education institutions (HEIs), educators, curriculum designers, and policy makers in preparing graduates for the demands of the modern workforce. The absence of notable differences in personality traits and generic skills across academic disciplines namely Social Sciences, Arts & Humanities, and Science, Technology, Engineering, and Mathematics (STEM) suggests that these competencies are not inherently determined by one's field of study. Instead, prior research indicates that the university's learning environment, institutional culture, and teaching strategies play a crucial role in shaping students' personality development and acquisition of generic skills. These results support the integration of generic skills training and personality development programs across all faculties. Embedding competencies such as teamwork, communication, leadership, creativity, and critical thinking into both curricula and co-curricular activities ensures that all students are equally equipped for employability and lifelong learning. Furthermore, the study identified a moderate positive correlation ($r = 0.598$) between personality traits and generic skills, highlighting that traits such as conscientiousness, openness, and extraversion significantly influence students' capacity to acquire and apply these skills. In general, these findings align with the national agenda of HEIs in Malaysia to foster holistic talent development and emphasize the need for integrated policies that promote the cultivation of transferable skills. They also call for enhanced educator training in active learning and personality-based pedagogical approaches, thereby reinforcing the importance of graduate generic skills in developing future-ready talent.

Keywords
Big Five Personality Traits; Generic Skills; Future Talents; Employability; Undergraduate Students

Introduction

Higher Education Institutions (HEIs) play an important role in developing future talents by embedding employability skills into the curriculum. Nevertheless, a significant gap remains between what is taught in universities and what is expected in the professional world, highlighting a critical issue in higher education's responsiveness to industry demands (Jackson, 2016; Finch et.al, 2013). Employability is not a static trait but a lifelong capability that allows individuals to remain relevant and mobile in the job market. As the workforce becomes more fluid, graduates are expected to move between roles and industries throughout their careers. According to the Organisation for Economic Co-operation and Development (OECD, 2019), continuous reskilling and upskilling of knowledge, skills, and abilities are crucial for sustaining long-term career success. In this regard, employability is not merely about securing the first job after graduation, but it is about sustaining employment and contributing meaningfully across one's professional lifespan. The global labour market now values learning outcomes that can be directly applied to real-world problems. Succi and Canovi (2019) state that many students graduate without sufficient exposure to real-world challenges, making it difficult for them to apply theoretical knowledge in practical settings. As such, policies related to education and training cannot be developed in isolation from labour market needs. Employers, educators, and policymakers must collaborate to ensure that qualifications are aligned with industry standards and internationally recognized competencies (Knight and Yorke, 2003).

One of the primary barriers preventing higher education graduates from transitioning smoothly into the workforce is the persistent mismatch between the skills they acquire during their studies and those demanded by modern workplaces.

In the 21st-century, employers require more than just high academic qualifications such as a strong degree classification or subject-specific knowledge. Instead, they increasingly expect graduates to possess a robust set of employability skills and attributes that enable the students to thrive in dynamic and competitive environments (Jackson, 2016). Despite the emphasis on the employability skills, employers continue to struggle in finding suitable candidates among fresh graduates due to deficiencies in generic skills, which hinder their ability to secure job opportunities (Goodman, Sands and Coley, 2015).

With the beginning of Industry 4.0, the demand for students to possess not only conventional generic skills but also competencies in digital literacy, media and information fluency, and technological adaptability has become more critical for workforce competitiveness (Tjandrawina, 2016). The rise of the digital revolution, automation, and artificial intelligence (AI) has reshaped the nature of jobs, and the skills required, as the modern workplace continues to evolve in ways that demand new capabilities from graduates. Employers now place increasing emphasis on generic skills and transferable competencies that support collaboration, creativity, innovation, and the ability to learn continuously (World Economic Forum, 2020). For example, the American Management Association (AMA) highlights that strategic thinking, creativity, collaboration, and effective communication are among the most sought-after attributes in today's global economy (AMA, 2023). In Malaysia, TalentCorp (Talent Corporation Malaysia Berhad), a government agency under the Ministry of Human Resources, plays a key role in strengthening the nation's talent ecosystem. It facilitates strategic partnerships among the government, private sector, and academia to co-develop talent strategies aimed at enhancing graduate employability and aligning the local workforce with industry needs and national economic priorities. In today's hyperconnected world, the ability to collaborate across borders and engage with diverse teams is a critical advantage.

Therefore, this study aims to examine final-year undergraduate students' self-evaluations of their personality traits based on the Big Five Personality model and their perceptions of acquiring Generic Skills, as defined by UTM's seven key attributes. The goal is to contribute to the development of future-ready talents for employability and to gain insights into students' preparedness for the workforce. The research questions of the study are formulated as follows:

1. Are there any significant differences in the Big Five personality traits among students from different academic disciplines (STEM and Social Sciences, Arts & Humanities)?
2. Are there any significant differences in the UTM Attribute Generic Skills among students from different academic disciplines (STEM and Social Sciences, Arts & Humanities)?
3. To what extent do the Big Five personality traits significantly influence the development of students' generic skills?

Literature Review

Future Talents at Risk: A Higher Education Dilemma

Nowadays, university students have become increasingly aware of the importance of acquiring generic skills (also referred to as soft skills), which are highly valued by employers and industries (Gang, Shazia and Chua, 2020). These include competencies such as teamwork, communication, leadership, problem-solving, and critical thinking. In the era of digital technology, Tjandrawina (2016) emphasizes that to remain competitive, students must be innovative, digitally literate, and proficient in using multimedia, information and communication technology (ICT), and technological tools. However, as reported by Rahmah et al., (2011), the skills and qualifications of today's graduates often fall short of industry expectations, particularly in problem-solving and interpersonal competencies such as effective communication, active learning, and the ability to give and receive constructive feedback. Recent discourse suggests that to secure meaningful employment, students must adequately prepare themselves to meet employers' evolving requirements. Setiaji (2020) highlights that, in the 21st century, students must equip themselves with skills such as communication, teamwork, creativity, and critical thinking to be workforce ready. As a result, students must become more adaptable, inquisitive, future-oriented, and collaborative. The integration of digital tools and active learning approaches in teaching can further foster open-mindedness and support the development of a future-ready mindset.

In addition to balancing academic achievement with the acquisition of generic skills, today's graduates are expected to develop positive character traits to remain competitive in the workforce, as both academic performance and individual personality significantly influence work performance (Delima, 2019). According to Azlina (2009),

personality refers to an individual's outward characteristics, encompassing patterns of thought, behaviour, and emotions. Similarly, Feist, Feist, and Roberts (2018) state that a person's personality consists of enduring patterns of thought, emotion, and behavior that uniquely characterize an individual and influence their interactions with the environment. Zaliza and Mohd Safarin (2014) argue that one of the main factors contributing to the employability challenges faced by Malaysian graduates is the lack of generic skills. Therefore, to enhance employability, students must not only achieve strong academic results but also develop relevant skills and positive personality traits that are increasingly demanded by the job market (Ah Gang, et al., 2020).

Recent research related to generic skills and employability (e.g., Patel, Puah and Kok, 2024; Iqbal et al., 2023; Kornelakis and Petrakaki, 2020) have emphasized the importance for graduates to prioritize core generic skills. These include adaptability to the ever evolving and highly competitive job market, a willingness to learn new skills, a broad and open mindset, and the ability to maintain a positive attitude. A JobStreet survey conducted in 2013 revealed that employers increasingly value strong generic skills over academic achievements when hiring fresh graduates. Nevertheless, most recent research findings (e.g., Mohamad et al., 2025; Mahajan, Gupta and Misra, 2022; Gedye and Beaumont, 2018) continue to highlight a significant gap, indicating that many graduates still lack the market-relevant employability skills needed to succeed in the 21st-century workplace. Additionally, a study by the British Council and Think Global (2011) found that, for many employers, graduates' global awareness and cultural intelligence are often considered more valuable than academic qualifications. Similarly, as according to Ismail (2016), good academic performance alone does not guarantee employment for Malaysian graduates, as generic skills play a crucial role in job acquisition. Yen et al., (2023) reported that Malaysian fresh graduates struggle to secure jobs due to poor communication skills, low English proficiency, and unfavourable attitudes. In a nutshell, to effectively navigate workplace changes and technological advancements, students must also cultivate strong personality traits alongside their skill sets. The subsequent discussion will highlight the significance of personality traits as a key determinant of employability.

The Big Five Model of Personality Traits

The Big Five Personality Traits theory was initially introduced by Donald W. Fiske in 1949 and was later expanded by prominent researchers such as Warren T. Norman and Douglas N. Smith in 1967, Lewis Goldberg in 1981, as well as Robert R. McCrae and Paul T. Costa Jr in 1987. According to Maddi et al., (2009), personality is defined as an individual's psychophysical system that determines their both similarities and differences characteristic patterns of behavior, thought, and emotion. Colquitt et al. (2011) further explained that personality consists of internal characteristics that influence emotions and behaviors. Bergner (2020) concludes that personality is the psychological aspect of a person that remains consistent over time and across different situations. The definition emphasizes that personality is not just a series of random behaviors, but a stable set of psychological traits that shape how a person thinks, feels, and behaves in various contexts. According to Goldberg (1992), the Big Five Personality Model is widely recognized as it provides a well-established and validated measure of personality traits. Bainbridge, Ludeke, and Smillie (2022) conducted large-scale research and found that more than 80 percent of commonly used psychological trait scales closely align with at least four of the Big Five personality traits, with many showing very strong correlations ($r > .90$). They concluded that the Big Five model is a reliable and effective framework for organizing most individual personality trait measures. The Big Five personality model that comprising *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, and *Neuroticism* (OCEAN) has long been celebrated for its empirical robustness and predictive validity across diverse domains (e.g., job performance, wellbeing). In the rapidly evolving landscape of Industry 4.0, understanding the strengths and limitations of the Big Five Personality traits remains crucial especially for Generation Z, whose entry into the workforce aligns with significant technological advancements.

Openness (O)

Smith and Canger (2004) identified innovation, open-mindedness, and unconventional thinking as key characteristics of individuals who score high in openness to experience. According to Viswanath (2019), individuals high in this trait are often described as intelligent, creative, and inquisitive. Costa and McCrae (1992), renowned for their contributions to personality psychology, developed the widely recognized Five-Factor Model (FFM), also known as the Big Five. They explained that openness to experience is reflected in intellectual curiosity, self-awareness, and a tendency toward individualism and nonconformity. In contrast, individuals with low levels of openness typically prefer routine over variety, gravitate toward familiar experiences, and show limited interest in abstract thinking, artistic expression, or creative pursuits (Ah Gang et al., 2020).

Conscientiousness (C)
According to Costa and McCrae (1992), individuals' conscientiousness is defined as the degree to which they have the attribute of perseverance, value planning and are goal oriented. Whereas Zhao and Seibert (2006) stated that self-control, organization, work discipline, responsibility for others, and acceptance of the norms are all characteristics of conscientiousness. Meanwhile, people with low conscientiousness are more careless, negligent, disorganized and impulsive (van Lieshout, 2000).

Extraversion (E)
McCrae and John (1992) described extraversion as a trait found in individuals who are cheerful, energetic, sociable, warm, talkative, and sometimes assertive. People who score high in extraversion tend to be outgoing, enthusiastic, and enjoy interacting with others, especially in large groups (Zhao and Seibert, 2006). In contrast, individuals with low levels of extraversion often prefer solitude and are typically quiet, reserved, and self-reliant. According to Bakker, et al., (2006), extraversion is considered a positive personality trait, as those who exhibit high levels of it are usually confident, dominant, energetic, and enjoy engaging in enjoyable and stimulating activities.

Agreeableness (A)
Agreeableness is a personality trait that reflects how individuals relate to others and their general outlook on human nature (Patitsa, et al., 2021). People who exhibit high levels of agreeableness are typically humble, selfless, cooperative, and trustworthy. They tend to avoid conflict and show kindness and concern for the well-being of others (Sahinidis, et al., 2020). According to Costa and McCrae (1992), agreeable individuals value social harmony, collaboration, honesty, decency, and trust. They generally hold a positive view of humanity and strive to maintain good relationships with those around them.

Neuroticism (N)
Neuroticism is characterized by a tendency to be sensitive, emotional, and easily affected by negative feelings (Chew and Dillon, 2014). According to Costa and McCrae (1992), neuroticism refers to the extent to which individuals experience negative emotions and how strongly they react to emotional stress. People who score high in neuroticism are often prone to irritability, anger, self-consciousness, anxiety, worry, and sadness.

Understanding the personality traits of Generation Z is essential for improving their future employability, especially in today's fast-changing, technology-driven world. Born between the mid-1990s and early 2010s, Generation Z is the first fully digital-native generation. They are entering the workforce during the Fourth Industrial Revolution, a time that requires not only technical skills but also strong generic skills such as adaptability, communication, critical thinking, and teamwork (OECD, 2019). As highlighted by Seemiller and Grace (2017), gaining insight into Generation Z's personality traits enables educators and employers to design more effective development strategies that foster essential skills, enhance engagement, and bridge the gap between graduates' capabilities and industry expectations.

21st-Century Generic Skills Development

The concept of 21st-century skills was introduced in the United States in 2007 to enhance educational achievements and workforce readiness (Salih, 2020). Khalim Zalinal et al., (2015) defines generic skills as a group of skills or aptitudes necessary to achieving the goals of higher education, including meeting the needs and demands of the jobs market, pursuing lifelong learning, and practising good citizenship. In 2015, the World Economic Forum released a report called *New Vision for Education: Unlocking the Potential of Technology*, which addressed the growing gap in 21st-century skills and explored how technology can help bridge this gap. The report identified 16 important skills that students need to succeed in today's world. These include six basic skills, like reading, writing, math, and science. The other ten skills are grouped into two categories: "competencies" and "character qualities". Competencies are the skills students use to handle complex tasks, such as working well with others (collaboration), expressing ideas clearly (communication), and thinking critically to solve problems. Character qualities refer to how students deal with a changing world for example, being curious, flexible, and aware of different cultures and social situations. These skills go beyond academic knowledge and are essential for students to thrive in both life and work as shown in Table 1.

Table 1 16 Skills for Future Talents in the 21st-Century

21st-CENTURY SKILLS		
Foundational Literacies	**Competencies**	**Character Qualities**
How students apply core skills to everyday tasks	How students approach complex challenges	How students approach their changing environment
1. Literacy 2. Numeracy 3. Scientific literacy 4. ICT literacy 5. Financial literacy 6. Cultural and civic literacy	7. Critical thinking/ problem-solving 8. Creativity 9. Communication 10. Collaboration	11. Curiosity 12. Initiative 13. Persistence/ grit 14. Adaptability 15. Leadership 16. Social and cultural awareness

Source: World Economic Forum, New Vision for Education (2015)

At Universiti Teknologi Malaysia (UTM), a public and research university in Malaysia, generic skills are cultivated through a range of in-class learning activities such as group projects, presentations, role-playing, brainstorming sessions, and internships. In addition, out-of-class activities are also organized to further support students in building these essential skills. To ensure the systematic development of generic skills, UTM has identified seven key Graduate Student Attributes, which include communication skills, thinking skills, scholarship, leadership and teamwork, adaptability, global citizenship, and enterprising skills. These attributes align closely with the core competencies emphasized in 21st-century skills frameworks. In this study, each Faculty in UTM is grouped under education category according to Malaysia's National Education Code (NEC) 2020 as shown in Table 2.

Table 2 Malaysia's National Education Code (NEC) 2020

FIELDS	NEC CODE	DISCIPLINES
Science, Technology, Engineering, and Mathematics (STEM) Focus: Pure sciences, technology, mathematics, engineering, ICT, technical		
Natural Sciences, Mathematics & Statistics	05	Biology, Physics, Chemistry, Environmental Science, Mathematics, Statistics
Information & Communication Technologies (ICT)	06	Computer Science, Software Engineering, Data Science, Artificial Intelligence (AI), Networking
Engineering, Manufacturing & Construction	07	Civil, Mechanical, Electrical, Chemical, Industrial, Architecture, Construction
Agriculture, Forestry, Fisheries & Veterinary	08	Agriculture, Animal Science, Food Science, Aquaculture, Forestry
Health & Welfare (Science-related)	09	Medicine, Dentistry, Pharmacy, Nursing, Biomedical, Veterinary, Public Health
Social Sciences, Arts & Humanities Focus: Human behaviour, society, economy, politics, culture, psychology, communication, education, law, business and management studies		
Education	01	Education science, Training for pre-school teachers, Educator training
Arts and Humanities	02	History, Audio-Visual Techniques And Media Production, Fashion, Interior Design, Fine Arts. Craft Skill, Films, Religion Studies, Languages
Social Sciences, Journalism & Information	03	Economics, Psychology, Political Science, Sociology & Cultural Studies, Behavioural Sciences, Journalism, Library, Media & Communication
Business, Administration & Law	04	Business, Administration, Law, Accounting, Finance, Banking, Management, Marketing, Work Skills, Secretarial & Office Studies

Source: Summarization by Authors based on Malaysia's NEC 2020

Since 2020, several empirical studies. have highlighted the importance of personality dimensions, especially the Big Five model, in explaining why students thrive differently across disciplines. Recent evidence suggests that shared values, norms, and ways of thinking attract students with diverse personality patterns. For example, Kokkinos, Antoniadou & Voulgaridou (2024) conducted a study among 1825 Greek university students, using the Five Factor Model (FFM) found that social sciences & humanities students belonged to the overcontroller profile (higher neuroticism, lower extraversion), whereas health sciences students aligned with resilient profiles (low neuroticism, high conscientiousness and agreeableness). Wen et al (2021), conducted a study using data from two agricultural universities in China and this study examines the impact of students' choice of major on their personality traits. Utilizing the Sixteen Personality Factor (16PF) and the Neuroticism Extraversion Openness Five-Factor Inventory (NEO-FFI) revealed no significant personality differences among freshmen. However, after three years of study, pronounced distinctions emerged. Students pursuing agriculture-related majors (ARM) became more socially reserved

and demonstrated weaker communication skills, whereas those in non-agriculture-related majors (NARM) developed stronger self-expression and communication abilities. These findings suggest that personality development is shaped not only by students' chosen field of study but also by the broader educational framework and teaching methods embedded within each discipline.

In this study, Trait Activation Theory (TAT) is employed to illustrate how the Big Five personality traits influence the development of students' generic skills, suggesting that these traits are expressed and cultivated when situational cues in the learning environment activate them. According to Ted & Bunnet (2003), Trait Activation Theory (TAT) is a psychological model that describes how personality traits are revealed when individuals encounter specific situational cues. This theory has gained significance in social science fields such as organizational behavior (Manteli & Galanakis, 2022), human resource management (Noe et al., 2017), and educational studies (Wu et al., 2022). TAT suggests that personality traits do not manifest consistently in every situation; instead, specific traits become "activated" when people face environments pertinent to those traits. This viewpoint clarifies why a single person might display varying behaviors in different situations, even with consistent personality traits. The core concept of TAT is that traits exist as hidden potentials within individuals. An important application of Trait Activation Theory (TAT) in educational settings lies in its ability to inform instructional design by creating learning environments that activate desirable traits, such as teamwork, communication, or critical thinking. This, in turn, fosters the development of generic skills alongside disciplinary knowledge. TAT also underscores the concept of *situational strength* (Judge & Zapata, 2015). Strong situations are characterized by clear rules, structured tasks, and explicit expectations that tend to restrict the expression of individual traits, resulting in more uniform behavior across students. Conversely, weak situations allow greater freedom for traits to surface. For example, a student high in openness to experience may display creativity and intellectual curiosity in open-ended research projects, whereas the same trait may be less evident in a rigid, lecture-based classroom. Thus, the theory emphasizes that the connections between trait strength and situational strength shapes how, when, and to what extent personality traits are expressed through behavior.

As a conclusion, HEIs responsibility is not only about delivering disciplinary knowledge but also need to equip students with appropriate skills, values, and resilience which are necessary for contemporary employment practices. Previous studies have shown that students in different disciplines often exhibit distinct personality orientations. According to Succi & Canoyi (2019) and Kokkinos et al. (2024), by incorporating generic skills into teaching methods be able to enhance both subject knowledge and personal competencies. In addition, this approach will ensure that graduates from both STEM and Social Sciences & Humanities are not only academically proficient but also equipped with the adaptability, interpersonal competence, and problem-solving skills essential for thriving in the 21st-century workplace. Therefore, understanding how the Big Five Personality Traits influence the development of generic skills can help educators and employers design more effective learning and development strategies that align with individuals' personality profiles. This approach can significantly enhance workforce readiness and improve employability, particularly for Generation Z, who are entering a technologically advanced and rapidly evolving job market.

Methods

A quantitative research method was selected for this research to examine the relationship between Big Five Personality Traits and the development of generic skills based on UTM graduate attribute elements. Descriptive research was employed by collecting and analysing data from a targeted group of respondents, specifically final-year undergraduate students at UTM. Table 3 presents the population and sample size of UTM's final-year undergraduate (UG) students, categorized into two major groups based on different education disciplines.

Table 3 Population and Recommended Sampling Size of UTM's Final Year UG Students

Education Disciplines	Population (N) of UTM's Final Year UG	Recommended Sampling Size (n)
Science, Technology, Engineering & Mathematics (STEM)	1342	299
Social Sciences, Arts & Humanities	467	212

The questionnaires were distributed using online Google Forms, as it is an efficient and accessible method for reaching respondents. This online platform allows for quick dissemination, easy response tracking, and convenient data

collection. This approach is particularly effective for engaging university students, who typically possess proficiency with digital tools and have reliable internet access, thereby facilitating convenient and timely participation.

All data collected were analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics, reliability tests (Cronbach's Alpha), Pearson correlation analysis, and independent samples t-tests were performed to examine the relationships between the Big Five Personality Traits and UTM Attribute Generic Skills, as well as to identify any significant differences based on education discipline among final-year UG students at UTM.

Data Analysis and Results

Prior to distributing the survey, a pilot test was conducted with 15 final-year UG students from UTM. The purpose of this pilot test was to assess the validity and reliability of the questionnaire used in the research. Although the questionnaire had been previously used in earlier research, it was still necessary to conduct a pilot test to ensure its suitability and effectiveness for the current target group before distribution to the actual respondents. Table 4 shows results from the pilot test.

Table 4 Results of Pilot Test

Items	Number of Items	Alpha Cronbach	Reliability
Openness to experience (*O*)	3	0.669	Satisfactory
Conscientiousness (*C*)	4	0.781	Acceptable
Extraversion (*E*)	4	0.802	Good
Agreeableness (*A*)	4	0.691	Satisfactory
Neuroticism (*N*)	4	0.870	Good
UTM Attribute Generic Skills	7	0.707	Acceptable

Based on Table 4, the findings indicate that the data were both valid and reliable, as all six dimensions recorded Cronbach's Alpha values above 0.6. Specifically, extraversion, neuroticism, and generic skills demonstrated good reliability, each with a Cronbach's Alpha of 0.8. Openness to experience and agreeableness showed satisfactory reliability, with Alpha values of 0.6. Meanwhile, conscientiousness achieved an acceptable reliability level, with a Cronbach's Alpha of 0.7.

In this research, a set of questionnaires was distributed to randomly selected final-year students at UTM. The questionnaire was administered online via Google Forms and consisted of three sections as shown in Table 5. Section A focused on the respondents' demographic information and included nominal-type questions. Section B measured the Big Five Personality Traits, while Section C assessed Generic Skills. Both Sections B and C used a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). A total of 167 completed responses were successfully collected. Table 6 presents the demographic profile of the respondents involved in the research.

Table 5 Division of Item in The Questionnaire

Section	Items	Type of Questions
A	Respondent's Demographic Profile	Nominal / Categorical scale
B	The Big 5 Personality Trait	5 Likert scale
C	UTM Attribute Generic Skills	5 Likert scale

Table 6 Frequency and Percentage of Respondents' Demographic Characteristics

Demographic Profiles		Frequency (N=167)	Percentage (%)
Gender	Male students	51	30.5
	Female students	116	69.5
Age	< 20 years	5	3.0
	20 years-23years	146	87.4
	> 23 years	16	9.6
Education Discipline	STEM	63	62.3
	Social Sciences, Arts & Humanities	104	37.7
Race	Malay	108	64.7
	Chinese	36	21.6
	Indian	11	6.6
	Others	12	7.1

An independent t-test was conducted to determine whether there were any significant differences in the Big Five Personality Traits between final-year students from STEM and those from Social Sciences, Arts & Humanities at UTM. As shown in Table 7, the analysis revealed no significant difference between the two groups, with a p-value of 0.711 (Sig. 2-tailed), which is greater than the significance level of $\alpha = 0.05$.

Table 7 Frequency and Percentage of Respondents' Demographic Characteristics

BIG 5 PERSONALITY TRAITS	Test statistics (grouping variable: Education Discipline)				
	F	Sig.	T	df	Sig. (2 tailed)
Openness to experience (*O*)	0.264	0.608	-0.653	165	0.515
Conscientiousness (*C*)	2.909	0.90	-0.90	165	0.929
Extraversion (*E*)	0.425	0.515	1.543	165	0.125
Agreeableness (*A*)	0.100	0.752	-0.675	165	0.501
Neuroticism (*N*)	3.085	0.081	-0.143	165	0.887
Analysis on the Differences in Big Five Personality Traits Among Final-Year UTM Students Across Two Academic Disciplines	0.945	0.332	0.371	165	0.711

**Significant value p<0.05*

An independent t-test was conducted to examine the differences in Generic Skills between final-year students from STEM and those from Social Sciences, Arts & Humanities at UTM. As shown in Table 8, the Levene's Test for Equality of Variances produced a p-value of 0.545, which is greater than the significance level of $\alpha = 0.05$. This indicates that the assumption of equal variances is met. Furthermore, the independent sample t-test result shows a p-value (Sig. 2-tailed) of 0.444, which is also greater than 0.05. This means there is no statistically significant difference in the mean scores of Generic Skills between the two groups. Therefore, it can be concluded that final-year students from both Social Sciences, Arts & Humanities and STEM at UTM possess comparable levels of Generic Skills.

Table 8 Differences in Generic Skills between final-year UG students from STEM and those from Social Sciences, Arts & Humanities at UTM

	Education Discipline	Mean	Std. Deviation	F	Sig	T	df	Sig. (2tailed)
UTM Attribute Generic Skills	STEM	26.94	4.158	0.368	0.545	-0.767	165	0.444
	Social Sciences, Arts & Humanities	27.45	4.240					

The strength and relationship between the independent variable (Big Five Personality Traits) and the dependent variable (Generic Skills) were examined using Pearson Correlation analysis. The results indicate that all dimensions of the Big Five Personality Traits are positively correlated with Generic Skills, with each dimension showing a correlation coefficient (r) of 0.01. The overall correlation between the Big Five Personality Traits and Generic Skills is moderately strong, with a combined correlation value of r = 0.598. Table 9 presents the correlation analysis between the Big Five Personality Traits and Generic Skills.

Table 9 Correlation Analysis Between the Big Five Personality Traits and UTM Attribute Generic Skills

Big 5 Personality Traits	UTM Attribute Generic Skills		Relationship Strength Level	Interpretation
	Pearson Correlations (r)	Significant (2-tailed) p		
Openness to experience (*O*)	0.447**	0.000	**Moderate positive** (Significant)	Openness supports generic skill development.
Conscientiousness (*C*)	0.373**	0.000	**Weak positive** (Significant)	Slight positive link with generic skills.
Extraversion (*E*)	0.517**	0.000	**Moderate positive** (Significant)	Higher extraversion is moderately linked to

				stronger generic skills.
Agreeableness (*A*)	0.501**	0.000	**Moderate positive** (Significant)	Students who are more agreeable tend to have stronger generic skills.
Neuroticism (*N*)	0.095	0.221	Very weak positive (Not Significant)	No meaningful relationship with generic skills.
N= 167				

Based on Table 9, it shows that most of the Big Five traits particularly extraversion (0.517), Agreeableness (0.501) and openness to experience (0.447) are positively and significantly associated with generic skills. Neuroticism, however, does not have a significant impact in this context.

Discussions

The findings of this research indicate that there were no significant differences in the Big Five Personality Traits between Social Sciences, Arts & Humanities and STEM final-year students at UTM, with the overall analysis showing a p-value of 0.711 (Sig. 2-tailed), which is above the significance threshold ($\alpha < 0.05$). These results are consistent with the findings of Larson et al., (2007), who also reported no significant personality trait differences across academic majors. However, this finding contrasts with studies by Sánchez-Ruiz, Mavroveli and Poullis (2013) and Jones et al. (2023), which identified significant differences in personality traits across academic disciplines. For instance, Jones et al. (2023) found notable differences in agreeableness and neuroticism among students majoring in business, education, religion, and psychology. The discrepancy in findings could be attributed to several factors. One possible reason is the cultural and educational context, as this Malaysian public university setting may differ from Western contexts in academic structure, student diversity, and attitudes toward education. According to McCrae and Terracciano (2005), cultural factors can influence how personality traits are expressed and measured across populations. Another possible explanation is the sample composition and size. This research focused exclusively on final-year undergraduate students, who may be more academically and personally mature, resulting in less variation in personality traits across disciplines. Institutional structures, including structured curricula, collaborative learning environments, and mentoring, provide support that buffers the potential negative effects of neuroticism, enabling students to perform effectively in tasks requiring teamwork, communication, and problem-solving (Tett & Burnett, 2003; Holman & Tett, 2021). Furthermore, Trait Activation Theory posits that personality traits manifest in behavior only when relevant situational cues are present; since generic skill tasks are often structured, low-stress, and cooperative, the situational cues necessary to activate neuroticism are typically absent, limiting its observable impact on skill performance (Tett et al., 2021). Lastly, all education programmes in Malaysia are guided by the Malaysian Qualifications Framework (MQF), which requires all HEIs to cultivate a common set of learning outcomes including communication, problem-solving, teamwork, leadership, and lifelong learning irrespective of field of study. This means that students across both STEM and Social Science programmes are systematically exposed to comparable learning opportunities and assessment practices designed to foster these generic skills. Additionally, the disciplinary grouping used in this research (e.g., STEM vs. Social Sciences, Arts & Humanities) is relatively broad compared to the more specific major-based classifications used in previous research, which may have diluted any significant differences in personality traits.

This research found no significant differences in UTM Attribute Generic Skills between final-year UG students from Social Sciences, Arts & Humanities, and STEM disciplines at UTM, with the p-value (Sig. 2-tailed) recorded at 0.444 and well above the alpha level of 0.05. This indicates that students from both academic streams possess comparable levels of Generic Skills. Similarly, research by Lohberger and Braun (2022) examined learning opportunities in ten areas of generic skills, such as ICT, planning, and autonomy. Students from different academic disciplines such as humanities/arts, STEM, and economics were grouped into three learning profiles. Interestingly, across all fields of research, students consistently rated their skills in ICT, planning and organizing, and working independently on challenging tasks as the highest. This suggests that a student's academic discipline does not significantly affect the development of these generic skills. The research highlights the importance of viewing generic skills as a shared set of abilities rather than separating them by academic background. However, this finding contrasts with previous research by Badcock, Pattison, and Harris (2010), who reported significant differences in Generic Skills across academic majors. Their research suggested that different academic disciplines tend to emphasize specific skill sets such as communication and teamwork in the social sciences and analytical and technical skills in science and engineering, in which may lead to variations in the development of generic competencies. In the same vein, research by Hyytinen, Tuononen, and Haarala-Muhonen (2024) found that although the overall acquisition of generic skills appeared similar

across disciplines, there were notable differences in the development of specific skills such as critical thinking and communication. For example, law undergraduates demonstrated weaker performance in written communication compared to their peers in the social sciences. One possible reason for this discrepancy is the institutional approach at UTM, where Generic Skills are integrated and emphasized across all academic programs through structured curricular and co-curricular activities. This cross-disciplinary emphasis could contribute to a more uniform development of these skills, regardless of the students' academic major. According to Jackson (2012), when universities adopt institution-wide frameworks for employability skills, it can reduce skill disparities across faculties.

The Pearson Correlation analysis discovered that all dimensions of the Big Five Personality Traits are positively associated with UTM Attribute Generic Skills, with an overall correlation coefficient of $r = 0.598$, indicating a moderate positive relationship. Even though the result indicates a moderate relationship, they still suggest that students with stronger personality traits such as extraversion, conscientiousness, openness to experience, and agreeableness are more likely to exhibit higher levels of generic skills, including communication, teamwork, adaptability, and critical thinking. These findings are consistent with existing literature that links the influence of personality traits to employability-related skills. For example, Barrick and Mount (1991) found that conscientiousness and extraversion are strong predictors of job performance, which often depends on core generic competencies. Similarly, Chamorro-Premuzic and Furnham (2014) argued that traits like openness and agreeableness positively influence learning styles and interpersonal effectiveness, both of which contribute to skill development in academic and professional settings. The results also support the notion that personality plays a foundational role in shaping how students acquire and apply soft skills throughout their education (Kenayathulla, Ahmad and Idris, 2019). For instance, extraverted students may engage more confidently in group work and presentations, while conscientious individuals are more likely to be organized and responsible where traits that align closely with generic skill competencies. Current research conducted by Hu, Li and Song (2023) examined a total of 1,132 Chinese undergraduates to explore how personality influences key competencies like critical thinking, creativity, communication, and teamwork. The research found that personality traits not only directly affect a student's generic skills but also boost them indirectly by increasing psychological resources like confidence and resilience. For example, their findings revealed that students with high levels of openness and conscientiousness tend to be more creative and demonstrate stronger communication skills, whereas those with high levels of neuroticism are more likely to experience difficulties in critical thinking.

Conclusion

In general, findings of this research bring some significant implications for HEIs, educators, curriculum designers, and policy makers, predominantly in the context of contemporary management studies related to developing future talents for employability that requests the need to prepare graduates in order to meet demands of the modern workforce. The absence of significant differences in both the Big Five Personality Traits and UTM Attribute Generic Skills across academic disciplines namely, Social Sciences, Arts & Humanities, and STEM suggests that personality development and the acquisition of generic skills are not limited to or determined by students' academic disciplines. This highlights the role of the university's learning environment, culture, and teaching-learning approaches in influencing these critical attributes and generic skills. From an educational perspective, the results imply that efforts to develop students' generic skills and personality traits-related competencies can be implemented across all faculties. Since no academic discipline showed a clear advantage in these areas, it is important to integrate generic skills training and personal development programs into all undergraduate curricula. This includes embedding teamwork, communication, leadership, creativity, critical thinking elements into course activities, assessments, and co-curricular programs. By doing so, universities can ensure that students from all backgrounds are equally equipped with the skills and traits necessary for employment and lifelong learning.

Moreover, the moderate positive correlation ($r = 0.598$) between Big Five Personality Traits and UTM Attribute Generic Skills indicates that personality traits do play an initial role in determining how students acquire and apply generic skills. This finding underscores the importance of viewing student development holistically recognizing that traits like conscientiousness, openness, and extraversion contribute meaningfully to the development of communication, critical thinking, and other employability-related skills. As such, personality assessments and developmental interventions (e.g., reflective practices, mentoring, peer coaching) can be useful tools in identifying students' strengths and addressing areas for improvement. On a broader level, these findings support national and institutional efforts, such as those advocated by TalentCorp and the Ministry of Higher Education Malaysia, to produce graduates who are not only academically proficient but also emotionally intelligent, adaptable, and well-rounded. The results reinforce the relevance of the UTM Graduate Attributes as a guiding framework for preparing students to meet

both current and future workforce demands. For policy makers, these results suggest the need for a unified strategy that emphasizes transferable skills and character development across all academic programs, not just those in traditionally skill-intensive disciplines like engineering or business. Support should also be given to training educators in generic skill facilitation, adopting active learning strategies, and incorporating personality development into course design.

While this study provides meaningful insights, future research could expand the sample to include students from other local and foreign universities for comparative analysis. Researchers may also consider integrating qualitative methods such as interviews or focus groups to capture deeper insights into how undergraduate students perceive the development of generic skills throughout their studies in university. Lastly, future research could also explore the role of external factors such as internships, extracurricular involvement, and digital learning environments in shaping both personality and generic skills development. In conclusion, the implications of this study emphasized on the importance of acknowledging individual differences particularly by looking at personality traits among undergraduate students in HEIs level and how the traits might influence the generic skills development. All student, regardless of academic background, should be given equal opportunities to grow as competent, confident, and employable individuals who can thrive in an increasingly dynamic and complex world.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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