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# Valuing Skills for the Future: Exploring High School Students' Perceptions and Competencies in Technical and Vocational Education and Training Program

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## Abstract

The primary purpose of this study was to explore how students' knowledge, skills, and attitudes (KSA) toward Technical and Vocational Education and Training (TVET) influence their acceptance of it, while also measuring the levels of KSA and TVET acceptance among students. The research aimed to answer key questions regarding the levels of acceptance, knowledge, skills, and attitudes, and to investigate the correlations between these variables. A quantitative methodology was employed, involving a survey of 377 senior high school students from 13 schools in Yuhua District, China. The data were analyzed using descriptive and inferential statistical methods to assess levels and relationships. The findings revealed that a significant number of students demonstrated positive attitudes and high levels of KSA, yet the correlation between KSA and acceptance was relatively weak. Notably, while all three components knowledge, skills, and attitudes showed a positive relationship with TVET acceptance, knowledge and attitudes had only a slight influence. Skills, however, exhibited a moderately low impact on students' acceptance of TVET. Students with stronger practical skills and more favorable attitudes toward TVET were more likely to express interest and a willingness to participate in TVET courses compared to other factors. These findings propose the importance of emulating a supportive learning environment that balances both the theoretical and practical dimensions of TVET, ensuring students are better equipped to engage with and appreciate the value of vocational education.

## Keywords

Knowledge, Skill, Attitude, Technical and Vocational Education and Training (TVET)

## 1. Introduction

Technical and Vocational Education and Training (TVET) is a crucial pathway for bridging skills gaps and fostering economic growth, particularly in developing countries (UNESCO-UNEVOC, 2021). Despite its potential, student acceptance of TVET, defined in this study as students' willingness to enroll in TVET programs, recommend them to others, and perceive them as valuable for career development—remains inconsistent (Makibinyane, 2020; Mutungi, 2023; Mwinkume et al., 2024). Research highlights that knowledge, skills, and attitudes (KSA) significantly shape students' educational choices (Cairns & Malloch, 2017; Mulder, 2017); however, few studies specifically explore how these elements affect TVET acceptance among senior high school students. Despite its potential, student acceptance of TVET remains inconsistent, which negatively impacts enrollment rates and influences perceptions of its value for career development (Makibinyane, 2020; Mutungi, 2023; Mwinkume et al., 2024). Research highlights that knowledge, skills, and attitudes (KSA) significantly shape students' educational choices (Cairns & Malloch, 2017; Mulder, 2017); however, few studies specifically explore how these elements affect the acceptance of TVET among senior high school students.

Knowledge of TVET's relevance and value has been shown to be a key determinant in students' educational preferences (Omar et al., 2020b; Shaari et al., 2024). Misunderstandings about TVET as a less prestigious option compared to traditional academic tracks often discourage students from considering this career-oriented path (Rehman et al., 2024). Limited awareness of TVET's alignment with industry demands further reduces students' willingness to explore it as a viable option (Adams, 2019; Nordin & Omar, 2024). This highlights the importance of examining how students' knowledge or lack thereof about TVET's career pathways affects their acceptance. Such insights can guide the development of educational initiatives to raise awareness about TVET's benefits within secondary education.

Skill acquisition is another critical factor in shaping students' views on TVET. Studies indicate that students who perceive TVET as a means to gain practical, market-relevant skills are more inclined to see it as a viable educational pathway (Allais & Marock, 2023; Gyimah, 2020; Methembu, 2022). The prospect of obtaining employable skills is often a major motivation for students interested in TVET (Okolie et al., 2020). Thus, assessing whether students believe TVET can provide the skills needed for future employment especially in high-demand fields will be essential in understanding how they evaluate its potential benefits.

Attitudes toward TVET, shaped by cultural, familial, and societal factors, also play a vital role in determining students' acceptance of this pathway (Gaffoor & Van der Bijl, 2019; Shaari et al., 2024). In many regions, negative attitudes toward TVET persist due to a strong preference for academic pathways and the social stigma often associated with vocational training (Kapolo, 2023). Recognizing and addressing these specific attitudinal barriers can provide valuable insights into

students' decision-making processes. Promoting a more positive perception of TVET as a respected educational and career path is essential to overcoming these barriers.

Gaining a deeper understanding of the relationship between knowledge, skills, attitudes, and TVET acceptance among high school students is vital for shaping educational policies and programs. By examining these factors in the Yuhua District, this study seeks to provide insights into how TVET can be better promoted among general high school students, potentially increasing enrollment and aligning educational pathways with both local and national labor market needs (International Labour Organization, 2021). Identifying these relationships can assist educators and policymakers in designing effective interventions that nurture positive perceptions of TVET, thereby contributing to a more skilled and adaptable workforce.

**Issues Pertaining to TVET Acceptance**

Research indicates that students' knowledge of TVET programs, career pathways, and potential benefits significantly impacts their acceptance of TVET as a viable educational choice (Omar et al., 2020a; Haji, 2023; Mutungi, 2023). Additionally, students' perceived skills and competencies relative to TVET requirements play a key role. Students who believe they possess, or can develop, the necessary skills are more likely to view TVET favorably and consider it a suitable path (Okolie, 2020; Omar et al., 2020a).

Moreover, students' attitudes toward TVET, shaped by societal perceptions, parental influence, and peer pressure, significantly influence their willingness to pursue this pathway (Ayanwale et al., 2023; Esau, 2018; Shaari et al., 2024). The interplay of knowledge, skills, and attitudes (KSA) is complex. For instance, a student's positive attitude toward TVET can be reinforced by their knowledge of potential career prospects and confidence in their skills. Conversely, a lack of information or a perceived mismatch between skills and program demands can foster negative attitudes and reduce acceptance (Abd Hamid et al., 2023; Taweel, 2018).

Understanding these KSA dynamics is essential for developing effective strategies to promote TVET acceptance. Cultural factors, such as societal views on vocational education and traditional career aspirations, can strongly influence KSA and, by extension, TVET acceptance (Buli & Yesuf, 2015). In some cultures, TVET is viewed as inferior to academic pathways, leading to negative perceptions and lower acceptance rates. Socioeconomic factors, including family income and educational background, can also shape students' access to information and resources related to TVET, ultimately influencing their KSA and acceptance levels (Amro, 2022; Kapolo, 2023).

In China, research by Shen Youlu (2022) suggests that TVET acceptance remains low among senior high school students, with demand for vocational education from these students under 10% in some areas and, at most, around 25% to 30%. For instance, a 2011 survey of 2773 senior high school students in Henan Province revealed that only 9.93% were interested in vocational college enroll-

ment (Song, 2013). Similarly, a 2014 survey of 3,235 students in S City, Hunan Province, showed that 25.3% were willing to consider vocational colleges (Chen & Shen, 2018). Earlier data indicate a slightly higher interest in rural areas, with 34.2% of recent graduates from Hebei Province townships showing willingness to attend vocational colleges (Shen, 2022).

Despite some improvements in TVET attractiveness over the past decade, obstacles remain. Research by Chen and Qian (2018) indicates that most parents and students remain reluctant to embrace vocational education. Data show that TVET enrollment increased until 2010, after which it declined sharply, suggesting a gradual weakening in TVET's perceived value and acceptance.

These findings depict the need for targeted strategies to boost TVET acceptance among senior high school students. Such strategies should prioritize enhancing students' knowledge of TVET through career guidance and awareness programs. Furthermore, fostering positive attitudes toward TVET by challenging stereotypes and highlighting the value of vocational skills is crucial. Addressing cultural and socioeconomic disparities in access to TVET information and opportunities is also essential to promote equitable acceptance. By understanding and addressing the complex interplay of KSA factors, cultural norms, and socioeconomic conditions, policymakers and educators can create interventions that ensure all students have access to quality vocational education and training opportunities.

This study was conducted with the following objectives: 1) to assess the levels of knowledge, skills, and attitudes (KSA) as well as the acceptance of TVET among high school students in Yuhua District, Changsha City, Hunan; and 2) to examine the relationship between students' KSA and their acceptance of TVET education.

## 2. Methodology

A quantitative research approach with a correlational design was used, selecting students from 13 high schools in Yuhua District, Changsha City, Hunan Province. The study's population size was 19,800, with a target sample of 377, calculated at a 95% confidence level and a 5% margin of error. To obtain comprehensive information on high school students' knowledge, skills, attitudes (KSA) in technical and vocational education, as well as their acceptance of it, students from all three senior high school years—first, second, and third—were included.

***Sampling Procedure***

A stratified random sampling method was applied. Within each of the 13 schools, students were stratified by grade level (first, second, third year). From each stratum, students were randomly selected using a computer-generated random number list. The target was to select approximately 29 students per school: 10 first-year, 10 second-year, and 9 third-year students. A total of 400 students were invited to participate. Completed and valid questionnaires were returned by 377 students, yielding a response rate of 94.25%. **Table 1** describes the tabulation of the population of the study and **Figure 1** illustrates the location of the study.

Table 1. Information on 13 high schools in Yuhua district.

| No. | The name of schools | The number of students |
|---|---|---|
| 1 | Yali Middle School of Changsha | 1320 |
| 2 | Nanya Middle School of Changsha | 1470 |
| 3 | NO.11 Middle School of Changsha | 1500 |
| 4 | NO.15 Middle School of Changsha | 1750 |
| 5 | No.21 Middle School of Changsha | 1440 |
| 6 | Changsha Foreign Languages School | 1700 |
| 7 | The High School Attach to Hunan Normal University-Yuhua School | 1420 |
| 8 | Mingde Yuhua Experimental Middle School | 1300 |
| 9 | Hunan Dizhi Middle School | 1900 |
| 10 | Hunan Changsha Tongsheng Lake Experimental School | 1500 |
| 11 | Daotian Middle School | 1600 |
| 12 | Hongyi senior high school of Changsha | 1800 |
| 13 | Yaohua Middle School of Changsha | 1100 |
| | | N = 19,800 |

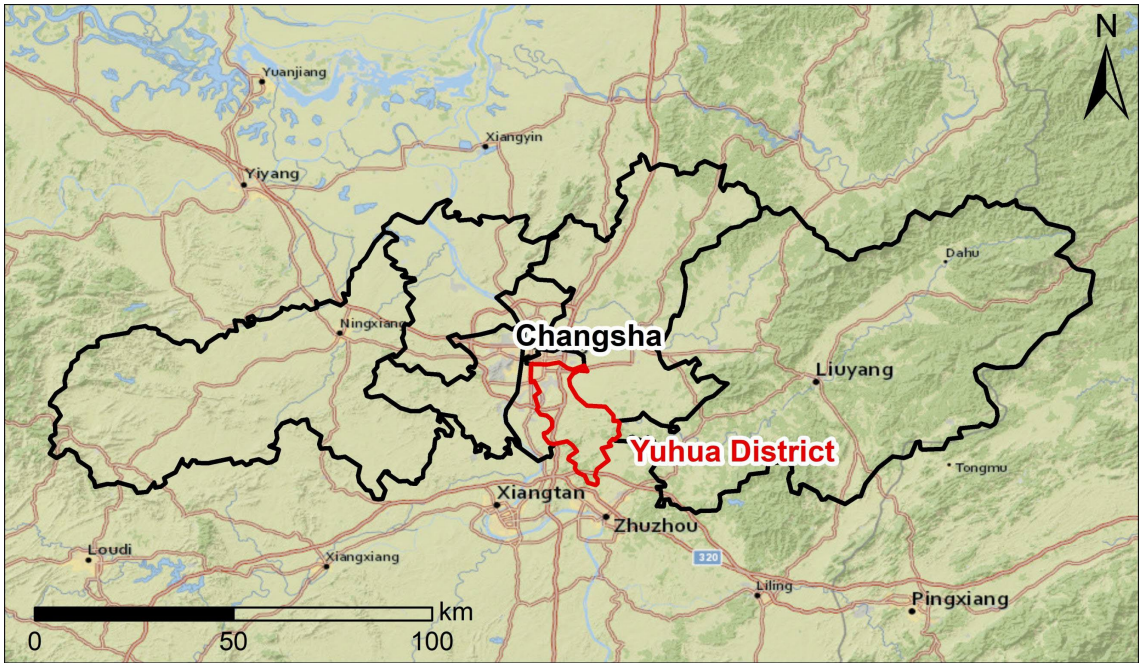


Figure 1. Changsha city map and Yuhua district map.

### *Instrumentation*

The questionnaire used in this study was adapted from those developed by Omar, Zahar, and Rashid (2020) and Rao and Jalil (2021), with modifications ac-

cording to the study's objectives and context. It was structured into four sections: (A) students' acceptance of TVET, (B) knowledge of TVET, (C) skills, and (D) attitudes toward TVET.

### *Ethics Statement*

This study was approved by the Ethics Committee of the Faculty of Educational Studies, Universiti Putra Malaysia. Permission was also obtained from the Yuhua District Education Bureau and the principals of all 13 participating schools. Because respondents were minors (senior high school students aged 15 - 18), written informed consent was obtained from parents or legal guardians prior to data collection. Additionally, written assent was obtained from each student after explaining the study's purpose, voluntary nature, and confidentiality protections. Students could withdraw at any time without consequence.

### *Data Analysis*

Data were entered and analyzed using SPSS version 29.0 to determine senior high school students' levels of knowledge, skills, attitudes, and acceptance toward TVET. Responses were interpreted based on a 5-point Likert scale. Section A, titled "Student Acceptance of TVET", includes 10 questions labeled A1 to A10. Section B, "TVET Knowledge of Students", consists of 10 questions labeled B1 to B10. Section C, "Skills", contains 10 questions labeled C1 to C10, and Section D, "Attitude Toward TVET", has 10 questions labeled D1 to D10. The study followed its intended methodology, collecting necessary data through a questionnaire. The Questionnaire Star tool, a Chinese equivalent of Google Forms, was used for data collection, with the responses then transferred to Microsoft Excel and SPSS for further analysis.

Responses for each variable were measured on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). For each respondent, a mean acceptance score was computed by summing responses to the 10 acceptance items (A1 - A10) and dividing by 10. The same procedure was followed for knowledge, skills, and attitudes. Based on the scale range (1.00 to 5.00), mean scores were categorized as: low (1.00 - 2.49), medium (2.50 - 3.49), and high (3.50 - 5.00). This categorization was applied to all variables, including the dependent variable (TVET acceptance). Prior to data collection, two experts reviewed the questionnaire for content validity. A pilot test with 37 students (10% of the sample) yielded a Cronbach's Alpha of 0.819 for 40 items, indicating high reliability.

## 3. Results and Findings

### *Demographic Profiles of Respondents*

As shown in Table 2, among the 377 randomly selected senior high school students from 13 schools in Yuhua District, approximately 43.5% were male and 56.5% were female. The students were categorized by grade level: first-year, second year, and third-year students. The largest groups were the first- and second-year students, each comprising about 34.48% of respondents, while third-year students represented approximately 31.03%.

Table 2. Frequency distribution on respondent's demographics characteristics.

| Demographic Profile | n (Number of Students) | Percentage (%) |
|---|---|---|
| Gender | | |
| Male | 164 | 43.50% |
| Female | 213 | 56.50% |
| Grade Level | | |
| The first-year student | 130 | 34.48% |
| The second-year student | 130 | 34.48% |
| The third-year student | 117 | 31.03% |

### *Descriptive Findings: Levels of KSA and TVET Acceptance*

Table 3. Composite means and standard deviations for KSA and TVET acceptance.

| Variable | Mean | SD | Level |
|---|---|---|---|
| **TVET Acceptance** | 3.72 | 0.68 | High |
| **Knowledge** | 3.68 | 0.72 | High |
| **Skills** | 3.55 | 0.74 | High |
| **Attitude** | 3.70 | 0.70 | High |

Note: N = 377. Possible range 1.00 - 5.00. High level = 3.50 - 5.00.

According to the data in Table 3, the composite means demonstrate that students generally maintain high levels of TVET acceptance, knowledge, skills, and attitudes. However, the standard deviations indicate a moderate level of dispersion, suggesting some variability in perspectives among the respondents.

### *Descriptive Findings* 1: *Knowledge Level*

Table 4 provides an overview and analysis of respondents' perceptions regarding their acquisition and mastery of TVET knowledge. Overall, most respondents expressed a positive inclination toward gaining and applying TVET knowledge through their courses. The percentages of "Strongly Agree" and "Agree" responses exceeded 25% across all questions, indicating that the majority found the courses beneficial in helping them understand both theoretical and practical aspects of TVET. For instance, 55.42% of respondents in item B4 believed they had gained sufficient TVET knowledge to apply it to assignments and practical tasks.

However, a noteworthy portion of students maintained a neutral stance. Each question reflected a significant share of "Neutral" responses, typically ranging from 19% to 21%, suggesting that about one-fifth of respondents were uncertain about the impact of their acquired TVET knowledge on career competence. This neutrality may reflect a sense of indecision regarding the effectiveness of TVET knowledge or a wait-and-see attitude about its practical application.

While negative attitudes were less prevalent, they remain a concern. Despite the

overall positive sentiment, a considerable 25% of respondents indicated negative perceptions through "Disagree" and "Strongly Disagree" responses. This suggests that a segment of students felt they had not adequately mastered practical knowledge or doubted the usefulness of the TVET knowledge they acquired in helping them succeed in real-world applications.

Table 5 reveals insights into respondents' willingness and interest in acquiring TVET knowledge, with the majority demonstrating a positive inclination. In each question, the combined percentages for "Strongly Agree" and "Agree" responses exceeded 52%, indicating that more than half of the students were open to receiving guidance from teachers and experts, sharing knowledge with peers, and learning new skills and techniques.

Table 4. Descriptive findings of respondents' gaining and mastering knowledge of TVET.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| B1 | I have gained a lot of knowledge about practical techniques or skills by participating in the TVET courses. | 99 (26.26%) | 99 (26.26%) | 82 (21.75%) | 50 (13.26%) | 47 (12.47%) |
| B2 | I have learnt many methods of collaborating and communicating effectively with my classmates through the TVET courses. | 104 (27.59%) | 102 (27.06%) | 75 (19.89%) | 49 (13%) | 47 (12.47%) |
| B4 | I think I have enough TVET knowledge that I can apply in my practical assignments and tasks. | 113 (29.97%) | 96 (25.46%) | 81 (21.49%) | 37 (9.81%) | 50 (13.26%) |
| B5 | I have enough knowledge to operate the equipment used in my practical courses. | 103 (27.32%) | 100 (26.53%) | 82 (21.75%) | 45 (11.94%) | 47 (12.47%) |

Table 5. Descriptive findings of respondents' willingness and interest in learning knowledge of TVET.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| B3 | I always seek advice from TVET teachers or experts to enhance my knowledge. | 101 (26.79%) | 96 (25.46%) | 82 (21.75%) | 52 (13.79%) | 46 (12.2%) |
| B6 | I am willing to share my TVET knowledge with my classmates. | 104 (27.59%) | 98 (25.99%) | 79 (20.95%) | 49 (13%) | 47 (12.47%) |
| B7 | I am interested in understanding or learning about existing and latest technologies. | 109 (28.91%) | 99 (26.26%) | 70 (18.57%) | 55 (14.59%) | 44 (11.67%) |
| B9 | I am willing to learn and follow the standards of various equipment in our practical courses. | 108 (28.65%) | 99 (26.26%) | 69 (18.3%) | 50 (13.26%) | 51 (13.53%) |
| B10 | I would like to use various practical learning strategies to enhance my understanding of TVET knowledge. | 106 (28.12%) | 96 (25.46%) | 73 (19.36%) | 49 (13%) | 53 (14.06%) |

However, certain questions specifically B3, B6, and B10 had close to 20% of

respondents selecting "Neutral". This may suggest hesitation or uncertainty among some students about engaging more actively in knowledge-sharing or acquiring new TVET skills, potentially indicating that their expectations of course content or their needs are not fully addressed. This neutral stance may also highlight gaps in students' theoretical or practical understanding that could benefit from further support.

Despite the overall positive attitude, a significant proportion of negative feedback remains, with over 25% expressing reluctance to engage fully. For instance, 26.79% of respondents in item B9 indicated an unwillingness to learn or adhere to standards, which could suggest that some students found the curriculum too challenging or felt that teaching strategies did not sufficiently motivate them to actively engage with standards.

Table 6 presents the distribution of respondents' expectations for external learning opportunities in TVET. Over half of the respondents (58.62% in "Strongly Agree" and "Agree" categories) expressed a desire for schools or teachers to organize industrial visits to enhance their understanding of TVET. This highlights a strong interest among students in expanding their knowledge through hands-on, real-world experiences.

However, a noteworthy 25.73% of respondents over a quarter indicated a negative attitude ("Disagree" and "Strongly Disagree") toward external learning opportunities. This may suggest that these students feel that the in-school resources are sufficient or that their interest in external learning is not as strong as their preference for school-based learning experiences.

Table 6. Descriptive findings of respondents' expectation of external learning on TVET.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| **B8** | I expect my school or teachers to lead us to visit some social institutions to increase my TVET knowledge. | 113 (29.97%) | 108 (28.65%) | 59 (15.65%) | 50 (13.26%) | 47 (12.47%) |

### *Descriptive Findings* 2: *Skill Level*

Table 7 reveals that while the majority of respondents selected "Strongly Agree" and "Agree" especially notable in question C4 (31.56% "Strongly Agree" and 24.4% "Agree") there remains a substantial portion, over one-fifth, who indicated a "Neutral" response, particularly for question C2. This higher-than-average neutrality suggests that some respondents are uncertain about how to effectively apply their practical knowledge to assignments or lack confidence in their abilities.

Additionally, the proportion of respondents with a negative tendency ("Strongly Disagree" and "Disagree") is similar across all items, with both categories near 30%. This may indicate that TVET courses are not adequately guiding students on applying practical knowledge to real tasks or that the methods taught

are perceived as overly complex, making it challenging for students to use them successfully.

The data presented in Table 8 highlights that a significant proportion of respondents, approximately 25%, selected "Strongly Agree" or "Agree" regarding their ability to use learning strategies and creativity to complete tasks. This suggests that many students are uncertain about their skills in applying these strategies or creative thinking, possibly lacking confidence in their own abilities.

Although the proportion of positive responses ("Strongly Agree" and "Agree") ranges between 47% and 50%, this still leaves over 30% of respondents who combinedly indicated less confidence. More than a quarter of students either hesitate to apply learning strategies or creative thinking in practical or TVET courses, or they may have lost confidence due to the challenges they face when trying to implement these strategies effectively.

Table 7. Descriptive findings of respondents applying TVET skills in practice.

| No. | Skill Question | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| C2 | I am able to apply practical knowledge effectively in my practical assignments or tasks. | 91 (24.14%) | 84 (22.28%) | 80 (21.22%) | 56 (14.85%) | 66 (17.51%) |
| C4 | I have skills that enable me to make good use of the equipment in the practical classroom such as the baking machine. | 119 (31.56%) | 92 (24.4%) | 50 (13.26%) | 57 (15.12%) | 59 (15.65%) |
| C5 | I have skills to apply safety practices in our practical courses. | 93 (24.67%) | 104 (27.59%) | 64 (16.98%) | 58 (15.38%) | 58 (15.38%) |

Table 8. Descriptive findings of respondents applying strategy or creativity skill in their practice.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| C3 | I am able to use various learning strategies to understand the practical content better. | 94 (24.93%) | 85 (22.55%) | 78 (20.69%) | 49 (13%) | 71 (18.83%) |
| C6 | I always try to be more creative or diverse to finish practical assignments. | 91 (24.14%) | 100 (26.53%) | 74 (19.63%) | 58 (15.38%) | 54 (14.32%) |

Table 9 presents the distribution of respondents' interest and willingness to enhance their practical skills. Overall, the data shows a balanced spread of responses across the various categories—"Strongly Agree", "Agree", "Neutral", "Disagree", and "Strongly Disagree". A majority of respondents demonstrated a positive attitude towards improving their skills, with the distribution of positive responses ranging from 47% to 52%.

Notably, the percentage of "Neutral" responses in item C7 (I am always ready and eager to improve my skills) stands out, as it deviates from the distribution in other questions. At 23.08%, it is the second-highest response, just 1% lower than

the "Agree" category. This suggests that more students are neutral about their eagerness to improve their skills compared to those who expressed a strong or moderate positive stance. This could indicate that some students' willingness to enhance their skills is unclear or constrained by practical factors, such as time or resources, leading to a limited commitment to skill development.

The data presented in Table 10 reflects respondents' concern for the needs of others and society. Overall, most respondents expressed positive or neutral views regarding the importance of improving their skills to meet societal needs and assisting their classmates. The higher proportions of "Strongly Agree" and "Agree" responses indicate that most students are willing to contribute to society and help their peers.

Table 9. Demographic findings of respondents' interest in practical skills and willingness to improve them.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| C1 | I have skills and competence in the field that I am very interested. | 97 (25.73%) | 94 (24.93%) | 67 (17.77%) | 59 (15.65%) | 60 (15.92%) |
| C7 | I am always ready and eager to improve my skills. | 86 (22.81%) | 93 (24.67%) | 87 (23.08%) | 53 (14.06%) | 58 (15.38%) |
| C10 | I am confident in gaining and improving new practical skills through the TVET courses. | 97 (25.73%) | 97 (25.73%) | 73 (19.36%) | 59 (15.65%) | 51 (13.53%) |

Table 10. Descriptive findings of respondents' concern for the needs of others and society in practice.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| C8 | I always focus on the vocational needs of the society and try to improve my skills. | 117 (31.08%) | 82 (21.75%) | 74 (19.63%) | 54 (14.32%) | 50 (13.26%) |
| C9 | I am good at helping my classmates to understand the learning content related to practical skills. | 98 (25.99%) | 90 (23.87%) | 79 (20.95%) | 50 (13.26%) | 60 (15.92%) |

However, in the responses to C9 ("I am good at helping my classmates understand the learning content related to practical skills"), the "Neutral" option stands at nearly 21% (20.95%), which is higher than the "Neutral" response in C8. This suggests that a significant number of students are uncertain or neutral about their ability to assist others with learning content related to practical skills, possibly indicating a lack of confidence or willingness to help their peers.

***Descriptive Findings* 3: *Attitude Towards TVET***

The data distribution in Table 11 highlights respondents' attitudes toward TVET courses, revealing that the majority hold a positive perspective. A relatively even split between the "Strongly Agree" and "Agree" responses both representing the highest percentages followed by the "Neutral" option, suggests that some respondents maintain moderate views rather than extreme opinions about the courses.

This distribution indicates that while students' attitudes toward TVET courses

are not overwhelmingly negative, they are not entirely enthusiastic either, leaning toward a more conservative stance. A notable portion of respondents exhibit neutral attitudes toward TVET tasks and assignments, which may suggest a lack of awareness about the significance of these tasks or their role in developing essential skills and competencies.

Table 11. Descriptive findings of respondents' attitudes towards TVET course.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| D1 | I have always been positive about school's TVET courses. | 96 (25.46%) | 92 (24.4%) | 78 (20.69%) | 46 (12.2%) | 65 (19.24%) |
| D3 | Whenever I am in a TVET course or a practical learning activity, I am very willing to follow the class discipline so that I can learn effectively. | 92 (24.4%) | 105 (27.85%) | 66 (17.51%) | 54 (14.32%) | 60 (15.92%) |
| D9 | I am willing to take my tasks and assignments seriously and responsibly. | 90 (23.87%) | 86 (22.81%) | 81 (21.49%) | 51 (13.52%) | 69 (18.3%) |

Table 12. Descriptive findings of respondents' attitudes towards practical activities in TVET course.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| D4 | I always willing to spend some time to check the equipment can work well before I use it in the practical course. | 92 (24.4%) | 86 (22.81%) | 78 (20.69%) | 54 (14.32%) | 67 (17.77%) |
| D7 | I am always willing to follow safety practices in the practical course. | 96 (25.46%) | 97 (25.73%) | 66 (17.51%) | 59 (15.65%) | 59 (15.65%) |

The data distribution in Table 12 highlights respondents' generally positive attitudes toward equipment inspections and adherence to safety practices during practical courses. For questions D4 and D7, a significant percentage of respondents selected "Strongly Agree" and "Agree", particularly in D7, where both categories accounted for 25.46%. This suggests that many respondents place a high value on safety norms and exhibit a strong sense of responsibility in this area.

However, the data also reveals that 20.69% and 17.51% of respondents chose "Neutral" for D4 and D7, respectively, indicating a more reserved or uncertain stance toward equipment inspections and safety practices. Additionally, the proportion of respondents selecting "Strongly Disagree" for D4 (17.77%) is slightly higher than for D7, which may reflect a comparatively lower level of concern for equipment inspections than for adhering to safety regulations.

The data distribution in Table 13 indicates that respondents generally hold positive attitudes toward the TVET ecosystem, as reflected by the high percentages of those selecting "Strongly Agree" and "Agree". Notably, for question D5, 27.59% of respondents selected "Strongly Agree", a figure significantly higher than the 20.95% who chose "Agree". This suggests that many respondents are interested in

improving their personal skills and actively engaging in practical learning.

Table 13. Descriptive findings of respondents' attitudes towards TVET ecosystem.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| D5 | I am willing to join an additional TVET course to improve my abilities. | 104 (27.59%) | 79 (20.95%) | 70 (18.57%) | 60 (17.92%) | 64 (16.98%) |
| D6 | I am always eager to participate in practical-based learning environments. | 98 (25.99%) | 76 (20.16%) | 79 (20.95%) | 63 (16.71%) | 61 (16.18%) |

However, it is noteworthy that 20.95% of respondents selected "Neutral" for question D6, representing the second-highest percentage. This may indicate caution among some respondents when participating in practical learning environments, potentially influenced by prior experiences or practical constraints.

Additionally, a portion of respondents expressed negative attitudes, with approximately 16% selecting "Strongly Disagree" or "Disagree" for D5. This may reflect a lack of interest in additional TVET courses, possibly due to factors such as time constraints, financial considerations, or other personal circumstances.

The data analyzed in Table 14 reveals that, overall, respondents displayed relatively positive attitudes toward their learning processes in TVET. For options D8 and D10, a significant proportion of respondents selected "Strongly Agree" and "Agree", reflecting the importance they place on enhancing their learning and practical abilities through TVET.

Table 14. Descriptive findings of respondents' attitudes towards learning process in TVET.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| D8 | I always willing to make sure I understand the task objective before starting the practical tasks or assignments. | 102 (27.06%) | 84 (22.28%) | 77 (20.42%) | 65 (17.24%) | 49 (13%) |
| D10 | I always try to distribute theoretical learning and practical time in TVET courses wisely. | 98 (25.99%) | 87 (23.08%) | 75 (19.89%) | 61 (16.18%) | 56 (14.85%) |

However, it is noteworthy that 20.42% of respondents chose "Neutral" for D8. This suggests that one-fifth of the participants were uncertain about their ability to comprehend assigned tasks. This uncertainty could stem from the complexity of certain assignments or tasks presented in TVET courses, which may pose challenges for some learners.

The data in Table 15 indicates that respondents generally hold a positive attitude toward the future development of TVET. A significant proportion selected "Strongly Agree" (25.2%) and "Agree" (26.79%), reflecting their confidence in the potential progress of TVET.

However, it is notable that 29.44% of respondents chose "Strongly Disagree" or "Disagree," representing over a quarter of the participants. This suggests that

some individuals have doubts about the prospects of TVET, potentially due to varying levels of understanding regarding its developmental direction and associated policies.

Table 15. Descriptive findings of respondents' attitudes towards future development in TVET.

| No. | Item | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| D2 | I hold the positive attitude about the future development of TVET in China. | 95 (25.2%) | 101 (26.79%) | 70 (18.57%) | 52 (13.79%) | 59 (15.65%) |

### *Inferential Analysis* 1: *Relationship Between Demographic Findings and TVET Acceptance*

Table 16 presents the correlation between demographic factors and the respondents' level of acceptance toward TVET. The analysis focuses on gender and grade level, revealing that while both factors were significantly correlated with acceptance, only one demonstrated a strong relationship.

The data indicates a significant relationship between gender and acceptance of TVET. Among male respondents, 56.8% (n = 100) exhibited high acceptance, compared to 49.3% (n = 99) among females. A slightly higher proportion of females displayed lower acceptance compared to males. A Chi-Square test of independence confirmed the significant relationship between gender and acceptance, with a significance level of 0.05, $\chi^2$ (1, N = 377) = 4.151, $p$ = 0.042, and a high strength of association (Cramer's V = 0.57).

Regarding grade level, second-year students showed the highest acceptance of TVET, with 60.8% (n = 79) reporting high acceptance. In contrast, third-year students exhibited the lowest acceptance at 47.9% (n = 56), while first-year students recorded 49.2% (n = 64). The Chi-Square test also indicated a significant relationship between grade level and acceptance, $\chi^2$ (2, N = 377) = 18.327, $p < 0.001$. However, the strength of this relationship was negligible (Cramer's V = 0.118).

Table 16. Result of chi-square analysis.

| Variable | High Acceptance n (%) | Low Acceptance n (%) | $\chi^2$ | $p$ | Cramer's V |
|---|---|---|---|---|---|
| **Gender** | | | 4.151 | 0.042 | 0.105 |
| Male | 100 (56.8%) | 76 (43.2%) | | | |
| Female | 99 (49.3%) | 102 (50.7%) | | | |
| **Grade** | | | 18.327 | <0.001 | 0.118 |
| First year | 64 (49.2%) | 66 (50.8%) | | | |
| Second year | 79 (60.8%) | 51 (39.2%) | | | |
| Third year | 56 (47.9%) | 61 (52.1%) | | | |

With $\chi^2$ (1, N = 377) = 4.151, Cramer's $V = \sqrt{(4.151/377)} = \sqrt{0.011} = 0.105$,

indicating a small (not high) association between gender and TVET acceptance.

***Inferential Analysis 2: Relationship Between Knowledge, Skill, and Attitudes and TVET Acceptance***

The results of the Pearson correlation analysis in Table 17 indicate the relationships between the TVET acceptance (dependent variable) and three independent variables: knowledge, skills, and attitude toward TVET.

The Pearson correlation coefficient (r) between the acceptance level of TVET and the knowledge level of TVET is 0.194, indicating a low positive correlation. This suggests that as senior high school students' knowledge about TVET increases, their acceptance of TVET also increases, albeit slightly.

Similarly, the correlation between the acceptance level of TVET and the skill level of TVET is 0.266, signifying a low to moderate positive relationship. This indicates that higher skill levels are associated with an increased acceptance of TVET, suggesting that skills development may positively influence students' perception of TVET.

Furthermore, the correlation between the acceptance level of TVET and the attitude toward TVET is 0.174, showing a low positive correlation. This implies that more positive attitudes toward TVET are marginally associated with higher acceptance levels, although the relationship is weak.

Overall, the significant positive correlations observed suggest that knowledge, skills, and attitudes collectively have a modest positive influence on respondents' acceptance of TVET.

Table 17. Pearson correlation result.

| Variable | *r* | *p* |
|---|---|---|
| Knowledge level | 0.194 | <0.001 |
| Skill level | 0.266 | <0.001 |
| Attitude level toward TVET | 0.174 | <0.001 |

Notes: *r* = correlation coefficient.

## 4. Discussion

The purpose of this study was to examine the relationship between high school students' acceptance of Technical and Vocational Education and Training (TVET) and their knowledge, skills, and attitudes (KSA) related to TVET. The findings revealed that most respondents demonstrated high levels of acceptance toward TVET and possessed a good grasp of TVET-related KSA. Moreover, the relationship between acceptance and KSA was statistically significant, highlighting the interconnection between these variables.

The study suggests that students' acceptance of TVET is prospered by several factors, including their career aspirations, social environment, and familial support. In China's senior high schools, academic achievement and university admission are the factors of students' career choices. This creates pressure between pur-

suing vocational and traditional education pathways. While some students showed openness to TVET, many lacked in-depth knowledge about its potential, resulting in lower acceptance levels. For instance, misconceptions about TVET being limited to "second class education" and its perceived secondary status compared to academic subjects were prevalent.

Interestingly, the study found that many high school students have limited awareness of TVET's specific content, career pathways, and development prospects. In the Chinese general senior high school context, curricula heavily emphasize academic subjects such as Mathematics, English, and Geography, leaving TVET courses belittled. This focus often leads to a superficial understanding of TVET, with some students undervaluing its practical and career-oriented benefits. Additionally, students in this stage of life are still exploring future career options, and without a clear understanding of TVET's value, they may overlook it as a viable pathway (Li, 2020).

A critical barrier identified in the study was the limited availability of hands-on practice and application opportunities in the general high school curriculum. The lack of exposure to practical TVET skills stems from a curriculum that prioritizes academic preparation for the Nationwide Unified Examination for Admissions to General Universities and Colleges. As a result, students often miss the chance to develop practical skills systematically, which negatively impacts their perception and acceptance of TVET.

Encouragingly, the study noted a positive shift in attitudes among some students toward TVET, despite familial skepticism. More young people are beginning to recognize TVET's potential and move beyond the biases of previous generations. However, systemic challenges persist. The academic-focused nature of the high school environment, combined with parental and teacher priorities centered on university entrance, often relegates TVET to a secondary option. This perpetuates negative or neutral attitudes toward TVET among many students.

The study also highlighted differences in TVET acceptance based on gender and grade level. Gender was strongly associated with TVET acceptance, with male students often more enthusiastic about hands-on practical activities, even in the face of failure. Male students' problem-solving tendencies such as trial-and-error approaches contrast with female students, who are more inclined toward analytical and rational problem-solving (Qian et al., 1995; He, 2020). These differences influence how each gender engages with TVET courses. On the other hand, grade level showed a negligible relationship with TVET acceptance. Third-year students, preoccupied with preparing for the college entrance exam, had minimal exposure to TVET, while first-year students focused on adapting to the high school environment. Second-year students, having adjusted to high school life, were more likely to engage with and accept TVET.

The relationship between TVET acceptance and students' knowledge levels, though significant, was weak. Students with greater TVET knowledge tended to show slightly higher acceptance, possibly because they actively sought out TVET-

related information and opportunities. However, the academic focus of assignments and exams limited students' exposure to TVET knowledge, as most learning resources were tailored to the college entrance examination. Similarly, the relationship between skill level and TVET acceptance was weak. Academic pressures and institutional priorities often overshadow the practical value of TVET, leaving students with few opportunities to appreciate its potential.

Despite these challenges, students with hands-on experience in skills training or competitions tended to have a more favorable view of TVET. Such experiences allowed them to witness the tangible benefits of vocational education, developing greater acceptance. Attitudes toward TVET also played a role in influencing acceptance. While some students developed positive attitudes through vocational experiences or parental influence, these cases were relatively rare. The prevailing focus on academic success often limited the impact of positive attitudes on TVET acceptance (Shen, 2022; Shen, 2024).

## 5. Conclusion

This study reveals that students with higher levels of knowledge, skills, and attitudes (KSA) tend to exhibit greater acceptance of TVET. The findings, when analyzed in relation to students' real-life contexts, enlighten on the factors influencing these patterns. For instance, differences in TVET acceptance based on grade levels and gender may be attributed to practical considerations such as students' age, academic competitions, and future aspirations. Notably, persistent negative perceptions of TVET among some students and parents contribute to lower acceptance levels, which, in turn, impact the overall distribution of attitudes.

Encouragingly, more than half of the respondents expressed interest in TVET knowledge and skills, recognizing the positive impact of TVET learning on their future career prospects. Students with a keen interest in TVET or strong practical skills often demonstrated higher levels of creativity and employed diverse learning strategies to excel in TVET courses.

The study highlights the complex interaction of factors influencing students' acceptance of TVET and proposes the need to enhance TVET's demand through both societal perceptions and educational methodologies. Furthermore, the findings provide valuable insights for future research on TVET development in high schools. They also serve as a foundation for designing more engaging and effective TVET programs, aimed at increasing acceptance and nurturing a more positive outlook among prospective students.

Future research should be expanded to include diverse regions, particularly those with varying levels of economic development and cultural backgrounds. Such studies would provide deeper insights into the acceptability of TVET and the knowledge, skills, and attitudes (KSA) of students from different contexts. This broader perspective could lead to a more accurate evaluation of both the potential and the challenges involved in promoting TVET nationwide. Finally, studies on TVET acceptance should not be confined to KSA alone. Future research could

investigate other critical factors, such as students' socio-economic backgrounds, interests in career development, and levels of self-efficacy. By constructing a more comprehensive framework, researchers could better understand the interplay of these variables and their impact on TVET acceptance, ultimately providing more actionable insights to enhance its appeal and effectiveness.

This study has several limitations. First, the sample was drawn exclusively from one district (Yuhua) in Changsha, Hunan Province, which may limit the generalizability of findings to other regions in China with different economic, cultural, or educational contexts. Second, the study relied on self-reported measures of knowledge, skills, attitudes, and acceptance, which are subject to social desirability bias and may not fully reflect actual competencies or behaviors. Third, the cross-sectional design precludes causal inferences; the observed correlations between KSA and acceptance do not establish directionality. Future research should consider longitudinal designs and multi-region samples to address these limitations.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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