# THE ROLE OF ARTIFICIAL INTELLIGENCE (AI) IN EDUCATIONAL AND VOCATIONAL GUIDANCE FOR STUDENTS

## VAI TRÒ CỦA TRÍ TUỆ NHÂN TẠO (AI) TRONG VIỆC TƯ VẤN GIÁO DỤC VÀ NGHỀ NGHIỆP CHO HỌC SINH

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**Abstract -** Career education counseling is a vital factor helping students develop competencies and choose suitable careers. Traditional methods face limitations in data processing. In today's context, artificial intelligence (AI) emerges as an innovative tool to improve effectiveness and expand access to counseling services. The study shows students have positive awareness, high expectations, and willingness to use AI-based counseling systems. Notably, students with color vision deficiency (CVD) exhibit strong demand and trust in this technology. Factor analysis confirms the reliability and feasibility of the measurement scale, providing a foundation for AI integration in career counseling. However, challenges remain in technical infrastructure, data security, and qualified personnel. Combining AI with traditional counseling can enhance service quality and meet workforce development needs in the digital age.

**Key words -** Artificial Intelligence; Career Counseling; High School Students; Color Vision Deficiency; Educational Technology

**Tóm tắt -** Tư vấn giáo dục hướng nghiệp là một yếu tố quan trọng giúp học sinh phát triển năng lực và lựa chọn nghề nghiệp phù hợp. Các phương pháp truyền thống còn hạn chế trong xử lý dữ liệu. Trong bối cảnh hiện nay, trí tuệ nhân tạo (AI) giúp nâng cao hiệu quả và mở rộng khả năng tiếp cận các dịch vụ tư vấn. Nghiên cứu cho thấy học sinh có nhận thức tích cực, kỳ vọng cao và sẵn sàng sử dụng hệ thống tư vấn dựa trên AI. Đáng chú ý, học sinh khuyết tật sắc giác (CVD) thể hiện nhu cầu và sự tin tưởng mạnh mẽ vào công nghệ này. Phân tích nhân tố khẳng định độ tin cậy và tính khả thi của thang đo, tạo nền tảng cho việc tích hợp AI vào tư vấn hướng nghiệp. Tuy nhiên, vẫn còn những thách thức về cơ sở hạ tầng kỹ thuật, bảo mật dữ liệu và nhân lực chuyên môn. Việc kết hợp AI với tư vấn truyền thống có thể nâng cao chất lượng dịch vụ và đáp ứng nhu cầu phát triển nguồn nhân lực trong thời đại số.

**Từ khóa -** Trí tuệ nhân tạo; tư vấn hướng nghiệp; học sinh THPT; khuyết tật sắc giác; công nghệ giáo dục

## 1. Introduction

In the context of the rapid advancement of the Fourth Industrial Revolution (Industry 4.0), artificial intelligence (AI) has become a pivotal tool across fields, including education and career counseling. Career education assists students in self-awareness, exploring career options, and aligning choices with societal demands and personal growth [1], [2]. However, traditional career counseling in many high schools faces limitations such as lack of personalization, heavy reliance on counselors' expertise, and challenges in processing diverse student data [3].

AI, through Big Data and Machine Learning, enhances counseling effectiveness by enabling personalized, data-driven guidance [4], [5]. It enables personalized guidance tailored to students' psychological traits, interests, and abilities, while providing real-time updates on career trends and labor market demands [6]. AI also shows strong potential in supporting students with special needs, particularly those with color vision deficiencies, helping them make informed career decisions [1].

Nonetheless, applying AI in career counseling faces challenges like data constraints, privacy concerns, technological readiness of schools, and policy and infrastructure barriers [1], [7]. Investigating AI's role in career counseling is vital to innovate methodologies, enhance guidance effectiveness, and meet society's need for high - quality human resources.

## 2. Literature review

### *2.1. The concept of career education and counseling*

According to D. E. Super and J. L. Holland, "A profession is a field that employs human physical and mental labor in a limited manner necessary for society (due to the division of labor); it enables individuals to use their labor to obtain the essential means for existence and development" [8], [9]. Vocational education is a process that helps students gain clear self-awareness and develop the skills and knowledge needed to select and pursue careers suitable to their abilities and societal demands. It informs students about careers and fosters positive attitudes and self-orientation [7], [8].

The Ministry of Education and Training of Vietnam considers career education a vital part of general education, contributing to the development of high-quality human resources, supporting students in making suitable career choices, and reducing unemployment and career changes [10]. It also helps students improve soft skills and adapt to the evolving work environment in the Industry 4.0 era [11].

Career counseling assists students in identifying their abilities, interests, and values while offering information on career options to help align choices with personal traits and societal needs. These activities enhance self-understanding and adaptability to labor market changes. The Ministry highlights career counseling's key role in developing human resources for socio-economic growth [2], [7], [10].

In summary, career education is a comprehensive process aimed at supporting students' capability development and preparation for future careers. Since individuals have limited skills and traits suited to specific occupations, career counseling must be continuously integrated throughout general education and training.

### *2.2. Overview of Artificial intelligence applications in education*

AI has increasingly become a transformative force in education, offering new ways to enhance teaching, learning, and guidance. A key application is career guidance, where AI-driven systems improve decision-making by analyzing students' abilities, interests, and performance to provide personalized recommendations. Kim and Lee [1] emphasize that AI tools enable educators to deliver more accurate, individualized counseling, supporting informed educational and vocational choices.

Beyond general education, AI has been adapted to serve diverse student populations, including those with disabilities. Yen [2] presents innovative use of IT to assess color vision deficiency (CVD), integrating AI to support consultation for affected high school students. Similarly, Singh and Kaur [3] develop an AI-enabled adaptive career guidance system for differently-abled students, promoting inclusivity and accessibility. These advances highlight AI's potential to foster equitable education.

Moreover, AI combined with data mining and machine learning helps process large-scale educational data to uncover patterns and predict career paths. Garcia and Smith [4] show how AI-integrated data mining enhances counseling effectiveness with data - driven insights. Liu et al. [5] and Zhao and Wang [6] propose AI systems that use machine learning to recommend suitable career paths based on student data. These systems mark progress in modernizing career guidance through intelligent technologies.

However, existing literature continues to emphasize technological functionalities rather than critically examining the contextual applicability of AI within specific educational systems, particularly in developing countries [3], [4]. While prior studies have affirmed the technical feasibility of AI in enhancing educational services [1], there remains a paucity of empirical research on its integration in public high schools - especially among student groups with special needs such as those with CVD.

This lack of contextualized investigation highlights a critical research gap, as much of the current scholarship is concentrated on higher education or general populations in technologically advanced contexts. In the case of Vietnam, although national policies strongly promote digital transformation in education [10], there is limited evidence-based inquiry into students' perceptions, readiness, and trust in AI-supported career counseling systems.

This study seeks to address that gap by empirically examining how high school students evaluate AI-integrated vocational guidance, with particular attention to its role in fostering equitable access for disadvantaged learners. The research is situated at the intersection of educational technology, vocational psychology, and inclusive education in a developing country context.

Based on this framework, the study proposes the following hypotheses:

***H1:*** *High school students demonstrate positive perceptions of AI-based career counseling across multiple dimensions.*

***H2:*** *Students with CVD exhibit significantly higher levels of readiness and trust toward AI-based systems than their peers.*

***H3:*** *The proposed AI-integrated career counseling model demonstrates structural validity and internal consistency across measured constructs.*

### *2.3. Theoretical framework of AI in career counseling*

AI in career counseling operates by collecting and processing students' personal information such as academic abilities, interests, personality traits, and social conditions to build personalized career recommendation models [1], [4]. The theoretical framework comprises key steps including data collection, data analysis using AI algorithms, model development for prediction, and providing suitable career options tailored to each student [3]. In the study by Yen, AI also demonstrates the capability to support students with disabilities through adaptive interfaces and specialized analyses, ensuring equitable access to career counseling services [2].

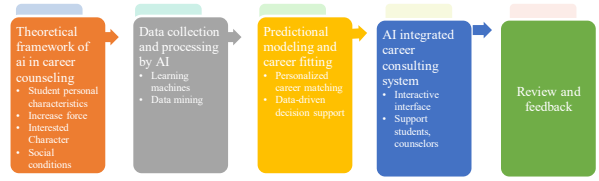


***Figure 1.*** *Theoretical framework of ai in career counseling*

### *2.4. Career counseling models*

Career counseling helps students identify their abilities, interests, and values to make informed career choices. Traditionally, counseling relied on interviews, psychological assessments, and standardized tools but often faced limitations in objectivity, handling large data, and personalizing outcomes [7], [8].

AI advancements have introduced counseling models with greater automation and personalization. AI uses machine learning and data mining to analyze students' abilities, interests, traits, and social contexts, building predictive models for suitable careers [1], [4], [6]. Kim and Lee [1] showed AI enhances counseling quality through big data analytics and tailored recommendations.

AI-supported systems also increasingly address special

needs students. Singh and Kaur's adaptive model [3] provides flexible interaction, detailed analysis, and personalized advice, promoting equitable access to career counseling.

In summary, integrating traditional models with AI fosters more effective, accurate, and flexible career guidance, meeting modern educational demands and diverse student needs [4], [5].

Although AI has shown promise in education, few studies explore its use in high school career counseling, especially in developing contexts. Most prior research focuses on higher education or general learners, with limited attention to inclusive applications for students with specific needs like color vision deficiency. This study addresses that gap by examining student perceptions and proposing a validated model for AI-based guidance in secondary schools, contributing to the academic discourse on equitable educational technology.

## 3. Materials and methods

This mixed-methods study used surveys and interviews to examine AI's role in career counseling for high school students. The sample included 527 randomly selected students from Da Nang high schools and 30 counselors and teachers interviewed in depth. Data were gathered via a standardized student survey on perceptions of career counseling and AI, semi-structured interviews with counselors and teachers, and analysis of relevant secondary documents. The research process is illustrated in Figure 2.

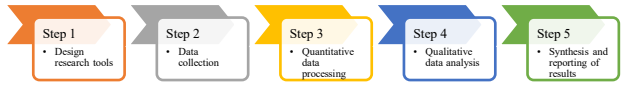


***Figure 2.*** *Research process*

This study used a mixed-methods approach, combining quantitative surveys of 527 stratified-random students from Da Nang high schools with qualitative interviews of 30 counselors and teachers. Data collection included standardized student surveys on career counseling and AI perceptions, semi-structured interviews for counselor insights, and analysis of relevant secondary documents.

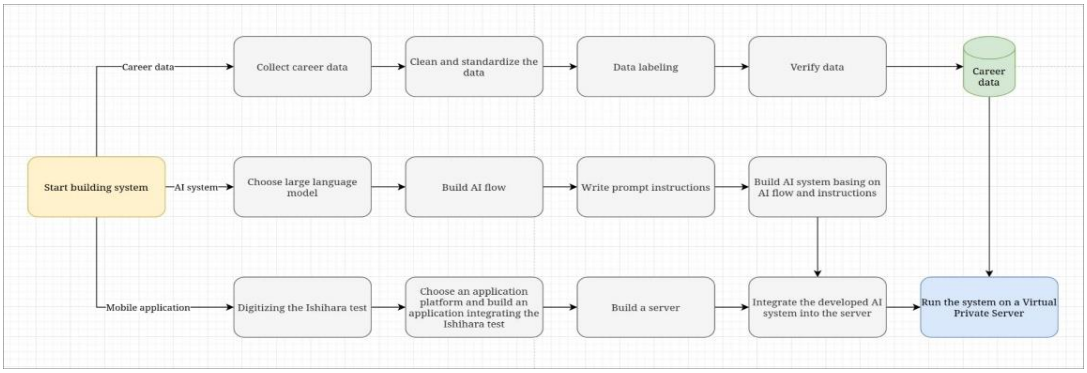


***Figure 3.*** *Development process of the AI-integrated system for CVD assessment and career counseling*

## 4. Results and discussion

### *4.1. Current status of career counseling activities in high schools*

***Table 1.*** *Statistics on the current status of career counseling activities in Vietnam*

| Content | Data / Key Situation |
|---|---|
| Percentage of schools with counseling departments | 30-35% of high schools have counseling departments |
| Rate of students participating in counseling | 40-60% of students participate in counseling activities |
| Popular counseling content | Career, school choice, soft skills, psychology, personal development |
| Challenges | Lack of experts, limited facilities, low student awareness |
| Current counseling methods | Group and individual counseling, workshops, internships, IT support |
| Application of technology in counseling | Less than 20% of schools use digital technology |
| Counseling effectiveness | 60% of students rate positively, 30% receive full counseling |

*Source: Ministry of Education and Training*

According to the Ministry of Education and Training of Vietnam [10], career counseling has been introduced in schools with guidelines and training. However, many schools lack professional counselors, and sessions are infrequent and superficial, limiting counseling's effectiveness in helping students understand their abilities, interests, and the labor market.

### *4.2. Student perceptions of AI role in career education*

The study surveyed 527 students from five Da Nang high schools to assess their awareness and attitudes toward AI-based career counseling. Six criteria were examined: awareness (AW), trust in AI (TR), perceived benefits (BE), trust and security (BR), system expectations (EX), and willingness to use (RD).

***Table 2.*** *Descriptive statistics of the study sample*

| Unit | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 105 | 19.9 | 19.9 | 19.9 |
| | 2 | 85 | 16.1 | 16.1 | 36.1 |
| | 3 | 118 | 22.4 | 22.4 | 58.4 |
| | 4 | 102 | 19.4 | 19.4 | 77.8 |
| | 5 | 117 | 22.2 | 22.2 | 100.0 |
| | Total | 527 | 100.0 | 100.0 | |

Assessment of the reliability of the scale, results are presented in Table 3.

***Table 3.*** *Scale reliability assessed by Cronbach's Alpha*

| Criteria Group | Items | Cronbach's Alpha |
|---|---|---|
| System Awareness (AW) | 3 | 0.815 |
| System Trust (TR) | 3 | 0.842 |
| Perceived Benefits (BE) | 3 | 0.831 |
| Security and Trust (BR) | 3 | 0.792 |
| Student Expectations (EX) | 3 | 0.869 |
| Readiness to Use the System (RD) | 3 | 0.875 |

All groups had Cronbach's Alpha values above 0.7, meeting the acceptable reliability threshold for social science research. Exploratory Factor Analysis (EFA) of the survey data was conducted, with the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy presented in Table 4.

***Table 4.*** *KMO and Bartlett's Test*

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | 0.682 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2724.482 |
| | Df | 153 |
| | Sig. | 0.000 |

The KMO value of 0.682 satisfies the threshold for factor analysis adequacy, as proposed by Kaiser, indicating the sample is adequate for factor analysis. Additionally, Bartlett's Test is statistically significant ($\chi^2(153) = 2724.482$, $p < 0.001$), rejecting the null hypothesis of an identity correlation matrix and confirming that the observed variables are correlated and suitable for factor extraction.

***Table 5.*** *Rotated Component Matrix*[a]

| | Component | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| EX2 | 0.853 | | | | | |
| EX3 | 0.838 | | | | | |
| EX1 | 0.818 | | | | | |
| BE2 | | 0.851 | | | | |
| BE1 | | 0.829 | | | | |
| BE3 | | 0.823 | | | | |
| RD1 | | | 0.845 | | | |
| RD3 | | | 0.834 | | | |
| RD2 | | | 0.822 | | | |
| TR3 | | | | 0.836 | | |
| TR1 | | | | 0.830 | | |
| TR2 | | | | 0.820 | | |
| AW2 | | | | | 0.840 | |
| AW1 | | | | | 0.829 | |
| AW3 | | | | | 0.822 | |
| BR1 | | | | | | 0.831 |
| BR2 | | | | | | 0.828 |
| BR3 | | | | | | 0.801 |

*Extraction Method: Principal Component Analysis.*
*Rotation Method: Varimax with Kaiser Normalization.*
*a. Rotation converged in 5 iterations.*

EFA using Principal Component Analysis extraction and Varimax rotation identified six factors from 18 observed variables, consistent with the initial theoretical model. Variables were clearly grouped with high factor loadings (> 0.8) and no cross-loadings, indicating strong convergence. The rotated matrix converged after five iterations, demonstrating a stable model with high explanatory power. These results confirm the validity of the scale, providing a reliable basis for further analyses such as regression or confirmatory factor analysis (CFA).

The results of the CFA indicate that the measurement model fits the data very well. The CMIN/DF index is 1.041, falling within the ideal range of 1 to 3, demonstrating that the model is neither overly complex nor misaligned with the observed data.

***Table 6.*** *Model Fit Measures*

| Measure | Estimate | Threshold | Interpretation |
|---|---|---|---|
| CMIN | 124.879 | -- | -- |
| DF | 120 | -- | -- |
| CMIN/DF | 1.041 | Between 1 and 3 | Excellent |
| CFI | 0.998 | >0.95 | Excellent |
| SRMR | 0.026 | <0.08 | Excellent |
| RMSEA | 0.009 | <0.06 | Excellent |
| PClose | 1.000 | >0.05 | Excellent |

Global fit indices such as CFI = 0.998, SRMR = 0.026, and RMSEA = 0.009 all meet or exceed recommended thresholds, indicating a high explanatory power and stable construct structure of the model. Additionally, the PClose value of 1.000 confirms the model's strong fit with the normal distribution assumption, thereby reinforcing the reliability and conceptual validity of the factors in the CFA model.

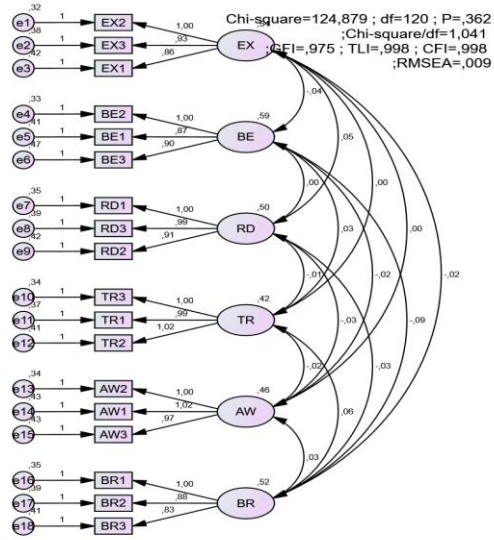


***Figure 4.*** *CFA Measurement Model for AI-Based Career Counseling*

Figure 3 illustrates the measurement model of the Confirmatory Factor Analysis (CFA) for the AI-integrated career counseling scale. The model includes six latent constructs EX, BE, RD, TR, AW and BR - each measured by three observed variables. All factor loadings exceed 0.8, indicating strong convergent validity. The model fit indices demonstrate a good fit to the data, confirming the reliability and validity of the scale.

Analysis of the mean and standard deviation for each group of criteria shows that the average scores range from 3.87 to 4.01. These results reflect the level of agreement and the dispersion in students' evaluations of the AI-integrated career counseling system.

***Table 7.*** *Model Fit Measures*

| Criteria Group | Mean | Std. Deviation |
|---|---|---|
| AW | 3.87 | 0.64 |
| TR | 3.92 | 0.71 |
| BE | 4.01 | 0.67 |
| BR | 3.85 | 0.73 |
| EX | 3.90 | 0.69 |
| RD | 3.95 | 0.70 |

Descriptive statistics indicate that the observed variables in the scale have mean scores ranging from 3.87 to 3.97, suggesting that students generally exhibit a positive consensus toward the evaluation criteria of the AI-integrated career counseling system. The standard deviations range from 0.875 to 0.972, reflecting a moderate level of dispersion, which indicates diversity in student responses without significant variance.

Notably, the variables EX1-EX3, TR1-TR3, and RD1-RD3 all have mean scores above 3.9, demonstrating a high level of interest and expectation regarding the support capabilities of the AI system. No variables have mean scores below 3.5, which further reinforces the feasibility and acceptance of the system among students in the general education context.

***Table 8.*** *Analysis of variance (ANOVA) results*

| Criteria Group | F-value | df (Between/Within) | Sig. (p-value) |
|---|---|---|---|
| AW | 0.792 | 4 / 522 | 0.530 |
| TR | 0.910 | 4 / 522 | 0.459 |
| BE | 0.899 | 4 / 522 | 0.464 |
| BR | 0.554 | 4 / 522 | 0.696 |
| EX | 0.585 | 4 / 522 | 0.675 |
| RD | 0.488 | 4 / 522 | 0.743 |

ANOVA analysis showed no statistically significant differences among students from different high schools across all six surveyed criteria groups. Specifically, all significance values (Sig.) were greater than 0.05, indicating similar levels of awareness, trust, perceived benefits, expectations, and willingness to use the AI-based counseling system among schools. This reflects the universal attitudes and needs of students regarding the application of intelligent technology in career counseling, regardless of geographic location or school conditions.

These findings are in line with the work of Garcia and Smith [4], who reported that AI-based systems demonstrate broad applicability when students perceive high benefit and usability across contexts. The absence of significant differences among schools further suggests the potential for standardized implementation, even in diverse educational environments. This reinforces the role of AI as a scalable and equitable solution, as highlighted in the work of Singh and Kaur [3] on inclusive digital counseling.

These results provide evidence that an AI-based counseling system, if implemented widely, would be suitable for most students without requiring school-specific adjustments. The consistency in student evaluations also suggests the potential effectiveness of applying technological solutions to career education across the entire general education system.

Comparison of evaluation results between color vision deficient students and normal students is shown in Table 9.

***Table 9.*** *Comparison of evaluation levels between CVD students and normal students*

| Criteria Group | Mean of CVD | Mean of Normal | t | p |
|---|---|---|---|---|
| AW_mean | 3.82 | 3.91 | -1.36 | 0.1905 |
| TR_mean | 3.84 | 3.85 | -0.144 | 0.8875 |
| BE_mean | 3.82 | 3.84 | -0.203 | 0.8418 |
| BR_mean | 3.9 | 3.93 | -0.352 | 0.7291 |
| EX_mean | 3.94 | 3.93 | 0.126 | 0.9014 |
| RD_mean | 3.92 | 3.74 | 2.305 | 0.0336 |

The only criterion showing a statistically significant difference was RD, with students with CVD having a significantly higher mean score ($p = 0.0336$).

Consistent with the insights of Yen [2], students with specific learning challenges-such as CVD-demonstrate a heightened responsiveness to digital counseling solutions that overcome the constraints of traditional methods. These results further underscore the inclusive potential of AI when thoughtfully integrated into school-based guidance systems. By foregrounding a typically underrepresented group, the study offers a novel contribution to the discourse on educational equity and highlights AI's role in bridging longstanding accessibility gaps in career counseling.

### *4.3. Results of interviews with 30 administrators and teachers*

Interviews with 30 administrators and teachers revealed a broad consensus regarding the potential of AI in career counseling, particularly in enhancing the personalization of counseling services and enabling rapid, accurate processing of student data. AI was recognized as a valuable tool for expanding the scope of career guidance and for timely updating of labor market trends.

To analyze the qualitative data, the study employed content analysis supported by NVivo software. Qualitative data were coded using NVivo in three stages - open, axial, and selective - to extract key themes. This analytical framework ensured systematic organization, transparency, and traceability of interpretations derived from interview transcripts.

The coding process yielded four major themes: (1) the potential of AI in personalizing counseling services, (2) technical and human-related implementation challenges, (3) the irreplaceable role of human counselors in student interaction and psychological support, and (4) the need for training and policy support for effective deployment. These insights were essential in contextualizing the practical requirements and limitations for implementing AI in educational settings.

### *4.4. Difficulties and challenges in traditional career counseling*

The analysis reveals that traditional career counseling faces significant limitations. Most counseling activities still rely on conventional tools such as surveys, interviews, and basic psychological tests without integration of digital technologies or big data analytics. According to Yen, students with CVD face unique barriers in accessing career counseling services due to the lack of specialized support tools and adaptive methods, restricting their opportunities to select appropriate careers [2].

Furthermore, the study found that many schools lack adequate IT infrastructure and have insufficient training programs to equip counseling staff with necessary digital competencies. These gaps hinder the effective application of new technologies aimed at improving counseling quality [3], [6]. The data also indicate that shortages of specialized personnel and technological support limit the capacity of schools to meet the growing student population and the increasing demand for personalized career guidance.

These findings underscore the urgent need to address both technological and human resource challenges to enhance the effectiveness and inclusiveness of career counseling services in the current educational context.

### *4.5. Demand and potential for applying AI in career counseling*

This section synthesizes the quantitative analysis results from a survey of 527 high school students in Da Nang, serving as the basis for evaluating the demand for and potential application of AI-based career counseling systems.

***Table 10.*** *Summary of analysis results*

| Key Results | Index | Evaluation Threshold | Interpretation |
|---|---|---|---|
| Mean score of RD group | 3.93 | > 3.5 | Students are willing to use AI in counseling |
| Mean score of EX group | 3.92 | > 3.5 | Students have high expectations for the AI system |
| Mean score of BE group | 3.91 | > 3.5 | Students clearly recognize the benefits of AI |
| Comparison of RD between CVD and non-CVD students | p = 0.0336 | < 0.05 | CVD students show higher demand |
| Factor loadings of EX, BE, RD groups | > 0,8 | > 0.6 | Factors clearly reflect grouped needs |
| CFI / RMSEA / PClose | 0.998 / 0.009 / 1.000 | CFI > 0.95; RMSEA < 0.06 | Measurement model fits well and can be implemented |

Survey data indicate that the demand for applying AI in career counseling is well-grounded in practical reality. Specifically, criterion groups such as perceived benefits (M = 3.91), student expectations (M = 3.92), and readiness to use (M = 3.93) all achieved high mean scores on a 5-point scale, reflecting a clear consensus and strong desire among students to engage with intelligent counseling systems.

Notably, t-test results reveal that students with CVD exhibit a significantly higher readiness to use AI-based systems compared to their peers without CVD ($p < 0.05$), indicating that the potential application of AI is not only universal but also capable of providing valuable support to vulnerable groups within education.

Furthermore, the CFA model testing six measurement factors demonstrated excellent fit to the data (CFI=0.998; RMSEA=0.009), confirming that the scale system accurately reflects students' cognitive and behavioral structures. This reinforces the practicality and scalability of AI-based counseling systems in the context of modern education.

### *4.6. The role of AI in educational and career guidance for students*

The application of AI in the career counseling process is regarded as a significant advancement aimed at enhancing innovation, personalization, and accessibility of counseling services for high school students. Quantitative survey results from 527 students in Da Nang provide compelling evidence of the positive impact of the AI-integrated counseling system. This evidence is reflected in several factor groups assessing students' awareness, expectations, and perceived effectiveness of the system.

Firstly, the BE factor group reflects students' awareness of the value AI brings to career guidance. With a mean score is 3.91 (Table 10), students highly appreciate that the AI system facilitates access to career information suited to their interests and abilities. This confirms AI's potential to partially substitute limited human resources in schools.

Secondly, the EX group recorded a mean score is 3.92, indicating students' trust in the AI system's ability to support academic and career orientation. This expectation reflects a willingness to adopt new technologies and a practical need to use AI for earlier and more proactive career decision-making.

Thirdly, the TR and BR groups both achieved high mean scores (M = 3.94), demonstrating that students are not only willing to use but also trust the transparency and security of personal information provided by the AI system - critical given the sensitive personal data involved in career counseling.

These findings are consistent with Kim and Lee [1], who demonstrated that students are more likely to engage with AI-based guidance when the system is perceived as transparent, personalized, and relevant to their interests. Similarly, Liu et al. [5] confirmed that perceived benefits and expectations are strong predictors of technology adoption in educational contexts.

The significantly higher readiness among students with CVD also aligns with Yen [2], who emphasized that learners with specific needs are more open to digital interventions that offer targeted support. This suggests that AI may serve not only as a scalable solution but also as an inclusive tool in addressing accessibility gaps in traditional counseling.

Unlike previous studies that focused primarily on higher education or generalized samples, this study provides empirical evidence from high school students in

Vietnam - a context where research on AI-integrated vocational guidance remains limited. Therefore, the present results contribute a contextualized perspective to the broader discourse on educational technology and equity in career counseling.

Fourthly, EFA results showed all BE, EX, TR, and BR factors had factor loadings above 0.8, indicating strong convergence and clear distinction of each construct's role. CFA results (CFI = 0.998, RMSEA = 0.009, PClose = 1,000) confirmed an excellent model fit, establishing a solid foundation for designing AI counseling systems in general education.

From these findings, AI is not only supportive but also transformative for traditional career counseling by enabling:

- Personalized counseling content tailored to each student;

- Automated, rapid feedback anytime and anywhere;

- Detection of hidden issues such as color vision deficiency and vocational misalignment;

- Support for students with limited access to traditional counseling (e.g., remote areas or students with disabilities).

## 5. Conclusion

Career education counseling plays a fundamental role in helping high school students develop competencies and make informed career decisions. However, traditional methods often face significant challenges, particularly in providing personalized support and managing diverse student data. Within the context of the Fourth Industrial Revolution, integrating AI into career counseling systems offers promising opportunities to enhance both effectiveness and accessibility.

This study, conducted with 527 high school students in Da Nang, reveals high levels of awareness, positive expectations, and readiness to adopt AI-based counseling systems. Particularly, students with CVD demonstrated a stronger demand for and trust in these technologies. The validated measurement model confirms the reliability and feasibility of AI applications in career guidance, with clear potential to support equity and personalization in educational settings.

In addition to empirical insights, the study contributes to academic discourse by proposing a contextualized model for AI-integrated career counseling in high schools-an area underrepresented in current literature. The findings offer practical implications for policymakers aiming to modernize career guidance systems through scalable, inclusive, and data-driven technological solutions.

Integrating AI with traditional counseling is vital to meet students' evolving needs and support workforce development in the digital era.

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