Validation of the Model of Drivers for Educational and Career Guidance for School Students (Case Study: Secondary Schools in Tehran Province)

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Article Info	ABSTRACT
	Objective: This study aimed to identify and validate a model of key drivers of academic and career guidance among secondary school students in Tehran Province, providing a scientific framework to improve guidance policies and programs within the education system. **Methods**: This applied study employed a mixed-methods (qualitative–quantitative) design. In the qualitative phase, data were collected through document analysis and semi-structured interviews with 24 university experts and Ministry of Education specialists selected via snowball sampling until theoretical saturation was reached. In the quantitative phase, the population included principals, vice-principals, and academic counselors of upper secondary schools in Tehran Province (N = 1,120). Using Cochran's formula, 286 participants were selected through proportional stratified random sampling. Data were gathered using a researcher-developed questionnaire and analyzed through confirmatory factor analysis (CFA). **Results**: Qualitative analysis identified 5 overarching themes, 16 organizing themes, and 74 basic themes underlying the academic and career guidance drivers' model, including individual, environmental, human, structural, and curriculum-related empowerment factors. CFA results confirmed the statistical significance of all model components, and model fit indices demonstrated satisfactory validity. **Conclusions**: The findings suggest that revising policies, curriculum content, educational resources, and assessment methods can enhance students' awareness of academic fields and related careers, supporting more informed academic and career decision-making.

Introduction

Education can be considered one of the most significant events in an individual's life, as it provides the foundation for personal growth and professional development. Accordingly, education has long been a central focus of psychologists, counselors, and educational policymakers (Dorman et al., 2022). However, transformations in industrial and economic indicators within the context of the globalized world have created major challenges in facilitating students' transition from school to the world of work. Given that education constitutes the core driver of national economic growth and development, a considerable number of students remain uncertain about which career paths to pursue after completing secondary education (Njiru, 2016; Hagberg et al., 2019). Decision-making regarding academic and career pathways is among the most difficult tasks students face upon leaving school, and future individual and social roles and expectations are profoundly shaped by these decisions (Igbore & Akinlosotu, 2016).

Academic and career guidance, as a fundamental pillar in the development of human capital, plays a pivotal role in enabling students' successful transition from formal education to higher education and the labor market (Mehram et al., 2021). Guiding students in selecting academic fields, identifying essential skills, determining the level of academic effort required, and exploring suitable occupations has long-term and enduring impacts on their academic achievement as well as on broader social and economic development (Wong & Yuen, 2019). Consequently, educational systems worldwide have prioritized the development of academic and career readiness standards aimed at challenging existing learning structures and aligning school curricula with preparation for university education and employment in the 21st century (Park, Desimone, & Parsons, 2020). Official statistics indicate that most newly created jobs in the United States by 2018 required a university degree, positioning higher education as a gateway to economic security and social mobility (Torpey & Watson, 2014). Nevertheless, adolescents often lack sufficient information and capacity to effectively navigate complex academic and career choices (Wong & Yuen, 2019), underscoring the need for student empowerment as a prerequisite for future readiness.

Each educational stage possesses distinct characteristics; among them, secondary education is particularly critical, as students are required to make some of the earliest and most consequential decisions of their lives—choices that can shape future academic and life success. During this period, students must select academic tracks that ultimately influence occupational opportunities.

Such decisions are more likely to be realistic and effective when aligned with students' abilities, talents, skills, aptitudes, intelligence, and competencies (Ghoosh, 2021). Although the selection of an educational program constitutes the first step toward career choice, globalization has rendered this process increasingly complex. In modern societies, individuals are afforded greater autonomy in shaping their futures and career trajectories (Aksuzoglu, 2016). Research indicates that secondary school students report significant anxiety regarding academic and career planning, and that teachers and counselors play a crucial role in alleviating these concerns through effective guidance and counseling services (Al-Sofani & Abulsaud, 2020).

Guidance and counseling occupy a unique and indispensable role in personal and social development, serving as a driving force throughout the human lifespan (Ziegler & Opdenakker, 2018). All members of society require guidance and education to achieve growth and self-actualization, and students—at the core of the educational system—require continuous guidance to adapt to ongoing societal transformations (Plant, 2010). Haug (2019) emphasizes that investing in human resource training for academic guidance is not merely desirable but essential, warranting dedicated educational resources. In higher education contexts, the use of big data technologies to enhance academic guidance has become an integral component of talent development initiatives in colleges and universities (Liang, Di, & Zheng, 2024).

In Iran, the history of school-based guidance and counseling dates back to November 1964 with the establishment of programs aimed at identifying students' talents and interests to support academic and occupational decision-making (Hosseini Birjandi, 2018). Subsequent policy developments, including the Comprehensive Education System Act (1988), explicitly emphasized academic and career guidance based on students' abilities, interests, effort, and societal needs (Safi, 2015). The implementation of the 3–3–6 educational system and the National Curriculum Framework further institutionalized academic guidance, assigning formal responsibilities to school counselors (Executive Guidelines for Academic Guidance, 2017).

Despite these efforts, academic track selection remains a critical challenge. Recent reforms to the academic guidance system, particularly those implemented at the ninth-grade level, have faced substantial criticism from students and parents due to perceived inequities and inconsistencies in assessment criteria. Moreover, labor market data indicate persistent graduate unemployment, including among highly educated individuals, suggesting a misalignment between educational

pathways and employment opportunities. Statistics from the Statistical Center of Iran (2023) reveal that 39% of the unemployed population consists of higher education graduates, with notable disparities across academic fields and demographic groups.

These findings highlight systemic shortcomings in academic and career guidance during secondary education, particularly in aligning students' interests, abilities, and labor market demands. Although prior studies have proposed models for academic guidance at the lower secondary level, there remains a critical lack of validated frameworks for upper secondary education, especially at Grade 12. Consequently, many students make academic choices based on limited guidance from counselors or family members, often realizing the limited occupational prospects of their chosen fields only after entering higher education.

At the national level, while policy documents such as the Fundamental Transformation Document of Education emphasize the importance of academic guidance (Ministry of Education, 2018), most existing studies focus on descriptive analyses or the evaluation of isolated programs. A comprehensive, context-sensitive model that simultaneously identifies and validates the key cognitive, familial, and institutional drivers of academic and career guidance within upper secondary schools in Tehran Province has yet to be systematically developed. Given Tehran's central role as the educational and economic hub of Iran, such a model is critically needed.

Accordingly, the present study seeks to address this gap by answering the following research question: What is the model of academic and career guidance drivers among upper secondary school students, and how valid is this model?

Material and Methods

This study was applied in terms of purpose and employed an exploratory mixed-methods design (qualitative and quantitative). In terms of implementation, thematic analysis was used in the qualitative phase, followed by a cross-sectional survey design in the quantitative phase. Participants in the study comprised two groups: (1) university faculty members holding a PhD in educational sciences with at least five years of academic experience and a minimum of two scholarly outputs (e.g., journal articles, books, or funded research projects) in the field of academic and career guidance; and (2) educational administrators and counselors employed by the Ministry

of Education, holding at least a master's degree, with a minimum of 15 years of professional experience and executive responsibilities in academic and career guidance for students.

Qualitative participants were selected through purposive sampling using the snowball technique. Initially, experts were identified and approved by the research supervisor based on their research background and professional experience. Semi-structured interviews were conducted with 24 experts until theoretical saturation was achieved. Interviews were conducted face-to-face, lasting between 30 and 60 minutes. All interviews were transcribed verbatim and imported into MAXQDA software for analysis.

In the qualitative phase, both library-based (document analysis) and field methods were employed. The library method was used to review theoretical foundations and prior research, followed by field data collection through semi-structured interviews based on a predefined interview protocol. In the quantitative phase, the statistical population consisted of all principals, vice-principals, and academic counselors of upper secondary schools in Tehran Province (N = 1,120). The sample size was calculated using Cochran's formula (n = 286), and participants were selected through proportional stratified random sampling. Data were collected using a researcher-developed questionnaire comprising 74 items, 16 components, and 5 dimensions, rated on a 7-point Likert scale.

To enhance the trustworthiness of qualitative findings, Lincoln and Guba's triangulation framework was employed, addressing credibility, dependability, confirmability, and transferability. Data triangulation was achieved through the use of multiple data sources, methods, researchers, and theoretical perspectives. Credibility was ensured by maximum variation sampling and continued data collection until saturation. Internal validity was supported through face validity assessment. Peer review by an external auditor enhanced confirmability, while detailed contextual descriptions and rich participant quotations supported transferability.

In the quantitative phase, content validity was assessed using the Content Validity Ratio (CVR). All CVR values exceeded 0.70 and were above Lawshe's acceptable threshold (0.42), indicating adequate content validity. Reliability was evaluated using Cronbach's alpha, with all coefficients exceeding 0.70, confirming acceptable internal consistency.

Table 1. Content Validity and Reliability Coefficients of Questionnaire Components

Components	CVR	Cronbach's α	Components	CVR	Cronbach's α
Aptitude and Capacity	0.749	0.843	Counselors' Knowledge and Skills	0.748	0.897
Academic and Career Orientations	0.788	0.900	Review of Academic Guidance Programs	0.895	0.925
Personal and Career Experiences and Expectations	0.826	0.926	Revision of Career Awareness Programs	0.907	0.945
Cultural Attitudes Toward Occupations	0.759	0.850	Use of Up-to-Date Information and Communication Technologies	0.830	0.910
Family Background	0.805	0.917	Effective Use of Assessment Criteria and Instruments	0.845	0.931
Labor Market Conditions	0.867	0.924	Redesign of Policies and Objectives	0.851	0.924
Increasing Parents' Awareness and Understanding	0.796	0.916	Revision of Content and Educational Resources	0.844	0.911
Teachers' Knowledge and Competencies	0.703	0.876	Changes in Assessment Methods	0.790	0.896

Qualitative data were analyzed using theoretical coding (open, axial, and selective coding) within a thematic analysis framework. The coding process was conducted in four stages using MAXQDA (version 24.4). Quantitative data were analyzed using confirmatory factor analysis (CFA), with statistical analyses performed using SPSS (version 24) and LISREL software.

Results

The results of the qualitative coding process led to the identification of 5 overarching themes, 16 organizing themes, and 74 basic themes as the key drivers of academic and career guidance among students. These findings are presented in Table 2.

Table 2. Final Themes Derived from Review, Refinement, and Thematic Analysis

Overarching Themes	Organizing Themes	Basic Themes
Individual Empowerment Factors	Aptitude and Capacity	1. Students' awareness of cognitive and analytical abilities (self-awareness) 2. Belief in innate talents 3. Development of latent cognitive abilities 4. Perseverance and effort 5. Personal traits such as resilience and self-confidence
	Academic and Career Orientations	6. Accurate understanding of personal identity and analytical skills 7. Recognition of personal potential to map career paths 8. Acquiring information about professional work environments 9. Self-efficacy and confidence in future academic and career prospects 10. Alignment of career choice with personal interests and lifestyle
	Personal and Career Experiences and Expectations	11. Viewing occupations as stable income sources 12. Gaining work experience through part-time jobs 13. Internship and apprenticeship experiences 14. Voluntary work to understand job nature and acquire skills
Environmental Empowerment Factors	Cultural Attitudes Toward Occupations	15. Effective role of mass media in promoting academic and career guidance culture 16. Adoption of supportive policies to foster positive occupational culture

		17. Modifying parents' attitudes toward occupations to align student capacity with careers 18. Promoting the value of all occupations regardless of cultural bias 19. Parent orientation sessions to prevent imposing personal aspirations on students
	Family Conditions	20. Considering family economic status when choosing costly academic fields 21. Attention to resources required for launching desired occupations 22. Addressing family economic challenges through income-sustaining career choices 23. Balancing social prestige with individual capability 24. Eliminating traditional views toward career choice 25. Parents' tendency to encourage children to pursue similar professional careers
	Labor Market	26. Connecting to the labor market through appropriate career pathways 27. Informed and autonomous choice within environmental constraints 28. Creating adequate employment infrastructures 29. Analyzing labor market factors such as income, promotion, and personal fulfillment
Human Empowerment Factors	Increasing Parents' Awareness	30. Training parents to provide emotional support during career choice 31. Motivating families to nurture children's innate talents 32. Parents informing students about academic fields and related careers 33. Granting students autonomy in academic and career decision-making
	Teachers' Knowledge and Competencies	34. Training teachers to provide accurate subject-related guidance 35. Developing teachers' practical skills in specialized subject areas 36. Utilizing teachers in academic track guidance
	Counselors' Knowledge and Skills	37. Addressing weaknesses in student planning and guidance 38. Training and recruiting qualified career guidance specialists 39. Enhancing counselors' professional competencies 40. Systematic and individualized career planning for upper secondary students
Structural Empowerment Factors	Review of Academic Guidance Programs	41. Student-centered academic guidance methods 42. Active and voluntary student participation in guidance processes 43. Effective parental involvement in academic and career experiences 44. Utilizing internal and external educational system capacities 45. Balanced distribution of students across academic tracks 46. Equitable access to guidance services
	Revision of Career Awareness Programs	47. Aligning student characteristics with labor market needs 48. Providing information on future in-demand occupations 49. Hands-on occupational experiences for students 50. Professional supervision of students' work experiences 51. Commitment of stakeholders to career guidance processes 52. Balancing students' skills and interests in career choice 53. Strengthening links between industry, services, and secondary schools
	Use of Up-to-Date ICT	54. Employing modern educational technologies for career guidance in underserved areas 55. Using counseling support systems to compensate for time constraints 56. Implementing virtual career education applications in schools 57. Strengthening software resources for academic and career counseling 58. Creating student capacity and interest databases
	Effective Use of Assessment Criteria and Tools	59. Identifying and providing accurate assessment instruments 60. Using valid tools to assess students' abilities and talents 61. Precise measurement of personality traits and mental/physical

		capacities 62. Employing online career assessment tests
Curriculum Empowerment Factors	Redesign of Policies and Objectives	63. Revising scoring and selection approaches for academic tracks 64. Aligning interests, abilities, and talents in track selection 65. Increasing practical and skill-based coursework 66. Positioning upper secondary education as an exploratory stage
	Revision of Content and Resources	67. Designing theoretical and practical courses related to guidance 68. Revising curricula to identify and stimulate talents and interests 69. Shifting from textbook-centered to field-oriented learning resources 70. Utilizing supplementary and non-textbook learning materials
	Changes in Assessment Methods	71. Integrating theoretical and practical assessment approaches 72. Prioritizing practical assessment outcomes 73. Preparing school stakeholders for implementing practical evaluations 74. Rigorous monitoring of skill-based, internship, and career exploration programs

The findings presented in Table 2 indicate that all identified themes were validated, resulting in a comprehensive model comprising 74 basic themes, 16 organizing themes, and 5 overarching themes, organized into major and sub-theme categories. The final thematic network of the model based on the overarching themes is illustrated in Figure 1.
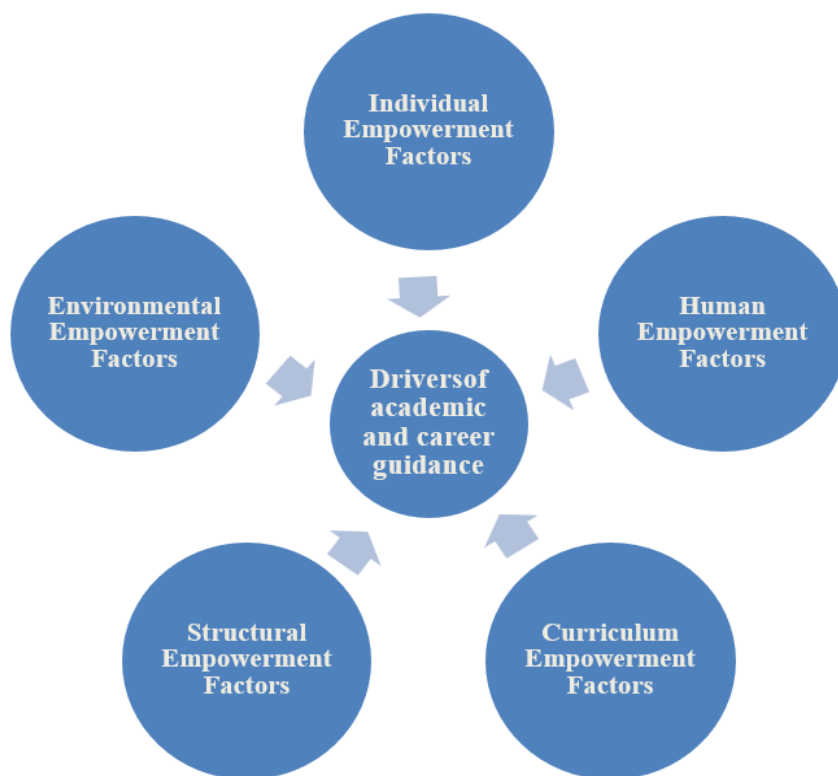

Figure 1. Final model of key drivers of academic and career guidance for secondary school students

To validate the model, the Kolmogorov–Smirnov (K-S) test was first conducted to assess the normality of the data.

Table 3. Kolmogorov–Smirnov Test Results

Overarching Theme	Significance Level	df	Test Statistic	Conclusion
Individual Empowerment Factors	0.408	284	8.061	Normal
Environmental Empowerment Factors	0.092	284	11.75	Normal
Human Empowerment Factors	0.135	284	8.79	Normal
Structural Empowerment Factors	0.211	284	11.63	Normal
Curriculum Empowerment Factors	0.079	284	9.22	Normal

As shown in Table 3, the significance values for all overarching themes were greater than 0.05, and the K-S statistics were higher than 1.96. Therefore, the distributions of all themes were normal, indicating that parametric tests could be appropriately applied for further analysis.

Subsequently, Confirmatory Factor Analysis (CFA) was conducted to generalize the results to the population and test the significance of relationships between observed and latent variables.

Confirmatory Factor Analysis Results by Overarching Theme

1. Individual Empowerment Factors

Factor loadings and significance coefficients for the basic and organizing themes were all acceptable, indicating that observed variables adequately explained the latent variable. The factor loadings (λ) and t-values were: Aptitude and Capacity → Individual Empowerment ($\lambda = 0.93$, t = 16.03), Interests and Preferences → Individual Empowerment ($\lambda = 0.95$, t = 15.48) and personal Experiences and Expectations → Individual Empowerment ($\lambda = 0.96$, t = 18.68). All observed variables had factor loadings above 0.4, and t-values were outside ±1.96, confirming significance.

2. Environmental Empowerment Factors

Factor loadings and significance levels were acceptable. Observed variables explained the latent construct effectively: Cultural Attitudes Toward Occupations → Environmental Empowerment ($\lambda = 0.89$, t = 18.34), Family Conditions → Environmental Empowerment ($\lambda = 0.90$, t = 15.12) and labor Market → Environmental Empowerment ($\lambda = 0.95$, t = 18.45). All loadings > 0.4 and t-values significant at $p < 0.05$.

3. Human Empowerment Factors

Observed variables adequately explained latent constructs: Increasing Parental Awareness → Human Empowerment ($\lambda = 0.93$, t = 13.34), Teachers' Knowledge and Competencies → Human

Empowerment (λ = 0.91, t = 18.47) and counselors' Knowledge and Skills → Human Empowerment (λ = 0.94, t = 15.37). Factor loadings > 0.4 and t-values significant.

4. Structural Empowerment Factors

Factor loadings for organizing and basic themes were satisfactory: Reviewing Academic Guidance Programs → Structural Empowerment (λ = 0.90, t = 17.11), Revising Career Awareness Programs → Structural Empowerment (λ = 0.91, t = 15.79), Use of Up-to-Date ICT → Structural Empowerment (λ = 0.87, t = 17.74) and effective Use of Assessment Tools → Structural Empowerment (λ = 0.88, t = 15.85). All loadings > 0.4 and t-values significant at p < 0.05.

5. Curriculum Empowerment Factors

Observed variables successfully explained latent constructs: Redesigning Policies and Objectives → Curriculum Empowerment (λ = 0.92, t = 15.11), Revising Content and Resources → Curriculum Empowerment (λ = 0.90, t = 18.60) and changing Assessment Methods → Curriculum Empowerment (λ = 0.89, t = 17.54). All loadings > 0.4 and t-values significant.

Table 4. Model Fit Indices for Key Drivers of Academic and Career Guidance

Model Dimension	χ^2	df	χ^2/df	RMSEA	P-value	GFI	AGFI	CFI	IFI
Individual Empowerment	666.04	224	2.97	0.068	0.000	0.92	0.90	0.96	0.94
Environmental Empowerment	652.81	227	2.88	0.051	0.000	0.92	0.91	0.95	0.94
Human Empowerment	262.51	91	2.88	0.038	0.000	0.91	0.90	0.95	0.93
Structural Empowerment	883.39	305	2.90	0.038	0.000	0.93	0.92	0.96	0.94
Curriculum Empowerment	270.57	92	2.94	0.023	0.000	0.91	0.90	0.94	0.93

As shown in Table 4, after removing covariance errors, all models demonstrated good fit. The χ^2/df ratio for all overarching themes was below 3, RMSEA values were below 0.08, and other indices (GFI, AGFI, CFI, IFI) were above 0.90, confirming the adequacy of the model.

Overall, the final model of key drivers of academic and career guidance for upper secondary students comprised 74 basic themes, 16 organizing themes, and 5 overarching themes. CFA results confirmed all factor loadings and significance coefficients were within acceptable ranges, establishing the validity of the model.

Individual Empowerment: 3 organizing themes (Aptitude & Capacity, Interests & Preferences, Personal Experiences) with 14 basic themes

Environmental Empowerment: 3 organizing themes (Cultural Attitudes, Family Conditions, Labor Market) with 15 basic themes

Human Empowerment: 3 organizing themes (Parental Awareness, Teachers' Competence, Counselors' Skills) with 11 basic themes

Structural Empowerment: 4 organizing themes (Review Programs, Career Awareness, ICT, Assessment Tools) with 22 basic themes

Curriculum Empowerment: 3 organizing themes (Policies & Objectives, Content & Resources, Assessment Methods) with 12 basic themes

Discussion

In this study, the researcher aimed to identify the drivers of academic and career guidance among high school students. Based on the analysis, 74 basic themes, 16 organizing themes, and 5 overarching themes were identified. The overarching themes, termed as general drivers of academic and career guidance, include individual enablers, environmental enablers, human enablers, structural enablers, and curriculum enablers. The findings of the present study have been extensively interpreted and analyzed as follows:

The interpretation of the results indicates that the academic guidance process for students in Tehran is influenced by a complex network of conflicting forces, organized into five main categories. Environmental and human enablers (family pressure and poor quality of counseling) exert the strongest inhibiting effects, as cultural expectations and lack of access to reliable information undermine students' ability to realistically assess their options. This situation reinforces negative individual enablers, such that fear of failure based on external standards overshadows choices aligned with genuine interests and abilities. Consequently, the existing academic guidance model in Tehran province, rather than relying on individual empowerment, is largely dominated by structural and curricular constraints that lack sufficient alignment with labor market needs and cultural dynamics. To improve this process, interventions should simultaneously focus on enhancing the quality of counseling services (human enablers), revising educational content to provide accurate career information (structural and curriculum enablers), and educating parents and students to reduce reliance solely on occupational stereotypes (reducing environmental pressure), thereby aligning educational outcomes with human development and economic needs.

The interpretation of the overarching theme of environmental enablers (including 15 basic themes organized into three organizing themes: reforming cultural perspectives on occupations, family

circumstances, and labor market conditions) shows that the social and economic environment surrounding students acts as a strict and limiting filter on potential choices. This theme indicates that even if a student is individually self-aware (basic theme 1), environmental factors guide or restrict choices in three fundamental ways:

Cultural and social perspective: The presence of occupational stereotypes and hierarchies (theme: reforming cultural perspective) prevents certain paths (e.g., technical or artistic careers) from being prioritized, even when they align with individual talents.

Family influence: Family expectations (theme: family circumstances) serve as a major source of environmental pressure, often steering educational choices toward safe or socially approved paths, which may not necessarily match labor market realities.

External reality (labor market): Students face a lack of reliable information about future careers (theme: labor market), which leads to conservative and often unrealistic choices.

In summary, this theme confirms that in Tehran, the social and cultural environment is the main deficiency in the academic guidance process, and its role in shaping expectations and limiting the range of imaginable options for students is far more significant than mere individual empowerment.

Regarding the consistency of the study findings with prior research, it can be stated that family pressure, socio-economic status, and labor market conditions are key factors in field-of-study selection. Rahimi et al. (2020) identified family pressure and social expectations as obstacles to choosing a field of study. Kazemi and Nourbakhsh (2021) concluded that family economic status and expectations toward stable fields (such as medicine or engineering) were influential. Bouchard et al. (2021) indicated that labor market conditions and job opportunities are primary factors in field selection. Furthermore, Huang and Li (2022) demonstrated that field selection in public universities in Iran and the U.S. is influenced by economic and social factors.

Interpretation of the overarching theme of human enablers (including 11 basic themes organized into three organizing themes: increasing parental awareness, teacher knowledge, and counselor knowledge and skills) emphasizes the importance of the quality and effectiveness of key actors in the academic guidance network. This theme indicates that the career guidance process relies less on the student's individual capacity and more on the quality of human interactions that shape their surrounding environment:

Counselors as catalysts: The skills and knowledge of counselors show that, although they play a critical role, in this sample there are likely shortcomings in specialized tools, up-to-date counseling knowledge, or the ability to establish deep connections with students (which could activate individual enablers).

The dual role of parents: Increasing parental awareness indicates that much of the challenges stem from parental ignorance or misdirection. This area represents a key entry point for intervention, as parental knowledge directly affects environmental expectations.

Supportive role of teachers: Teacher knowledge and competencies confirm that teachers, as the first mentors after the family, should have the ability to provide early identification and guidance for students, yet limitations in this area increase the counseling burden.

Interpretation of the overarching theme of structural enablers (including 22 basic themes organized into four organizing themes: revising the academic guidance program, reforming occupational familiarity programs, utilizing technology, and assessment criteria) indicates that the educational system in Tehran is structurally and organizationally failing and requires fundamental reforms. This theme shows that the academic guidance process, instead of being a dynamic, information-based system, currently faces structural barriers:

Revising the academic guidance program: The existence of inefficient or inappropriate programs indicates that the current system cannot adequately meet individual or labor market needs.

Occupational familiarity: The need to reform occupational familiarity programs clearly shows that students have insufficient or irrelevant information about career options, hindering informed decision-making.

Technology: The use of up-to-date information technology shows that digital resources (such as informational platforms or online assessments) are not fully utilized, and the system misses opportunities for technological improvement.

Assessment and evaluation: Ineffective assessment criteria and tools indicate that evaluating choices and the effectiveness of the guidance process, from a systemic perspective, is unclear and unstandardized.

In summary, this theme shows that structural deficiencies are the main barrier to creating an effective academic guidance process in Tehran. Reforming these structures is not merely

supplementary but foundational for strengthening other enablers (individual, environmental, and human). Regarding consistency with previous research, it can be stated that Mohammadi et al. (2020) showed that the academic guidance system in Iranian schools is inefficient. Additionally, Kazemi et al. (2022) demonstrated that technology is not fully utilized in academic guidance. Johnson and Lee (2022) indicated that guidance systems in U.S. schools also require reform, and Brown et al. (2021) showed that assessment systems in academic guidance in Canada are inefficient.

Finally, based on the results of this study and considering its limitations, the following recommendations are proposed for the practical implementation of the model of drivers of academic and career guidance, in order to assist educational authorities, policymakers, and students:

Regarding the overarching theme of individual enablers, it is recommended that the Tehran Department of Education create a personal profile for each student to identify their talents and abilities and update it annually. This profile would serve as a foundation for students' field-of-study and career choices. Students should attend workshops and various companies—either systematically through the school or voluntarily—to learn about different occupations and record their experiences in their personal profiles in collaboration with school counselors.

Regarding the overarching theme of environmental enablers, it is recommended that the Ministry of Education, in collaboration with national media (IRIB), the Ministry of Culture and Islamic Guidance, and other relevant institutions, produce films, documentaries, and other media to reform perspectives on fields of study and occupations. The societal need for all fields should be clearly explained so that students and parents can make informed and relaxed choices.

Regarding the overarching theme of human enablers, it is recommended that families should actively seek knowledge about academic and career fields through reading and consulting guidance centers and provide advice to their children when needed. Appropriate training programs should also be organized for both teachers and counselors so that they can accurately convey their knowledge and information about fields of study to students.

Regarding the overarching theme of structural enablers, it is recommended that the Tehran Department of Education purchase updated software to allow the creation of comprehensive personal profiles for students that record all their capacities. Additionally, through global

applications, students should receive daily or weekly information related to occupations and fields of study to enhance their understanding.

Regarding the overarching theme of curriculum enablers, it is recommended that the Ministry of Education, in consultation with the Supreme Council of the Cultural Revolution and other relevant authorities, revise and update the overarching policies and objectives of the academic and career guidance system. Educational resources and curriculum content should be aligned with these policies to increase familiarity with fields of study and occupations. Assessment methods for guidance programs should be revised, and precise tools should be used to evaluate students' talents and interests.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by the ethics committee of Islamic Azad University. The patients/participants provided their written informed consent to participate in this study.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection, and analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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