Mitigating Gender Barriers in Albanian Vocational Education: The Impact of Psycho-Educational and Systemic Interventions

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Abstract

Although progress has been made, unequal gender-based access continues to affect vocational training programs, particularly where cultural expectations dictate choices. Rather than assuming change occurs naturally, this study examines how societal beliefs regarding gender roles influence young women's involvement in vocational education across Albania, while evaluating whether psycho-educational interventions influence participation. The findings reveal structural patterns in enrollment and offer insight into systemic barriers that policy frameworks often overlook. Female enrollment in vocational education programs remains low when rigid institutional structures and traditional gender expectations intersect. To investigate this, a mixed-methods research design was employed, combining surveys, semi-structured interviews, and a Solomon four-group quasi-experimental design. The study involved 578 students and 225 teachers from Albanian vocational schools. Because Tirana represents approximately 32.2% of the national population, the sample captures a significant share of the country's primary demographic and educational hub, enhancing overall representativeness. The findings indicate that gender norms and institutional constraints significantly limit female participation in vocational education programs. However, targeted psycho-educational interventions substantially increased the likelihood of female students considering vocational pathways; participants in the intervention groups were 1.9 times more likely to express enrollment interest. Overall participation increased markedly across the experimental groups, whereas the sole provision of labor market information produced a smaller, positive effect (23.6%). Ultimately, while vocational education systems can reproduce gendered gaps, strategic interventions can improve gender equity and support more inclusive educational pathways.

Keywords: Vocational education; Gender norms; Vocational choice; Psycho-educational interventions; Albania

1. Introduction

Vocational education (VE) plays a critical role in preparing young people for employment by providing practical skills and industry-relevant competencies that facilitate the transition from school to work. Beyond its economic function, VE contributes to social inclusion, workforce diversification, and gender equality by expanding educational and career opportunities for underrepresented groups. Increasing

female participation in vocational education is particularly important because it enhances employability, promotes economic independence, and challenges traditional gender norms that restrict occupational choices. Greater female representation in vocational pathways, especially in science, technology, engineering, and mathematics (STEM) and other technical fields, can contribute to more inclusive labor markets, reduced skills shortages, and broader socio-economic development (Robo, 2014).

Despite these benefits, gender disparities continue to characterize vocational education systems worldwide. Female students remain underrepresented in technical and traditionally male-dominated sectors such as engineering, construction, mechanics, automotive technology, and information technology. Within the European Union, women account for 41.9% of upper-secondary vocational education students; however, their participation in STEM-related vocational programs remains substantially lower (Serafini & Soares Marques, 2025). Similar patterns are evident in Albania, where vocational education enrollment continues to display strong gender segregation.

Recent national statistics indicate that although vocational education enrollment in Albania has reached a historic high, girls remain significantly underrepresented. During the 2025–2026 academic year, vocational education students accounted for 19.4% of all upper-secondary enrollments, while girls represented only 17.2% of students enrolled in vocational education programs (INSTAT, 2025). Furthermore, female participation remains concentrated in traditionally feminized fields such as tourism, business and economics, tailoring, textiles, hairdressing, and cosmetology, whereas technical disciplines including mechanics, automotive technology, electrotechnics, construction, and hydraulics continue to be dominated by male students. These disparities are often more pronounced in rural areas, where limited transportation, inadequate school infrastructure, insufficient dormitory facilities, and socio-cultural expectations create additional barriers to girls' participation.

Research suggests that educational and vocational enrollment decisions are shaped by a complex interaction of individual, social, cultural, and institutional factors. Students' interests, self-perceptions, expectations of success, and career aspirations are influenced by family attitudes, peer relationships, school environments, labor market opportunities, and prevailing social norms. Contemporary studies highlight that educational choices are socially situated and that gender stereotypes continue to influence perceptions of suitable educational pathways and occupations for women and men (Fantinelli et al., 2023; Pikić Jugović et al., 2024; OECD, 2025). Consequently, girls may be discouraged from pursuing technical and vocational fields that are traditionally associated with male employment.

Multiple barriers contribute to the underrepresentation of girls in vocational education. These include socio-cultural norms and gender stereotypes, economic constraints, limited access to information and career guidance, institutional barriers, and psychological factors such as self-efficacy, occupational aspirations, and confidence in technical abilities. To address these challenges, scholars have emphasized the importance of combining psycho-educational and systemic interventions. Psycho-educational approaches focus on strengthening students' confidence, career aspirations, and decision-making skills through mentoring, career counseling, and role-model programs. Systemic interventions seek to remove structural barriers through gender-sensitive policies, improved learning environments, financial support mechanisms, curriculum reforms, and stronger institutional commitments to equality. Evidence suggests that integrated approaches addressing both individual and structural determinants are more effective in promoting female participation and reducing gender segregation in vocational education.

Although previous studies have documented barriers to girls' participation in vocational education, important knowledge gaps remain in the Albanian context. Existing research has focused primarily on enrollment patterns and descriptive analyses, with limited attention to the interaction of socio-cultural, infrastructural, psychological, and institutional factors that influence girls' participation. Furthermore, evidence regarding the effectiveness of psycho-educational and systemic interventions in improving gender equity within Albanian vocational education remains scarce.

This study addresses these gaps by examining the factors that influence girls' participation in vocational education in Albania and by assessing the potential contribution of psycho-educational and systemic interventions to promoting gender equity. By identifying context-specific barriers and

opportunities, the study aims to inform educational policy, support evidence-based intervention strategies, and contribute to the development of more inclusive vocational education pathways for girls and young women.

2. Literature Review

Research consistently identifies multiple factors that discourage girls' participation in vocational education (VE), including gender stereotypes, limited self-efficacy, occupational segregation, and the underrepresentation of women in technical and STEM-related fields. While earlier studies highlighted cultural norms, family expectations, and institutional barriers as key determinants of participation (Evans, 1995; Aina, 2006; Hubert, 2006), recent evidence suggests that these factors continue to shape educational choices despite policy efforts to promote gender equality. According to the OECD (2023), gendered perceptions of occupations, unequal access to apprenticeships, and persistent labor market segregation remain significant barriers to female participation in vocational pathways. Similarly, UNESCO (2022) emphasizes that social norms and structural inequalities continue to restrict girls' access to technical and vocational education and training (TVET), particularly in emerging sectors linked to digitalization and the green economy.

Within vocational education systems, gender disparities remain pronounced across Europe. Recent data from the European Centre for the Development of Vocational Training indicate that women account for 41.9% of upper-secondary VET students in the European Union but represent only 15.5% of students enrolled in STEM-oriented vocational programs (Serafini & Soares Marques, 2025). These disparities reflect the persistence of occupational stereotyping, limited female role models in technical fields, and insufficiently developed career guidance systems. Consequently, educational choices remain highly gendered, reinforcing occupational segregation and restricting women's access to higher-paying technical professions (OECD, 2023; CEDEFOP, 2025).

A wide range of factors influences students' selection of vocational education pathways. Individual determinants include academic achievement, self-concept, self-efficacy, career interests, educational aspirations, and perceptions of occupational suitability. Recent research suggests that students' educational choices are shaped by their expectations of success, perceived value of different educational options, and confidence in their abilities, all of which interact with broader social and contextual influences (Fantinelli et al., 2023; Lazarides & Lauermann, 2019). Social and environmental influences include family background, parental education, peer networks, role models, access to information, and socio-economic conditions. Contemporary studies show that family expectations, social norms, school experiences, and access to career guidance significantly influence students' educational decisions, often reinforcing gendered patterns of participation in vocational education (Xhafa & Branković, 2020; Fantinelli et al., 2023; OECD, 2023; Pikić Jugović et al., 2024). Recent studies further emphasize the importance of school climate, career guidance services, and labor market expectations in shaping educational decisions, particularly among girls considering non-traditional vocational careers (OECD, 2023; Serafini & Soares Marques, 2025).

In Albania, gender imbalances in vocational education remain particularly pronounced. According to the Institute of Statistics, vocational education continues to attract a relatively small share of students in Albania. In the 2025–2026 academic year, only 19.4% of all students were enrolled in vocational education programs, and girls accounted for just 17.2% of vocational education enrollments, highlighting the persistent gender imbalance in this educational pathway (Institute of Statistics, 2025) substantially below the European Union average of 41.9%. Gender disparities in vocational education remain evident despite recent efforts to promote greater participation of girls. Female enrollment continues to be concentrated in traditionally feminized fields, including tourism, business and economics, social services, textiles, tailoring, hairdressing, and cosmetology.

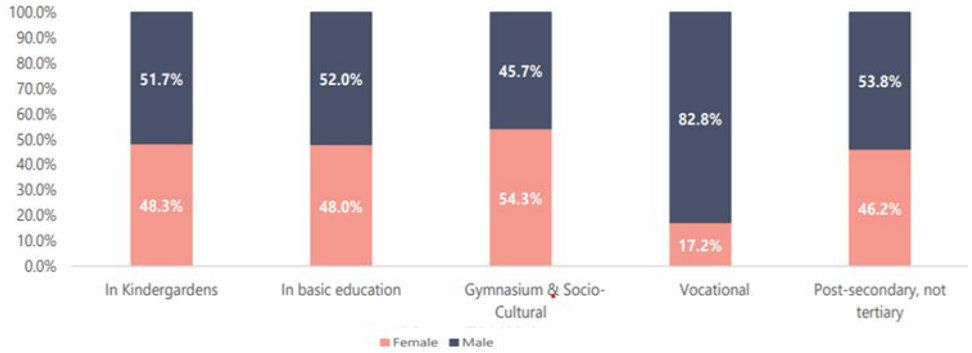

Figure 2. Enrolled pupils and students by sex and level of education, 2025-2026
Source: INSTAT - Enrollment statistics in education 2024 - 2025

In contrast, technical and industrial disciplines such as mechanics, automotive technology, electrical engineering, construction, plumbing, and hydraulics remain predominantly male-dominated. Research suggests that persistent gender stereotypes, occupational segregation, limited female role models in technical professions, and socially constructed expectations regarding appropriate career paths for women and men continue to shape educational choices and reinforce gendered patterns of participation in vocational education (UN Women, 2021; Xhafa & Branković, 2020). These disparities are reinforced by infrastructural limitations, geographic inequalities, gender stereotypes, and limited exposure to technical career pathways, particularly in rural areas.

Recent research suggests that increasing female participation in vocational education requires a combination of psycho-educational and systemic interventions. Psycho-educational approaches focus on strengthening self-confidence, career aspirations, and resilience through mentoring, career counseling, and exposure to female role models in non-traditional occupations. Systemic interventions seek to address structural barriers through gender-responsive policies, curriculum reform, financial incentives, improved learning environments, and stronger links between education and labor market opportunities (UNESCO, 2022; CEDEFOP, 2025). Evidence indicates that integrated approaches addressing both individual and institutional factors are most effective in improving female enrollment, retention, and completion rates while promoting broader outcomes related to gender equality, economic inclusion, and social empowerment (OECD, 2023; Serafini & Soares Marques, 2025).

As illustrated in the conceptual framework of female participation in vocational education (Figure 3), educational and vocational enrollment decisions are influenced by a complex interplay of individual, social, cultural, and institutional factors. Students' interests, self-perceptions, expectations of success, and career aspirations are shaped by family attitudes, peer relationships, school experiences, and perceptions of labor market opportunities. These factors operate within broader social and cultural contexts where gender norms, stereotypes, and expectations continue to influence how young people perceive different educational pathways and occupational fields. Contemporary research highlights that educational choices are socially situated and that gendered beliefs about abilities, interests, and future careers remain important determinants of participation in specific areas of study, particularly in vocational and technical education (Fantinelli et al., 2023; OECD, 2025); Serafini & Soares Marques, 2025).

Gender strongly influences VE enrollment in Albania, where male students dominate: in 2010, males represented 67% of VE enrollment nationwide, with the gender gap evident across all districts; for instance, in Tirana, only 17.5% of vocational education students were female (MASH, 2010). Female enrollment remains critically low—18% in general vocational schools and 39% in professional training programs—far below EU averages of 44%. Enrollment patterns are highly gendered, with girls predominantly pursuing fields such as tourism, economics, business, hairdressing, and tailoring, while

male-dominated fields such as mechanics, electrical work, automotive technology, and hydraulics often have no female participants. Gender disparities in vocational education are often more pronounced in rural and socio-economically disadvantaged regions, where limited transportation, insufficient educational infrastructure, restricted access to student support services, and persistent gender norms create additional obstacles to girls' participation. Such structural and socio-cultural barriers continue to influence educational choices and contribute to the underrepresentation of girls in technical vocational pathways (Xhafa & Branković, 2020; UN Women, 2021; UNESCO, 2022). Outdated school infrastructure, unsafe workshop environments, low academic preparation, and lack of career guidance further exacerbate these barriers, highlighting systemic, cultural, and infrastructural challenges.

Psycho-educational and systemic interventions have been proposed and implemented to address these persistent barriers. Psycho-educational programs focus on enhancing girls' self-efficacy, career aspirations, and resilience through targeted guidance, mentorship, and skill-building initiatives. Psycho-educational interventions commonly include career guidance, mentoring, leadership and life-skills development, confidence-building activities, and exposure to female role models in technical and STEM-related professions. Evidence suggests that these approaches can enhance girls' educational aspirations, increase self-confidence in non-traditional fields, and support more gender-equitable educational choices (Fantinelli et al., 2023; Pikić Jugović et al., 2024; UNESCO, 2022). By fostering personal agency and challenging internalized gender norms, such interventions aim to empower girls to pursue vocational and technical pathways traditionally dominated by males. Systemic interventions focus on institutional and structural reforms to create more equitable opportunities for girls, including policy reforms for gender equity, curriculum adjustments to encourage inclusion, female-friendly learning environments, financial support (scholarships and grants), and programs promoting work-based learning in non-traditional sectors. Efforts to increase female representation among teaching staff, strengthen gender-sensitive school environments, expand financial and social support mechanisms, and implement inclusive admission and retention policies aim to reduce structural barriers that disproportionately affect girls' participation in vocational education (UNESCO, 2022; OECD, 2023; Council of Europe, 2024).

Research indicates that combining psycho-educational and systemic interventions produces the most significant impact, simultaneously enhancing girls' skills, confidence, and aspirations while reforming institutional structures and policies. Research indicates that combining psycho-educational and systemic interventions produces the most significant impact, simultaneously enhancing girls' skills, confidence, and aspirations while reforming institutional structures and policies. These interventions contribute to higher enrollment, retention, and completion rates in vocational education programs and support long-term economic and social empowerment, fostering equitable participation in male-dominated sectors and promoting broader societal benefits such as gender equality, economic competitiveness, and social inclusion (UNESCO, 2022; OECD, 2023; CEDEFOP, 2025).

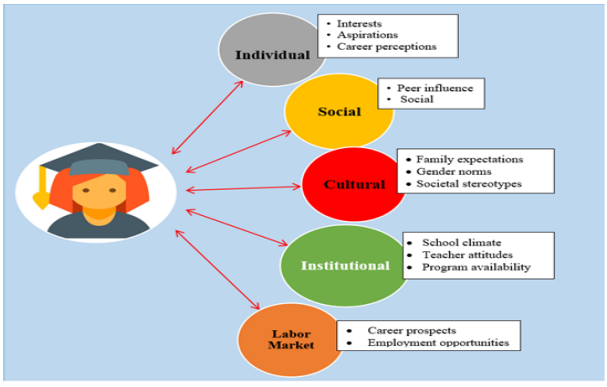

Figure 3. Conceptual framework of female participation in Vocational Education

3. Methodology

3.1 Study Design

This study employed a mixed-methods approach, integrating quantitative and qualitative techniques, including structured questionnaires, semi-structured interviews, focus groups, and a quasi-experimental design. This methodology enables a comprehensive examination of the factors influencing female participation in vocational education in Albania. The Solomon four-group quasi-experimental design (Solomon, 1949; Shuttleworth, 2009) allows for causal inference while controlling for pretest effects, and the mixed-methods framework facilitates both statistical analysis and nuanced contextual understanding of institutional, social, and gender-specific dynamics.

3.2 Sample Sources

The study sample comprised 578 students (57% female) and 225 teachers (71% female), randomly drawn from a defined population (N = 4,116) using the sample size determination framework of Krejcie and Morgan (1970), at a 95% confidence level ($p < .05$).

Considering that Tirana represents approximately 32.2% of the national population, the sample reflects a substantial share of the country's main demographic and educational hub, thereby enhancing its representativeness. The sampling frame was developed using multiple official sources, including the Ministry of Education Statistical Yearbook, Tirana Regional Education Directorate school registries, municipal administrative data, and INSTAT national statistics.

Tirana was selected as the quasi-experimental site due to its educational and demographic significance, accounting for approximately 26% of upper secondary students, 27% of basic education students, and 30% of vocational education students in Albania. Within this context, four public basic education schools were selected through random sampling from a total of 40 schools in Tirana to ensure socio-demographic diversity, including variation in migration background, regional origin, and socioeconomic composition. The selected schools differed in community profiles, including one located in the northwestern part of Tirana serving predominantly post-1990 migrant families from northeastern Albania; a second situated in administrative unit 8 reflecting a mixed population of long-term residents and internal migrants; a third located near the city centre with a heterogeneous population of native residents and migrants primarily from southern and southeastern Albania; and a fourth characterized by a highly diverse student body, including a relatively higher proportion of Roma students and families from lower socioeconomic backgrounds.

In parallel, two public ICT vocational schools were purposively selected based on above-average performance and implementation of dual-system ICT programmes. One institution is located in Tirana and the other in Shkodër, situated in northern Albania. Both institutions operate with expertise and support from Austria and Germany in implementing dual education models aimed at increasing female participation in ICT fields.

A Solomon four-group design was employed to control for pre-test effects and strengthen internal validity. Participants were randomly assigned to four groups (pre-test–post-test, post-test-only, and corresponding control groups), enabling the isolation of intervention effects while accounting for testing bias (Dan Navarro & Sidney Siegel, 2018).

The intervention consisted of gender equality workshops for teachers and students, combined with structured visits to ICT vocational schools to observe curricula, learning environments, and dual-system partnerships.

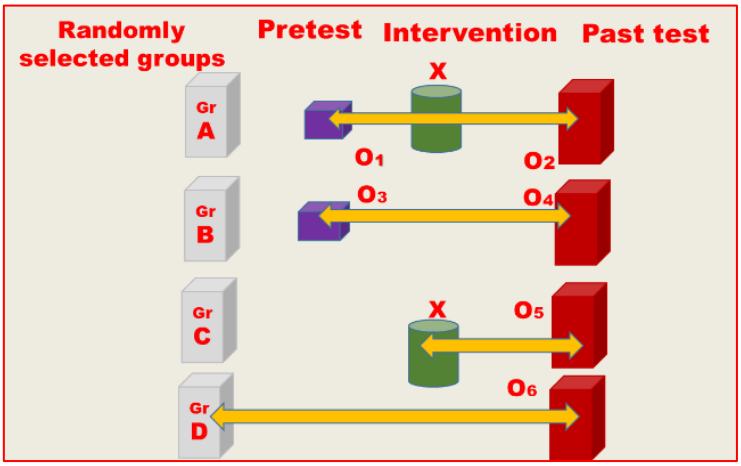

Figure 4. Solomon's 4-group model

3.3 Data Collection Instruments

Four primary questionnaires were developed based on validated instruments in educational research, integrating the OECD/EDU model for vocational education policy evaluation (OECD, 2018), social inclusion indicators (Atkinson et al., 2002), and the Pearson Schoolwide Improvement Model (SIM). This ensured comprehensive coverage of policy-relevant outcomes, equity, institutional effectiveness, and systemic impacts. Questionnaires were validated by three Albanian and two Austrian experts and pilot-tested prior to full administration. The questionnaires aimed to collect data on the barriers to the social inclusion of females, particularly in relation to gender stereotypes, culture and traditions, lack of information, the influence of family, school, and peers, the climate of social inclusion in schools, career guidance in lower secondary schools, gender roles, gender equality policies, etc. An overview of the survey instruments employed in this study is provided in Table 1, delineating the respective participant groups, item structures, and the specific research objectives underpinning each questionnaire. The tools were designed to capture both structural and psychosocial determinants of girls' participation in vocational education, facilitating a comprehensive mixed-methods analysis.

Table 1. Overview of Questionnaires: Participants, Content, and Objectives

Questionnaire	Participants	Sections	Items	Purpose
Q1	ICT teachers	6	72	Assess teacher perceptions of female participation, school climate, and policies
Q2	ICT students	5	72	Assess student reasons for school choice, participation attitudes, and school climate
Q3	9-year students	5	48	Pre/posttest to measure career guidance, female participation, and school climate
Q4	9-year teachers	4	53	Pre/posttest to measure career guidance, school climate, and perceptions of female participation

Questionnaire No. 1—administered to staff of the ICT vocational upper secondary school—is structured into six sections and comprises 72 items, measured using a five-point Likert scale (Strongly disagree, Disagree, Somewhat agree, Agree, Strongly agree). Teaching staff responded to questions covering:

1. General background information;

2. Their perceptions of the reasons why students choose vocational education, based on their professional experience and interactions with students and parents;
3. Their perceptions of the reasons why girls do not choose vocational education, again drawing on their experience and engagement with students and parents;
4. Their attitudes toward girls' participation in technical vocational education;
5. Their perceptions of the overall school climate;
6. Information on whether the school has a formal plan and implements activities related to social inclusion.

Questionnaire No. 2—administered to students of the ICT vocational upper secondary school—is organized into five sections and comprises 72 items, measured using a five-point Likert scale (Strongly disagree, Disagree, Somewhat agree, Agree, Strongly agree). Students responded to questions related to:

1. General background information;
2. The reasons for choosing vocational education;
3. Their perceptions of why girls do not choose vocational education;
4. Their attitudes toward girls' participation in technical vocational education;
5. Their perceptions of the school climate.

Questionnaire No. 3—administered to lower secondary school students (grades 1–9)—addresses issues related to career guidance and the participation of girls in technical professions. This instrument was used as both a pre-test and post-test within the quasi- experimental design implemented with participating schools. It is structured into five sections and includes a total of 48 items:

1. General background information;
2. Career guidance;
3. Girls' participation in technical professions;
4. The climate of social inclusion in school;
5. Additional opinions.

Questionnaire No. 4—administered to lower secondary school staff—focuses on career guidance and girls' participation in technical professions. This questionnaire also served as a pre-test and post-test within the quasi-experimental design conducted with teachers in the participating schools. It is organized into four sections and comprises 53 items:

1. General background information;
2. Career guidance;
3. Girls' participation in technical professions;
4. The climate of social inclusion in school.

In addition, key stakeholders—including policymakers, vocational education experts, employer representatives, and labor union members—participated in semi-structured interviews and focus groups, providing nuanced insights into policy formulation, female participation, and social inclusion in the Albanian VET system. At the national level, a substantial number of key stakeholders were interviewed, with a total of 10 interviews conducted, reflecting the highly centralised nature of the vocational education and training system. The participants involved in the national-level focus group differed from those included in the local-level focus groups.

To rigorously evaluate the effectiveness of targeted interventions, the study adopted an quasi-experimental Solomon four-group design (Solomon, 1949; Shuttleworth, 2009) as illustrated in Table 2. The Solomon four-group design is a standard quasi-experimental framework consisting of a pre-test–post-test design for two groups, alongside a post-test-only design for the control group. This method enables the researcher to draw a random sample from the population without necessarily assigning individual cases randomly to comparison groups. The quasi-experimental approach was considered appropriate for this study, as participants (students and teachers) were not randomly assigned to quasi-experimental and control groups. Instead, the researcher worked with intact classes and existing teaching staff, without any manipulation of group composition. According to Shuttleworth (2009), this design allows the researcher a high degree of control over variables and helps to account

for the potential influence of pre-testing and post-testing on outcomes.

Random assignment of schools to quasi-experimental and control groups helped to reduce selection bias and control for maturation effects. Furthermore, to address potential interaction between selection and instrumentation, the research instruments were administered under standardized conditions across all participating schools.

The quasi-experimental structure included: quasi-experimental Group I (A), Control Group I (B), quasi-experimental Group II (C), and Control Group II (D), with O_1 and O_3 representing pretests, O_2, O_4, O_5, and O_6 representing posttests, and X denoting the intervention. The effects were analyzed as follows: independent variable effect ($O_2 - O_4$; $O_5 - O_6$), pretest effect ($O_4 - O_6$), pretest–measurement interaction effect ($O_2 - O_5$), and random assignment effect ($O_1 - O_3$).

Table 2. Quasi-experimental Design and Assessment Schedule

Group	Pretest	Intervention	Posttest
I (Quasi-experimental)	O1	X	O2
II (Control)	O3	–	O4
III (Quasi-experimental)	–	X	O5
IV (Control)	–	–	O6

Group I served as the experimental group (A), which was subjected to a pre-test (O1), the intervention (X), and a post-test (O2). Group II functioned as the control group (B), which completed a pre-test (O3) and a post-test (O4), without receiving any intervention. Group III represented an additional experimental group (C), which was exposed to the intervention (X) and subsequently completed a post-test (O5), but did not undertake a pre-test. Group IV constituted an additional control group (D), which completed only a post-test (O6). Accordingly, Groups I and III were exposed to the intervention, whereas Groups II and IV were not, and their outcomes were not influenced by it.

The intervention aimed to achieve the development of a school culture more sensitive to gender equality issues, as well as the effective implementation of awareness-raising measures regarding girls' participation in technical professions. To achieve these objectives, the intervention included a series of structured activities. Four seminar and workshop sessions were conducted with students and teachers from Groups A and C, with participants in Group A attending the training after completing the pre-test questionnaire, while those in Group C had not undertaken a pre-test. These training sessions focused on the identification of factors influencing gender equality and the low participation of females in vocational education, particularly in technical and technological fields, the use of evaluation and action-planning tools in schools, the development of social inclusion plans with a specific focus on gender equality, and the discussion of policy approaches aimed at making vocational education high-quality, safe, and attractive for girls. In addition, the intervention included the organization of open days at ICT vocational schools involving students and teachers from lower secondary schools. Participants from Groups A and C visited the vocational upper secondary schools included in the study, where they were introduced to learning and practical training environments, curricula, teaching staff, and first-year students who had recently enrolled. Particular emphasis was placed on interactions with business representatives supporting these schools, where dual education programs based on the German model are implemented. The activities also incorporated video materials showcasing students' experiences—particularly those of girls—in these schools, as well as in partner schools in Austria.

Following the completion of the intervention, all four groups were administered the post-test. Pre-test and post-test results were recorded to generate data for analysis. The data were analyzed using descriptive statistics, processed with SPSS software.

By combining structured survey data, qualitative perspectives, and a quasi-experimental framework, the study adopted a mixed-methods approach that allowed measurement of policy outcomes while elucidating the social, institutional, and gender-specific mechanisms influencing VET enrollment.

4. Data Processing and Analysis

A critical stage in preparing data for analysis is data cleaning, which involves identifying, correcting, and managing errors, inconsistencies, missing values, duplicates, and other anomalies that may compromise the accuracy and reliability of research findings. Contemporary research methods literature emphasizes that data cleaning is an essential component of ensuring data quality and producing valid and reproducible results (Creswell & Creswell, 2023; Mertens, 2024). The process includes screening datasets for completeness, accuracy, consistency, timeliness, and relevance before statistical analysis is undertaken.

Data quality is commonly assessed through several dimensions, including accuracy, completeness, consistency, uniqueness, and validity. Ensuring these dimensions requires systematic procedures for reviewing, diagnosing, documenting, and addressing data-related issues throughout the research process. Consequently, data cleaning is not a single activity but an iterative process that supports the integrity and trustworthiness of quantitative and qualitative analyses (Mertens, 2024; Tashakkori & Teddlie, 2021).

In this study, appropriate data management and quality assurance procedures were applied prior to analysis. Survey responses were reviewed for completeness and consistency, coded according to predefined protocols, and prepared for statistical processing. Qualitative responses were converted into numerical categories where required to facilitate quantitative analysis. Following cleaning and coding, the dataset was entered into the Statistical Package for the Social Sciences (SPSS) for descriptive and inferential statistical analysis. These procedures contributed to enhancing the reliability, validity, and overall quality of the study findings (Creswell & Creswell, 2023; Mertens, 2024). To identify latent constructs and reduce dimensionality, principal component analysis (PCA) was employed. Two complementary procedures were applied: a theory-driven factor approach based on survey objectives and a confirmatory factor framework, and an exploratory factor analysis (EFA) to assess empirical robustness. Ten explanatory factors were derived, including family influence, tradition and societal norms, student and family information, labor market factors, school environment, perceived vocational school infrastructure, student aptitudes, economic factors, gender role models, and levels of social inclusion and equity. Varimax rotation was applied to the correlation matrix to estimate factor loadings. Gender and quasi- experimental group assignment were included to assess the impact of supportive programs on female participation. Model stability was assessed via bootstrap resampling with 1,000 iterations (Efron & Tibshirani, 1993).

Binary regression models were employed to examine the influence of these factors on overall vocational education participation, determinants of girls' enrollment, and effects of supportive policies. The dependent variable was coded as: general secondary school = 0, vocational secondary school = 1. The probability of selecting vocational education was estimated using:

$$\pi = Pr\,(Y = 1|X = x) \quad (1)$$

$$\pi_i = Pr\,(Y_i = 1|\, X_i = x_i) = \exp\,(ß_0 + ß_1\, x_i)\, /1 + \exp\,(ß0 + ß_1\, x_i) \quad (2)$$

Assuming normally distributed data, probabilities were estimated with Generalized Least Squares (GLS) incorporating the explanatory variables.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.582, exceeding the 0.5 threshold and confirming suitability for factor analysis. Bartlett's test of sphericity was statistically significant, indicating sufficient intercorrelations among variables (Table 3). These results validated the appropriateness of the data for factor extraction.

Table 3. Sampling Adequacy and Sphericity: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.582
Bartlett's Test of Sphericity	Approx. Chi-Square	7949.743
	df	3916
	Sig.	.000

Data were cleaned and coded for accuracy, completeness, uniqueness, timeliness, and consistency (Johnson & Dasu, 2004; Wu, 2013). Quantitative data were analyzed using SPSS, while qualitative data from interviews and focus groups were coded thematically.

5. Ethical Considerations

The study rigorously adhered to ethical standards throughout its design and implementation. Approval was obtained from the relevant institutional review board, ensuring compliance with national and international guidelines for research involving human participants. Informed consent was secured from all participants, including students, teachers, and key stakeholders, with parental or guardian consent obtained for minors. Participation was voluntary, and respondents could withdraw at any stage without penalty.

Confidentiality and anonymity were strictly maintained, with all data de-identified and securely stored. Measures were taken to minimize potential psychological or social risks, particularly in discussions of gender stereotypes and socio-cultural barriers. The study also upheld principles of cultural sensitivity and inclusivity, ensuring that instruments and procedures were appropriate for the local context. Findings were reported in aggregate form to protect participant identities, thereby ensuring the research upheld ethical integrity while generating meaningful insights into female participation in vocational education.

6. Limitations and Future Research

While this study provides valuable insights into factors influencing female participation in vocational education in Albania, several limitations should be acknowledged. Although the quasi- experimental design controlled for pretest effects, it relied on existing class assignments rather than individual randomization, which may constrain the generalizability of causal inferences. The study was conducted in Tirana, where approximately 80% of Albania's population resides, and more than half of pre-university students and over 70% of teachers are located. In the peripheral areas of the city, the population represents all regions of Albania, encompassing diverse cultural, economic, and educational backgrounds, with many residents facing challenges related to social and economic marginalization. The selected schools were geographically distributed across both the city center and the suburbs, capturing substantial diversity. Nonetheless, findings may not fully reflect conditions in other regions of Albania, particularly remote or underrepresented areas with distinct socio-cultural norms, institutional practices, and labour market contexts.

Self-reported measures of gender stereotypes, family influence, and social inclusion may also be subject to social desirability bias, despite safeguards for anonymity and confidentiality. Furthermore, the cross-sectional and quasi-experimental design precludes assessment of long-term outcomes, including sustained impacts on female empowerment, career trajectories, and labour market integration.

Future research should adopt multi-site, longitudinal designs, incorporate individual-level randomization where feasible, and integrate objective outcome measures, such as skill acquisition, employment indicators, and earnings potential, to strengthen external validity. Such approaches would provide a more comprehensive understanding of the mechanisms shaping girls' participation in vocational education and inform the development of targeted, gender-responsive policies.

7. Reliability and Validity

Reliability and validity constitute fundamental pillars of rigorous research design. While reliability ensures the consistency and reproducibility of findings across time and contexts, validity safeguards the extent to which the study accurately measures what it intends to measure. In this study, both dimensions were addressed through careful methodological choices, including instrument validation, expert review, piloting procedures, and the application of standardized data collection protocols.

Overall, these procedures enhance the reliability, validity, and trustworthiness of the findings and are consistent with contemporary standards for mixed-methods and quasi-experimental educational research (Creswell & Creswell, 2023; Mertens, 2024; Tashakkori & Teddlie, 2021)

8. Findings

8.1 Findings from the questionnaires

Findings derived from the data collected through questionnaires provide a systematic overview of respondents' views, experiences, and patterns of response relevant to the study objectives. The analysis of the questionnaire data enables the identification of key trends, relationships, and variations within the sample, thereby offering empirical insights into the research questions under investigation. These findings form the basis for interpretation and discussion in relation to the existing literature and the conceptual framework guiding the study. The questionnaire entitled "Factors Influencing the Social Inclusion of Girls in Vocational Education (ICT)" was administered to both teachers and students from lower secondary schools and ICT-oriented upper secondary vocational schools included in the study.

In the questionnaire administered to lower secondary school students, perceptions regarding girls' participation in technical vocational education were examined through ten Likert-scale items designed to capture attitudes across a continuum of agreement and disagreement. This measurement approach enabled a systematic assessment of students' views on gender equality, stereotypes, and perceived capabilities within vocational and technical fields. Overall, findings indicate strong support for gender equality in vocational education. A total of 41% of respondents strongly agreed and 33% agreed that girls can attend vocational schools on an equal basis with boys. Similarly, perceptions of equal ability in technical professions were largely positive, with 21% strongly agreeing, 24% agreeing, and 28% somewhat agreeing, while the remainder expressed disagreement to varying degrees.

Gender stereotypes were widely rejected. The majority of students disagreed with the notion that girls are unsuited for technical professions (41% strongly disagree; only 6% agree) and with the idea that girls should not attend vocational schools (56% disagreement overall). Traditional occupational stereotypes assigning "hard" jobs to boys and "light" jobs to girls also received low agreement (11%) and high levels of disagreement. Perceptions of girls' technical abilities showed a more mixed distribution, with responses spread across agreement and disagreement categories. In contrast, views on girls' performance in science subjects were predominantly positive, as 54% strongly disagreed that girls are less capable than boys. Family influence was generally not perceived as a major barrier, with 43% disagreeing that families restrict girls' access to vocational education. However, 49% indicated partial agreement, suggesting some residual influence. Regarding factors contributing to low female participation in vocational education, students identified girls' lack of interest (67%) as the main factor, followed by family barriers (34%), shyness (28%), gender discrimination (26%), safety concerns (21%), cultural norms (20%), and limited awareness (16%). Additional factors included logistical constraints, inadequate school conditions, weak promotion of vocational education, economic limitations, and insufficient career guidance. Vocational education is perceived as more costly than general education (5%). Finally, lack of career counselling in basic education schools was also identified (8%).

The questionnaire for students in ICT vocational upper secondary schools was completed by 142 students, of whom 60.1% were female and 39.9% male. The instrument was designed to collect data aimed at providing an overview of students' experiences and the school climate within these institutions, as well as to understand the reasons behind their choice of vocational education and the factors influencing that decision. Both female and male students expressed their views regarding the inclusion of girls in technical professions. Mentality and gender typologies, deeply rooted over time and to some extent embedded in tradition, culture, and everyday social practices, also constitute significant barriers to the inclusion of females in vocational education. In the fourth section of the questionnaire, a set of 12 items was designed to collect data on students' attitudes towards the participation of females in vocational education. A comparative gender analysis shows no substantial differences between male

and female students in relation to the first three factors. However, notable variation emerges in relation to gendered division of labour, where girls demonstrate lower agreement (mean score 1.9) compared to boys (2.6). Similarly, girls appear more hesitant regarding equal participation in vocational education (mean score 1.8) compared to boys (2.1). Both groups share the view that participation in vocational education would ensure secure employment for girls. At the same time, girls, slightly more than boys, tend to perceive vocational education as less suitable for them.

The questionnaire for teachers in vocational schools had the same structure and content as that administered to students. It was completed by 70 members of the teaching staff from the two vocational upper secondary schools included in the study, of whom 95.7% were teachers and approximately 4% were school leaders. The instrument aimed to collect data on barriers to female participation in vocational education, based on teachers' professional experience and their interaction with students and parents. Unlike students, teachers identified the economic dimension as the primary barrier to girls' participation in vocational education, perceiving vocational schooling as being associated with higher costs compared to general education. The vocational curriculum was also not considered fully adequate for promoting female social inclusion and was identified as the second most significant constraining factor. According to the interviewed teachers, additional barriers include wage and labour market discrimination on one hand, and, on the other, the persistence of traditional norms, gender typologies, family influence, and limited promotion of vocational education. Collectively, these factors are perceived as having a substantial impact on the underrepresentation.

The questionnaire for staff in lower secondary schools collected data on teachers' perceptions regarding students' career orientation, girls' participation in technical professions, and the overall climate of social inclusion within schools. It was completed by 156 teachers from the four schools included in the study, of whom 78.2% were female and 21.8% male. In relation to attitudes towards girls' participation in technical vocational education, teachers generally expressed positive views. They acknowledged that girls can attend vocational schools (mean score: 3.70) and that they are equally capable as boys in technical professions (mean score: 3.49). However, teachers also highlighted that girls continue to face barriers primarily stemming from family influence (mean score: 3.26), which remains a constraining factor in their participation in vocational pathways of females in vocational education. The data clearly highlight a combination of social, cultural, and institutional factors influencing the low participation of girls in technical vocational schools. The most dominant factor is "family barriers (beliefs, customs, traditions, etc.)" (63.5%), indicating that decisions regarding girls' enrollment in vocational education are strongly shaped by traditional gender norms and family expectations. Similarly, a high percentage of respondents (56.4%) point to the indifference of girls themselves, which may reflect limited exposure to career information, insufficient guidance, or internalized gender stereotypes. At a secondary level of influence, lack of publicity about technical professions (39.7%) suggests that vocational pathways are not effectively promoted as attractive or viable options for girls. In addition, logistical barriers (26.9%) and career counseling in lower secondary schools (21.2%) indicate structural gaps in access and early educational guidance that may discourage participation. Other factors such as and limited labor market demand (10.3%) appear to have a more moderate influence but still contribute when combined with broader structural issues. Financial constraints (5.8%) and the perception that vocational education is more expensive than general education (6.4%) are relatively minor factors. Only 7.7% of respondents believe that vocational schools themselves do not make sufficient efforts to attract girls. Overall, the findings suggest that the underrepresentation of girls in vocational education is not caused by a single factor, but rather by an interplay of strong cultural expectations, limited career guidance, insufficient promotion of technical fields, and practical access barriers.

8.2 Findings from the Quasi-Experimental Study

The quasi-experiment aimed to test whether a psycho-educational intervention could reduce barriers to female participation in vocational education and training (VET). Survey data from lower secondary school students were used to assess the impact of the intervention and promotional activities on

students' intention to enroll in VET programs. Out of 435 observations, 102 students reported that they would choose vocational education, indicating a moderate overall level of interest following the intervention. The results strongly confirm the importance of labor market signals in students' educational decision-making. In both analytical models, the labor market emerged as the dominant factor, with positive job market signals increasing the likelihood of choosing VET by approximately 23%. Students' skills and personal aptitudes also play a significant role in shaping educational choices. When students perceive their abilities as better aligned with vocational professions, the probability of selecting VET increases by around 5%, highlighting the importance of self-assessment and perceived competence. Social influences were found to be highly significant. Society and peer environment appear to have a stronger effect than family influence. When vocational education becomes more common within a peer group or local community, students are more likely to follow the same path. Similarly, exposure to social role models and local traditions supporting vocational pathways positively affects students' decisions. However, gender stereotypes and prototypes continue to act as barriers, limiting girls' participation in particular. Perceptions of inclusion and gender equality in education also matter. When students perceive schools as fair and inclusive, their likelihood of participating in vocational education increases slightly (by about 0.5 percentage points). Despite this positive effect, perceived discrimination remains a key limiting factor, particularly for girls. Overall, the findings suggest that while general promotional policies for VET have a positive effect, their impact is relatively weak unless they are specifically targeted. The quasi-experimental intervention demonstrates that targeted promotional activities aimed at girls significantly strengthen outcomes, increasing the likelihood of female participation in vocational education by approximately 1.9 times, holding other factors constant. Follow-up tracking of students after the start of the school year confirmed the robustness of these results. Participation rates in schools included in the experiment were approximately 7 times higher than in control schools, while girls' participation was nearly twice as high, demonstrating a clear positive effect of the intervention compared to non-treated groups.

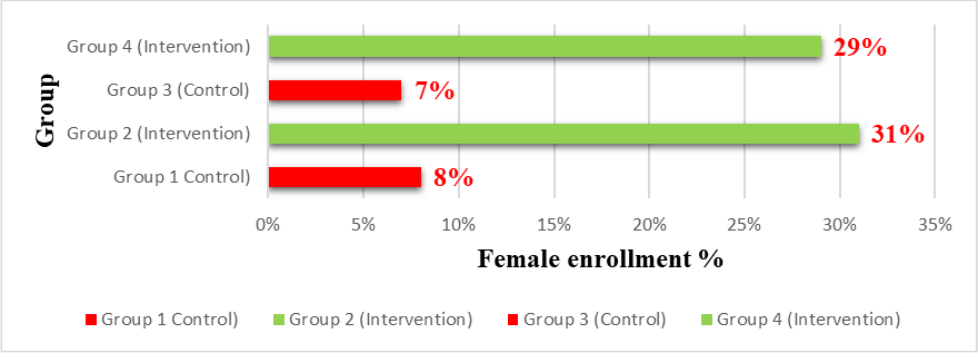

Figure 5. Effect of psycho-educational and systemic interventions on girls' vocational education enrollment in Albania

9. Discussion

Expanding girls' access to vocational education therefore has multiple, interlinked benefits. It enhances educational attainment, improves future employment prospects and earnings potential, and fosters empowerment through increased social and economic inclusion. Vocational education functions not merely as a training pathway but as a transformative institutional mechanism capable of mitigating gendered labour market inequality, challenging occupational segregation, and promoting equitable participation in the workforce.

Analysis of the survey data revealed notable gender disparities in vocational education

enrollment. Of the 578 students sampled, 57% were female, yet female participation in vocational education remained consistently lower than male counterparts, particularly in ICT-focused institutions. Descriptive analyses of teacher and student responses highlighted variation in perceptions of female participation. Teachers reported a moderately supportive school climate (mean = 3.42, SD = 0.61), while students indicated that family influence and information levels significantly shaped their school choices. Qualitative data from interviews and focus groups confirmed that parental guidance, local labor market signals, and gendered role expectations act as key determinants of enrollment patterns.

9.1 Factor Analysis of Influences on Vocational Enrollment

Principal component analysis (PCA) and exploratory factor analysis (EFA) identified ten latent factors explaining participation in vocational education. These included: family influence, socio-cultural norms, labor market expectations, school environment, vocational school infrastructure, student aptitudes, economic constraints, gender role models, social inclusion, and equity. Factor loadings ranged from 0.45 to 0.81, indicating robust construct validity. The factor solution accounted for 68% of total variance, demonstrating that the selected variables captured the primary influences on enrollment decisions.

Exploratory factor analysis confirmed the stability of these constructs across gender and quasi-experimental conditions. Bootstrap resampling with 1,000 iterations showed consistent factor loadings, indicating high model reliability and generalizability. Gender and intervention assignment were significant moderators, particularly influencing the strength of family and socio-cultural factors on female enrollment.

9.2 Impact of quasi- experimental intervention

The Solomon four-group quasi- experimental design allowed robust estimation of intervention effects. Participation in intervention schools was seven times higher than in matched control schools, and female participation nearly doubled, demonstrating the effectiveness of community-informed, gender-sensitive interventions.

Regression analyses quantified these effects. Binary logistic regression revealed that labor market information ($\beta = 0.42$, $p < .001$) and exposure to gender-equity workshops ($\beta = 0.37$, $p < .01$) were the strongest positive predictors of female enrollment in vocational education. Conversely, gendered role models ($\beta = -0.28$, $p < .05$) and perceptions of exclusion ($\beta = -0.31$, $p < .01$) significantly reduced the probability of participation. These results confirm that both structural and psychosocial factors critically shape enrollment decisions.

$\pi_i = \Pr(Y_i = 1 | X_i = x_i) = \exp(ß_0 + ß_1 x_i) / 1 + \exp(ß0 + ß_1 x_i)$

The model achieved satisfactory fit (Nagelkerke $R^2 = 0.42$) and predictive accuracy, with correctly classified cases exceeding 78%. Interaction analyses indicated that the intervention's effect on female participation was most pronounced in schools with previously low baseline enrollment and in socio-economically marginalized student populations.

9.3 Relative influence of individual, social, cultural and institutional factors

The study examined the relative influence of ten latent factors on students' decisions to enroll in vocational education, with particular attention to gender-specific dynamics. Labour market expectations, student skills, and aptitude factors demonstrated the strongest positive effects on enrollment, whereas socio-cultural norms, gender role models, and structural barriers exerted negative influences, particularly for female students. Targeted promotional interventions, when combined with inclusive school climates, substantially enhanced female participation, highlighting the synergistic role of policy, pedagogy, and community engagement in shaping enrollment outcomes.

Estimated coefficients and corresponding marginal effects from regression analyses provide a quantitative assessment of these influences, as reported in Table 4. These results underscore the

importance of addressing both structural constraints and psycho-educational mechanisms to promote equitable participation in vocational education.

Table 4. Binary-logistic regression results: factors extracted from the data

Factor	Coefficient	Marginal Effect (%)	Significance
Labor Market Signals	3.161	23.59	*** (p < 0.01)
Student Skills and Aptitudes	1.690	5.42	*** (p < 0.01)
Community Traditions and Social Norms	0.732	2.08	*** (p < 0.01)
Gendered Role Models	-0.285	0.73	*** (p < 0.01)
Perception of Inclusion in Vocational School	-1.045	0.35	** (p < 0.05)
Access to Information	-0.161	0.20	*** (p < 0.01)
Environment in Basic Education School	0.188	1.21	n.s.
Demography and Family	-0.361	0.70	n.s.
Economic Factors	0.235	1.26	n.s.
Gender (Female)	-5.639	0.00	** (p < 0.05)
Promotional Intervention	-0.950	1.13	n.s.
Gender × Promotional Intervention	-2.645	0.07	** (p < 0.05)
Model Fit: R^2 = 0.73;	**Chi-square = 3.328, *****	**p < 0.01**	

Notes: n.s. = not significant; *p < 0.1, **p < 0.05, ***p < 0.01. Marginal effects reflect approximate percentage point changes in the probability of vocational enrollment associated with a one-unit change in the predictor. Model fit: R^2 = 0.73; Chi-square = 3.328, p < 0.01

Labor market signals emerged as the strongest predictor of vocational enrollment, increasing the likelihood of participation by nearly 24 %. Students' self-assessed skills and aptitudes also significantly influence choice, contributing an additional 5.4 %.

Cultural and social factors exhibit complex effects. Community traditions and peer norms positively affect enrollment (2.1 %), whereas exposure to gendered role models acts as a barrier (reducing probability by 0.73 %). Students' perceptions of inclusive and equitable school environments also contribute modestly to increased participation (0.35 %).

Gender disparities remain substantial. Female students are markedly less likely to enroll in vocational education (Coefficient = -5.639), reflecting entrenched socio-cultural and structural barriers. However, targeted promotional interventions effectively mitigate this gap: the interaction between gender and promotional measures increased the probability of female enrollment by approximately 7 %, holding other factors constant.

Other variables, including access to information, family and demographic characteristics, school environment in basic education, and economic conditions, showed limited or non-significant effects. Overall, the model explains a substantial portion of the variance in vocational enrollment (R^2 = 0.73), confirming the robustness of the findings.

Quasi- experimental monitoring further substantiates these findings. Aggregate student participation in intervention schools was approximately seven times higher than in matched control schools, while female participation was nearly twice as high, underscoring the effectiveness of community-informed, gender-sensitive strategies in fostering vocational education uptake. The estimated marginal effects of the most influential determinants of vocational enrollment are presented in Figure 5, which delineates both facilitating and inhibiting factors and highlights the salience of gender-responsive interventions. Labor market signals and targeted outreach initiatives emerge as the most robust predictors of female enrollment, whereas gendered role models and perceived exclusion function as significant constraints.

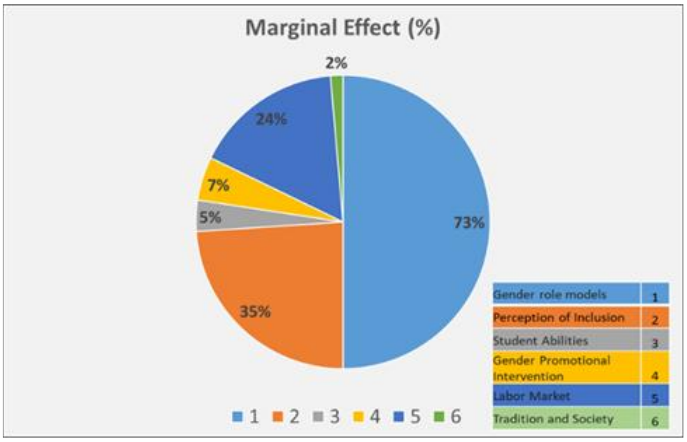

Figure 6. Marginal effects of the strongest determinants of students' vocational enrollment

The analysis examined the relative contributions of individual, social, cultural, and institutional factors to vocational education enrollment, with a particular focus on the impact of psycho-educational and systemic interventions. Labour market signals, student competencies, and aptitude-related variables exerted the strongest positive influence on enrollment, whereas gendered role expectations and structural barriers continued to restrict female participation. Notably, targeted promotional interventions were associated with a substantial increase in girls' enrollment, underscoring the critical role of strategically designed, equity-oriented policies and programs in promoting gender parity in vocational education (Serafini & Soares Marques, 2025; Callaghan & Siann, 2001). These results are illustrated in Figure 6, which presents the relative contributions of the ten latent factors to vocational enrollment. The figure visually demonstrates the positive effects of labour market expectations, skills, and aptitude, alongside the limiting influence of socio-cultural norms, gender role models, and structural barriers. It also highlights the synergistic effect of targeted interventions combined with inclusive school climates, showing how multi-level strategies can effectively enhance female participation. Overall, the findings indicate that vocational education systems function as gendered institutions but are responsive to interventions that address both structural and individual-level determinants, providing actionable insights for policy and practice aimed at fostering gender equity.

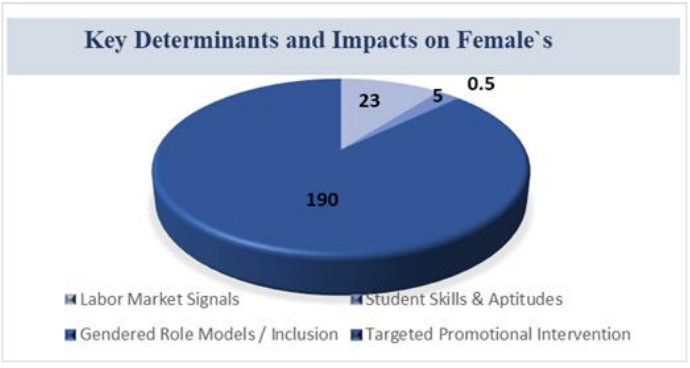

Figure 6. Key determinants and quasi- experimental impacts on VE participation
Note: For the "Targeted Promotional Intervention," 190% represents the 1.9× increase in female participation

10. Policy Implications for Albanian Vocational Education

The findings have important implications for vocational education policy in Albania. First, the strong influence of labour market signals on students' enrollment decisions suggests that vocational education policies should strengthen the connection between schools and employers. Expanding work-based learning opportunities, apprenticeships, industry partnerships, and labour market information systems would improve students' understanding of employment prospects and enhance the attractiveness of vocational pathways, particularly for girls.

Second, the persistent negative effect of gender stereotypes and gendered role expectations indicates the need for gender-responsive educational policies. National and local authorities should integrate gender equality objectives into vocational education strategies, including targeted awareness campaigns, career guidance programs, and the promotion of female role models in technical and STEM-related occupations. Such measures are particularly important in sectors traditionally dominated by men, where female participation remains exceptionally low.

Third, the results demonstrate that targeted promotional interventions significantly increase girls' enrollment. This finding supports the institutionalization of gender-sensitive outreach initiatives within the vocational education system. The Ministry of Education and the National Employment and Skills Agency (NESA) should consider scaling up successful intervention models, particularly in rural and socio-economically disadvantaged regions where barriers to participation are most pronounced.

Fourth, the findings highlight the importance of creating inclusive and supportive school environments. Investments in school infrastructure, transportation services, dormitory facilities, digital resources, and safe learning spaces are necessary to reduce structural barriers that disproportionately affect female students. Equally important is the provision of professional development programs for teachers and school leaders to strengthen gender-sensitive pedagogical practices and foster inclusive school cultures.

Finally, the results suggest that vocational education policy should adopt a comprehensive approach that simultaneously addresses individual, social, cultural, and institutional determinants of participation. Rather than focusing exclusively on access, future reforms should promote gender mainstreaming across curriculum design, career guidance, student support services, and monitoring systems. Establishing gender-disaggregated indicators for enrollment, retention, completion, and employment outcomes would enable policymakers to systematically evaluate progress toward gender equity objectives.

Overall, the study demonstrates that increasing girls' participation in vocational education requires more than expanding educational opportunities. It requires coordinated policy action that challenges gender stereotypes, strengthens labour market linkages, improves institutional support mechanisms, and promotes inclusive learning environments. Such reforms would contribute not only to greater gender equality in education but also to Albania's broader objectives of workforce development, social inclusion, and sustainable economic growth.

11. Conclusion and Recommendations

Female participation in vocational education and training (VET) in Albania is shaped by a multifaceted interaction of individual, socio-cultural, and institutional determinants. The findings from the quasi-experimental design indicate that gendered role expectations, combined with structural constraints, continue to significantly limit girls' enrollment, reinforcing the persistent gendered stratification of vocational pathways. At the same time, the evidence demonstrates that these patterns are not fixed. Targeted psycho-educational and system-level interventions produced substantial effects: girls in intervention schools were nearly twice as likely to enroll in VET, while overall participation rates were approximately seven times higher compared to control schools. These results underscore that gendered educational structures are responsive to coordinated, multi-level policy interventions.

From a policy perspective, the findings highlight the need for integrated strategies that address both demand- and supply-side barriers to participation. First, improving structural access is essential,

including the expansion of vocational program availability, upgrading of infrastructure, and targeted investment in underserved and marginalized regions. Second, challenging socio-cultural norms remains critical; this can be achieved through sustained awareness campaigns, gender-sensitive teacher training, and school-based interventions that actively address stereotypes and reshape expectations regarding appropriate educational and occupational pathways for girls.

Third, strengthening student capacities and agency is necessary to support informed decision-making. This includes enhancing career guidance systems, developing students' awareness of labour market opportunities, and fostering skills and motivation aligned with vocational pathways. Fourth, family and community engagement should be institutionalized within policy frameworks, ensuring that parents, local actors, and employers are actively involved in supporting girls' participation in non-traditional fields.

Fifth, the evidence supports the implementation of multi-level interventions, combining structural reforms, normative change, and psycho-educational strategies. Isolated interventions appear to generate limited effects, whereas integrated approaches produce stronger and more sustained outcomes. Finally, the promotion of dual-system and gender-sensitive vocational programs, linking classroom-based learning with labour market exposure, can further enhance both enrollment and retention among female students.

Overall, these findings suggest that reducing gender disparities in vocational education requires more than isolated policy measures. Instead, it demands a coordinated and systemic approach that simultaneously addresses structural inequalities, transforms social norms, and strengthens individual agency. Such an approach offers a viable pathway toward greater educational inclusion and long-term gender equity in both education and the labour market.

12. AI Use Statement

The author declare that no artificial intelligence tools were used in the preparation, writing, analysis, or editing of this manuscript. The content of the manuscript was prepared entirely by the author.

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