

Research Article

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Gender Differences in the Leaders of Tomorrow Program: A Comparative Analysis within the Framework of the Sustainable Development Goals for Quality Education

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Abstract

Background/purpose. Access to higher education promotes development, equity, and innovation. The Leaders of Tomorrow program at Tecnológico de Monterrey offers full scholarships to outstanding low-income students. The objective of this paper is to explore whether there are gender differences in a series of academic and sociodemographic variables among the beneficiaries of the *Leaders of Tomorrow program* at a higher education institution in Mexico.

Materials/methods. This quantitative study uses a descriptive-correlational approach to examine gender differences in academic and sociodemographic variables among 1,466 program beneficiaries over nine years, exploring their impact on student performance and participation. Data were sourced from the Data Hub–Living Lab, an Institute for the Future of Education initiative at Tecnológico de Monterrey. The analysis involved descriptive statistics, mean comparisons, and Pearson correlations.

Results. Key findings include a) no significant differences between men and women in academic averages upon entering university, indicating similar capabilities across genders, b) significant differences were found in the DISC personality model dimensions, with women scoring higher, suggesting the need for more research on cultural and gender influences on personality.

Conclusion. Further research is needed on gender and academic performance. Women scored higher in DISC dimensions, underscoring the need to examine cultural and gender influences on personality.

1. Introduction

Education at all levels is widely recognised as a key driver of a country's social progress and remains a priority on government agendas. In particular, university education represents one of the most significant milestones, as it serves as a gateway for many individuals into society's economic framework (Walker, 2020). However, despite considerable efforts to promote equitable inclusion and expand access to higher education, significant gaps persist and must be addressed (Adrogué & García de Fanelli, 2021; Fajardo, 2018).

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is one of the leading advocates for expanding educational access. Specifically, it has emphasized this through the Sustainable Development Goals (SDGs), particularly Goal 4, which calls on member states to ensure inclusive and quality education while promoting lifelong learning opportunities for all (UNESCO, 2015). UNESCO member states have made significant efforts to align with the goals of the 2030 Agenda. In Mexico, Tecnológico de Monterrey, a private higher education institution internationally recognised in major Latin American rankings, has implemented a program to provide young people with greater access to its educational offerings.

The program is called *Leaders of Tomorrow*, and its mission is to train transformational leaders with social impact. It is aimed at talented young people who require financial support to pursue their university studies at the institution. For a student to obtain a scholarship from this program, some characteristics are required, such as a minimum academic average of 90/100 in high school; demonstrate social leadership capacity, having demonstrated participation in a community project and finally, demonstrate under a socioeconomic study the difficulties to cover university tuition and living expenses involved in university life at the Tecnológico de Monterrey (Méndez-Berrueta et al., 2022).

The literature indicates that academic and psychological factors can help predict a student's academic success upon entering university (Hellas et al., 2018; MacCann et al., 2020). Within the academic factors, various studies highlight that high school GPA, admission test scores, and college GPA can serve as predictors of students' academic trajectories (Allensworth & Clark, 2020; Tatar & Düşteğör, 2020). Gender can also be an important variable to analyze concerning academic performance.

Among the psychological factors, emotional intelligence, frustration tolerance, commitment, and motivation stand out as key influences (Alhadabi & Karpinski, 2020; Pishghadam et al., 2022; Steinmayr et al., 2019). Personality styles can play a determining role in students' academic performance. In this study, the DISC test was used to measure various traits: dominance, which assesses confidence, determination, and the tendency to take control in challenging situations; influence, which evaluates social skills; stability, which examines aspects such as patience, consistency, and cooperation; and compliance, which measures attention to detail and adherence to established rules (Aini et al., 2023; Steenkamp & Goosen, 2024).

Several studies have explored the influence of personal variables on students' academic performance. For instance, research has shown that personal variables have a positive effect on students' first-year GPA (Whipple & Dimitrova-Grajzl, 2020). Similarly, another study found statistically significant differences in high school GPA, with female students achieving higher scores (Saygin, 2020). Regarding personality traits, Alshehri et al. (2018) analyzed personality types in medical students and found a higher prevalence of Type C personality and a lower percentage of students with Type I personality.

Although school and personal variables have frequently been studied to predict students' academic success, it is necessary to research student samples with economic or social disadvantages

but outstanding profiles, such as those in the Leaders of Tomorrow program. Studies specifically focused on this type of student remain scarce, making it essential to carry them out to gather information that supports informed decision-making regarding the ideal student profile or the necessary interventions to ensure their academic success. Additionally, studies analyzing gender differences are even less common.

In this context, the present study aims to explore whether there are gender differences in a series of academic and sociodemographic variables among the beneficiaries of the Leaders of Tomorrow program at a higher education institution in Mexico. It is expected that statistically significant differences will be found between students' gender and their high school academic average, as well as their admission test scores. Similarly, gender differences are anticipated in students' current academic performance and across the four factors of the DISC model. Furthermore, a statistically significant correlation is expected between students' current semester GPA, university admission scores, and the dimensions of the DISC model.

2. Literature Review

2.1. Sustainable Development Goals for Quality Education

The advocacy of quality education worldwide is a key issue in social, economic, and environmental development (Ferguson & Roofe, 2020). Since 1992, UNESCO has fostered this through various policies and actions (Lai & Peng, 2019). In 2015, the United Nations (UN) proposed 17 goals and 169 targets, forming a new paradigm through which the UN member states seek to secure sustainable development for 2030. Amid the 17 Sustainable Development Goals (SDGs), the fourth SDG focuses on inclusive, equitable, and quality education that promotes lifelong learning. This objective emphasizes access to education and the development of key competencies and technical skills that enable countries to compete globally. Strengthening teacher training and improving curricula is crucial to ensure education meets current and future labour market demands (Khurshid et al., 2020). Therefore, investment in education systems that adapt to the rapidly changing global landscape is essential to empower individuals and promote innovation, ultimately driving sustainable development on a global scale.

The implementation of these SDGs has had its ups and downs according to the context, so in developing countries, it has revealed significant challenges, including a lack of funding, infrastructure, and adequate teacher training. However, research has shown that HEIs play a critical role in transforming societies by incorporating sustainable development approaches into their curricula. Recent studies suggest that the inclusion of environmental education and sustainable development in academic programs not only raises awareness but also helps develop a skilled workforce capable of addressing socioeconomic and environmental challenges (Castellanos et al 2021; Tasdemir & Gazo, 2020; Zwolińska et al., 2022). Thus, HEIs must continue to evolve, fostering partnerships and innovative strategies to overcome these barriers and contribute to the achievement of the SDGs in developing countries.

HEIs have started to respond positively, focusing on modernizing academic programs and motivating faculty to implement more inclusive and sustainable approaches. Despite progress, challenges such as limited technological resources and resistance to change in some academic sectors persist. To ensure these institutions can compete internationally, continuous efforts are needed to align educational policies with global goals, equipping future professionals with the competencies necessary to lead sustainable development (Ferrer-Estévez & Chalmeta, 2021). In this context, research frameworks have been proposed to implement SDG 4 within course curricula, research topics, and institutional operations (Leal Filho et al., 2021). Ultimately, the long-term success of these initiatives will depend on the commitment of HEIs to foster a culture of sustainability and innovation, ensuring that they remain at the forefront of global educational and development trends.

2.2. Education Implications in Reduction of Inequalities and Linkage to the Leaders of Tomorrow Program

Any society that wishes to improve socio-economic, political, environmental, and cultural conditions must promote quality education. Unfortunately, developing countries have a high percentage of school dropouts; where several factors contribute to that, including economic problems, absence of family support, insufficient motivation, lack of educational opportunities, and the influence of negative groups or unfavorable social environments (Aina et al., 2022; Perchinunno et al., 2021; Wild, 2020). Educational equity represents an opportunity for schools to achieve good academic standards, with quality teachers and materials as vehicles for social mobility (ITAM, 2019). It is, therefore, valuable that higher education institutions are concerned with promoting programs that foster reducing inequalities.

Tecnologico de Monterrey, a not-for-profit higher education institution based in Mexico, seeks precisely to promote quality education within the reach of any person, regardless of their socio-economic level. According to the National Council for the Evaluation of Social Development Policy, its program Leaders of Tomorrow has contributed to reducing poverty in the country, which affects 36.3% of Mexicans, according to the National Council for the Evaluation of Social Development Policy (CONEVAL, 2023). For this reason, Tecnologico de Monterrey aims to reduce the inequality gap in access to quality education at higher education, and for this purpose, it awards full-tuition scholarships to brilliant young people who do not have the financial resources to be able to pursue a degree at the institution (Tecnologico de Monterrey, 2024). This program also encourages young people who are awarded a scholarship to support activities that allow other students to also have access to becoming part of it; thus, in addition to contributing to their quality academic training, they are also trained as agents of change.

In addition to promoting the reduction of economic inequalities, Tecnologico de Monterrey also seeks to promote gender equality. Actions have been implemented such as the creation of the Impulsa Committee, made up of male and female leaders in the institution to bring a gender perspective to processes and decision-making, and to promote actions such as getting more women into management positions and increasing the participation of women in middle management to 51% and in the teaching staff to 45% (Ruiz, 2024). The institution has relied on the support of the university community, as well as external support for funding programs like Leaders of Tomorrow.

Alumni associations, such as the one at Tecnologico de Monterrey called EXATEC, and clubs participate in the philanthropic contribution. They are committed to inviting other EXATECs and external friends to join the cause of the social mobility program (EXATEC, 2024). In addition, care has been taken in the selection process to ensure that the students who join the Leaders of Tomorrow program are characterized by the fact that, despite living in limited contexts, they show empathy for those who face the same or more unfavorable conditions as them (Villanueva, 2021), thus joining the commitment to continue contributing to the continuity of this program at the end of their studies. This program has had very positive results, which motivate members of Tecnologico de Monterrey community and outsiders to continue supporting it financially and providing such an enriching educational experience to the Leaders of Tomorrow it commits them to support the cause so that other students who require a full scholarship can also have access to complete a degree at Tecnologico de Monterrey in any of its Campus.

2.3. Sustainable Development Goals and Gender Differences

The current context implies the establishment of a pathway in higher education that promotes gender equality based on the Sustainable Development Goals (SDGs) of the 2030 Agenda. SDGs are a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity (United Nations, 2024). The SDGs are crucial for countries, organisations, and

individuals to align their efforts toward a common and ambitious vision of a better future (Sebhatu & Enquist, 2022; Amornkitvikai & Pholphirul, 2023). The United Nations 2030 Agenda for Sustainable Development aims to address various global challenges, including SDG 4: Quality Education and SDG 5: Gender Equality (United Nations, 2015). SDGs 4 and 5 should be a focus of interest when it comes to analyses that pursue improved education within a gender equality framework.

Contributing to an educational setting that promotes gender equality will benefit different spheres: economic, political, cultural, and social. Among the elements regarding unknown gender differences, Wong et al (2002) state that girls perform better in single-sex schools, boys in co-educational schools, and boys in the arts stream perform least well in public examinations. On the other hand, in higher education settlements, Siddiq & Scherer (2019) mention that in the ICT areas, the gender gap may not be as severe as previously claimed due to girls showing significant positive performance advantages over boys on performance-based assessments. For Delaney & Devereux (2019), the gender gap in STEM college programs is primarily driven by subject choices and grades, with a smaller gap in high-achieving students and affluent areas. Coping with these gender differences in various educational contexts can lead to more tailored interventions, ultimately enhancing overall academic performance and ensuring equitable opportunities for both genders in diverse fields of study.

One aspect that is important to address is the transformation of discriminatory social norms and harmful gender stereotypes into more egalitarian social structures and power relations for all genders (United Nations, 2024). For example, in the selection of STEM field careers, Pilotti (2021) states that targeted educational interventions can improve females' motivation and enrollment in those fields while enhancing males' academic success in non-STEM fields like business. In this same line of unbalanced STEM fields in HEIs, Feniger et al (2021) suggest that equalizing gender ratios in male-dominated institutions can improve on-time graduation chances for both men and women. Another important aspect is that gender differences in higher education are more pronounced at the beginning of the career and fade out later (Lörz & Mühleck, 2018). Thus, creating gender-balanced educational environments from the onset is crucial to fostering long-term equality and ensuring that both men and women can thrive academically and professionally across all fields.

The participation of educational institutions in the achievement of SDG 5, which is aligned with gender equality, is fundamental for the promotion of inclusive education, the empowerment of all genders, and the creation of equitable opportunities in both academic and professional spheres. There might be some bias in the process of assessing the outcomes, according to Saygin (2020). He states that it is influenced by the student assessment method used in a centralized college admissions system, with females outperforming males in high school grade point averages but males outperforming females in standardized test scores. Moreover, Niessen et al (2019) comment that curriculum sampling can effectively predict academic performance in college admissions with minimal gender bias, offering a feasible method for high-stakes selection settings. At Tecnológico de Monterrey, in addition to guaranteeing quality education, it is ensured that this can be acquired in a context that promotes the fulfilment of the SDGs of the 2030 Agenda. The Leaders of Tomorrow program has given rise to a series of social initiatives, 40.32% of which were generated by men and 59.68% by women, of which two are centred on addressing SDG 5. Gender equality: the HeForShe and the Women's Scientific Seedbed initiatives (Leaders of Tomorrow, 2022). The institution joined the HeForShe initiative in 2019 and, this year, renewed the HeForShe commitments that are part of the Collaboration Agreement signed with UN Women in 2023 for the implementation of the Safe Campus Program for the Prevention of Gender Violence. The HeForShe movement aims to create a bold, visible, and united force for gender equality, and men and people in all their diversity are invited to actively participate (UN WOMEN, 2024). The Women's Scientific Seedbed' project aims to empower Spanish-speaking women and girls through science and technology, while at the same time

giving visibility to women scientists, to recognize their work and showcase female role models in these areas, thus empowering new generations and contributing to the fight against sexism and gender inequality (Líderes del Mañana, 2022). Through these initiatives, the aim is to promote quality education in the framework of gender equality.

The objective of this paper is to explore if there are gender differences in a series of academic and sociodemographic variables among the beneficiaries of the *Leaders of Tomorrow program* at a higher education institution in Mexico, to better understand how these differences might influence student performance and participation in their academic life.

3. Methodology

3.1. Type of Study

This study employs a quantitative, non-experimental, cross-sectional design with a descriptive and correlational approach, aiming to analyze the relationships among the variables considered (Ato et al., 2013; Gall et al., 2007).

3.2. Participants

The study population comprises approximately 2,200 students participating in the *Leaders of Tomorrow* program from 2013 to 2023. However, only 1,466 students were included in this study. The inclusion criteria required students to be of legal age at the time of data collection and to have provided consent for their data to be used for research purposes.

The sample comprised 1,466 students who were beneficiaries of the Leaders of Tomorrow program. Of the participants, 48.7% were male, and 51.3% were female. The majority resided in urban areas (71.4%), followed by semi-urban (13.1%) and rural areas (6.8%). Regarding high school education, 96.4% of the participants did not come from the Tecnológico de Monterrey system. Additionally, 30.8% were first-generation college students, and 57% of the sample were Mexican students. In terms of cohorts, the largest group corresponds to 2014 (14.1%), followed by 2018 (13.6%) and 2019 (12.8%). More recent cohorts, such as 2022, represent 5.5%.

3.3. Data Collection

The Data Hub-Living Lab, an Institute for the Future of Education initiative at Tecnológico de Monterrey, owns the dataset used in this study. As part of the ethical considerations for data management, the Leaders of the Tomorrow program, the Data Governance Office at Tecnológico de Monterrey, and the *Data Hub-Living Lab* were involved in the process. These entities were responsible for safeguarding the participants' sensitive information. Finally, these entities released the dataset on November 27, 2023.

3.4. Data Analysis

For data analysis, first, the database was cleaned, the values were re-coded, and the variables were included in the study (see Table 1). Data analysis consisted of descriptive statistics, mean comparisons, and Pearson correlations. For mean comparisons, the effect size was calculated with Cohen's D index, where values below 0.20 reflect a weak effect size, whereas values above 0.80 reflect a strong effect size (Cohen, 1998).

Table 1. Data set variables and definitions.

Variable	Definition	Values
Student gender	Student's gender.	Female; Male
student_originSchool.gpa	Grade obtained from the student's High School level.	Interval 90-100
student_admission_test.score	Admission test score.	PAA 400-1600, PAL 0-100, and PBT 0-1600
student.term_gpa	Average of the student's grades for the current academic period (includes failed courses).	Interval 0-100
Dominance_score	Part of the DISC test that measures Dominance (D). The D personality tends to be direct and decisive, prefers to lead rather than follow, is self-confident, solves problems, and makes decisions; they lean towards entrepreneurship, leadership, and management.	Interval 10-99; Does not apply = The test was not applied
Influence_score	Part of the DISC test that measures Influence (I). The I personality is enthusiastic, optimistic, communicative, persuasive, impulsive, and emotional; they are not afraid of being the center of attention, they trust people, they enjoy being around other people, and they will work better working in a team	Interval 10-99; Does not apply = The test was not applied
Steadiness_score	Part of the DISC test that measures Steadiness (S). The S personality is known to be constant, stable, and predictable; they are even-tempered, friendly, understanding of others, and generous with the people they care about, they know how to listen, they prefer personal relationships, and they are open with their loved ones.	Interval 10-99; Does not apply = The test was not applied
Conscientiousness_score	Part of the DISC test that measures Conscientiousness (C). The C personality is exact, precise, detail-oriented, and conscientious; they think analytically and systematically and make decisions carefully, are perfectionists and have very high standards for themselves and others, focus on details, tend to be good problem solvers, and are highly creative people.	Interval 10-99; Does not apply = The test was not applied

4. Results

The mean comparisons of the admission grade average for students in the *Leaders of Tomorrow* program, based on gender, show that both groups of students have similar scores upon entering university education. Women have a slightly higher average, and a marginally significant difference was found. The effect size is also considered weak, which confirms that the difference in means between the groups is small (see Table 2).

Table 2. Mean Differences Between Gender and Grade Point Average from Students' Previous School

	Male		Female		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Grade point average from student's previous school.	96.3	2.7	96.4	2.8	-0.78	0.4	0.04

A Student's *t*-test for independent samples was conducted to compare the admission test scores between men and women. The results show that the average score for men is slightly higher than that of women; however, the difference between the two groups is not statistically significant. The effect size is trivial, indicating that the magnitude of the difference between the scores is minimal (see Table 3).

Table 3. Mean Differences in Student Admission Test Scores by Gender

	Male		Female		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Student's admission test score.	1251	493.8	1212	520.5	1.44	.150	.07

Concerning the academic average of students during the current semester, the mean differences between both groups show that women have a slightly higher average. However, this difference was not statistically significant. The effect size of the test confirms that the differences between the two groups are small (see Table 4).

Table 4. Mean Differences Between Academic Average and Gender of Students in the Leaders of Tomorrow Program

	Male		Female		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Average of the student's grades for the current academic period	89.1	18.8	90.3	16.5	-1.24	.214	.06

The mean differences in the four factors of the DISC model between men and women. The results reveal that women scored higher in all dimensions compared to men. These differences are statistically significant, and the effect sizes for each dimension can be considered small (see Table 5).

Table 5. Mean Differences Between Gender and DISC Dimensions

	Male		Female		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Dominance	30.4	25.8	35.4	25.9	-3.70	.000	.19
Influence	38.9	33.4	44.6	32.6	-3.29	.001	.17
Stability	35.6	30.0	39.9	28.7	-2.83	.004	.14
Meticulousness	39.6	33.6	42.2	31.5	-1.53	.012	.07

Moreover, Table 6 presents the Pearson correlations between the general semester average, the admission test score, and the scores in the four DISC model dimensions (Dominance, Influence, Steadiness, and Conscientiousness). The general semester average shows positive and significant correlations with all four DISC dimensions, although of low intensity. The admission test score also shows significant correlations with all DISC dimensions, which are stronger than those with the general average. Among the DISC dimensions, the correlations are significantly higher, with values ranging from .734 to .844, indicating strong relationships between these factors (see Table 6).

Table 6. Pearson Correlations Between General Semester Average, Admission Average, and DISC Dimensions

	1	2	3	4	5	6
Overall average per semester	-					
Admission test score	.036 [-.089,.017]	-				
Dominance	.130** [.078, .182]	.258** [-.305, .209]	-			
Influence	.145** [.090, .194]	.271** [-.318, .223]	.785** [.765, .804]	-		
Steadiness	.157** [.104, .208]	.331** [.375,.284]	.744** [.720, .766]	.748** [.725, .770]	-	
Conscientiousness	.141** [.088,.193]	.277** [.323, .229]	.734** [.709, .756]	.698** [.671, 724]	.844** [.829,.858]	-

5. Discussion

The mean comparisons regarding the academic entry average to the university and gender show that both men and women have similar scores. with statistically significant results. These results are positive as it can be stated that both men and women have the same capabilities to achieve optimal academic performance. Our results differ from those reported by Quadlin (2018), who states that women achieved a higher academic average in their studies than men. However, in other related studies, no statistically significant differences were found between gender and academic habits (Kaur & Singh, 2020; Nunaki et al., 2019). Although these findings may suggest that there are no gender differences in academic performance, the results are still inconsistent, and further investigation is needed regarding the influence of gender on the academic performance of high school students seeking entry into scholarship programs to ensure equal access to such programs.

Regarding the current academic average of students in the *Leaders of Tomorrow* program, it was found that men had slightly higher scores, although these were not statistically significant. Our results differ somewhat from what is found in the literature. For example, some studies report statistically significant differences between men's and women's academic averages, study habits, and academic commitment. It is also reported that women perform better academically than men (Alzahrani et al., 2018; Kuśnierz et al., 2020). These results show that although gender is a widely studied variable, there is still no consensus on its influence. Integrating other demographic, individual, and contextual variables is necessary to clarify their effect on students' academic performance. Educational institutions must implement policies ensuring gender equality in higher education. Doing so promotes more inclusive learning environments and contributes to broader social progress in line with the SDG 5 goals.

Concerning gender differences and the dimensions of the DISC personality model, statistically significant differences were found in all dimensions, with women having higher averages. These findings align with what is reported in the literature, where women are depicted as having more achievement-oriented, effective communication, competitive, and self-confident personality traits compared to men (Reyes et al., 2021; Serrano et al., 2022). These findings highlight the need for further research on the influence of gender and the DISC personality model dimensions, especially to understand what happens with male students who score lower. It can be assumed that cultural factors may inhibit men from openly displaying aspects of their personality, compared to women, who are often more expressive and open about their emotions.

Lastly, correlations between the study variables showed positive and significant associations with the general average and the university admission score across the four dimensions of the DISC model. These findings partially align with the literature, where the DISC personality model has been more commonly applied in human resources or organisational settings and less so in academic or student contexts. Thus, the literature presents limited solid evidence. However, it was found that the pre-university academic average and dominance are predictors of academic success, though this effect was not found in the other dimensions (Mills et al., 2009). These findings underscore the need to continue exploring personal variables like the DISC model dimensions to predict students' academic performance and relate them to other personal and contextual variables to develop strategies that reduce educational gaps and mitigate academic underachievement among students.

6. Conclusion

The study shows no significant differences between men and women in the academic average upon entering university, suggesting that both genders have similar capabilities. However, it is emphasized that further research is needed to explore the influence of gender on academic performance. Significant differences were found in the DISC model dimensions, with women obtaining higher scores, highlighting the importance of further studying the cultural and gender

influence on personality. Additionally, it was observed that dominance in the DISC model predicts academic success, underscoring the importance of further exploring these dimensions and their relationship with other variables to improve educational policies and reduce gender gaps.

7. Suggestion

From both theoretical and practical perspectives, the findings underscore the importance of addressing gender equality in academic performance and developing personal skills within the framework of the *Leaders of Tomorrow* program. Tailoring interventions based on DISC personality traits and reinforcing inclusive policies can help maximize selected students' academic and personal potential.

The study presents several theoretical and methodological limitations. Theoretically, the lack of consensus in the literature on gender differences in academic performance makes it difficult to draw definitive conclusions, and the use of the DISC model, primarily applied in workplace settings, limits its generalization to academic contexts. Additionally, focusing on demographic variables such as gender neglects other personal and contextual variables that might influence performance. Methodologically, the sample size may not be representative, and the cross-sectional design prevents the analysis of changes over time. The use of self-report questionnaires introduces potential subjective bias, and the lack of control over external variables, such as socioeconomic or cultural factors, reduces the study's internal validity. These limitations suggest the need for further research to address these aspects.

Future studies should consider longitudinal designs to observe how the relationships between gender, personality, and academic performance evolve. It is also essential to incorporate contextual and personal variables, such as socioeconomic status and family environment, to obtain a more comprehensive view. Expanding the focus to other personality models, such as the Big Five, and diversifying the sample size and characteristics would allow for greater generalization of the results. It is also crucial to control external variables, such as cultural factors and access to resources, and complement quantitative studies with qualitative research that delves deeper into students' perceptions. Finally, evaluating the impact of educational interventions that promote leadership and communication skills is suggested, analyzing how this influences academic performance across both genders.

Declarations

Author Contributions. LDGM. Conceptualization of the study and definition of the research problem, development of the theoretical framework and conceptual foundation, overall coordination of the writing process and manuscript review, analysis and discussion of findings, and writing of the introduction and conclusion. CAN. Review and systematization of relevant scientific literature, methodological design of the study, development of the methodology section, support in the interpretation of results and discussion, and coordination with the journal, including manuscript submission and response management to reviewers. IMCM. Data collection and analysis, development of tables and graphs, presentation of results, writing of the results section, and review and editing of the manuscript to improve coherence and clarity. DFB. Support in the review of references and manuscript formatting, supervision of compliance with publication guidelines, and participation in style correction and final review of the document.

Conflicts of Interest. The authors have no conflict of interest

Funding. (if any)

Ethical Approval. The data were supervised and protected under the guidelines of Data Governance and the Living Lab-Data Hub of Tecnológico de Monterrey and were approved in their latest version on November 27, 2023.

Data Availability Statement. The data that support the findings of this study are available from the Institute for the Future of Education (IFE)'s Educational Innovation collection of the Tecnológico de Monterrey's Research Data Hub but restrictions apply to the availability of these data, which were used under a signed Terms of Use document for the current study and so are not publicly available. Data is, however, available from the IFE Data Hub upon reasonable request at <https://doi.org/10.57687/FK2/UFM2QH> (accessed on 08 July 2024).

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