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Scientific articles

Programa de Tutoría entre Pares como estrategia para reducir la reprobación y deserción en instituciones de Educación Superior

Peer Tutoring Program as a Strategy to Reduce Failure and Dropout Rates in Higher Education Institutions

Programa de tutoria entre pares como estratégia para Reduzir a Reprovação e a Evasão em Instituições de Ensino Superior

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Resumen

Existe una constante preocupación en las instituciones educativas por mantener índices altos de eficiencia terminal, para lo cual, la reprobación y deserción deben ser monitoreadas constantemente y establecer estrategias que favorezcan el logro de objetivos. Este trabajo tiene como propósito evaluar un programa de tutoría entre pares en cuanto a su contribución para fortalecer la formación académica de estudiantes de un instituto tecnológico. La tutoría entre pares es una estrategia que tiene como objetivo

brindar asesoría y acompañamiento de forma colaborativa entre estudiantes y tiene como fundamento el modelo de enseñanza constructivista. Se presenta una investigación con un enfoque cuantitativo, de alcance descriptivo y con una metodología de investigación-acción. La muestra estuvo conformada por 43 estudiantes que participaron en el programa, como el instrumento se utilizó un cuestionario para analizar las subvariables: labor del tutor, logros personales, compromiso del estudiante, servicios del programa e infraestructura. Los resultados revelan niveles altos de satisfacción con el programa de tutoría entre pares, con las frecuencias más altas en los rangos 3 (satisfecho) y 4 (muy satisfecho) en cada uno de los indicadores de las variables, siendo la subvariable labor del tutor la que obtuvo la puntuación más alta. Este trabajo aporta una estrategia de intervención relevante para disminuir el rezago educativo que puede incidir de forma positiva en indicadores institucionales como las tasas de reprobación y deserción, al aprovechar recursos disponibles en las instituciones (alumnos destacados),

Palabras clave: Tutoría entre pares, Educación Superior, satisfacción, rezago educativo, reprobación, deserción.

Abstract

There is a constant concern in educational institutions about maintaining high retention rates, for which requires continuous monitoring of failure and dropout rates and the establishment of strategies to support goal achievement. This study aimed to evaluate a peer tutoring program in terms of its contribution to strengthening the academic development of students at a technological institute. Peer tutoring is a strategy designed to provide collaborative support between students, based on the constructivist teaching model. This research follows a quantitative approach, with a descriptive scope and an action-research methodology. The sample consisted of 43 students who participated in the program, and a questionnaire was used to analyze the sub-variables: tutor performance, personal achievements, student commitment, program services, and infrastructure. The results indicate high satisfaction levels with the peer tutoring program. The highest frequencies were observed in categories 3 (satisfied) and 4 (very satisfied) across all indicators, with 'tutor performance' standing out as the highest-rated sub-variable. This study provides a relevant intervention strategy to reduce educational lag, by leveraging outstanding students as a resource within institutions, which can positively impact key institutional indicators such as failure and dropout rates".

Keywords: Peer tutoring, Higher Education, satisfaction, educational lag, failure rates, dropout rates.

Resumo

Existe uma constante preocupação nas instituições educacionais em manter altos índices de eficiência terminal, para isso, a reprovação e a evasão devem ser constantemente monitoradas, sendo necessário estabelecer estratégias que favoreçam o alcance dos objetivos. Este estudo teve como objetivo avaliar um programa de tutoria entre pares quanto à sua contribuição para fortalecer a formação acadêmica dos estudantes de um instituto tecnológico. A tutoria entre pares é uma estratégia que visa proporcionar orientação e acompanhamento colaborativo entre estudantes, fundamentada no modelo de ensino construtivista. Esta pesquisa segue uma abordagem quantitativa, com alcance descritivo e metodologia de pesquisa-ação. A amostra foi composta por 43 estudantes que participaram do programa e foi aplicado um questionário para analisar as subvariáveis: desempenho do tutor, conquistas pessoais, compromisso do estudante, serviços do programa e infraestrutura. Os resultados revelam altos níveis de satisfação com o programa de tutoria entre pares, com as maiores frequências nos níveis 3 (satisfeito) e 4 (muito satisfeito) em todos os indicadores das variáveis, destacando-se a subvariável desempenho do tutor como a mais alta. Este estudo oferece uma estratégia de intervenção relevante para reduzir o defasagem educacional, aproveitando os recursos disponíveis nas instituições (alunos de destaque), o que pode ter um impacto positivo sobre indicadores institucionais como reprovação e evasão.

Palavras-chave: Tutoria entre pares, Ensino Superior, satisfação, atraso educacional, reprovação, evasão.

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Introduction

One of the main challenges facing educational institutions is completion efficiency, an indicator obtained by dividing the number of graduates in a class by the number of students enrolled upon entry. This indicator is one of the essential criteria for evaluating the performance of an educational program or institution.

The National Association of Universities and Higher Education Institutions (ANUIES) estimates that the completion rate in Mexico is approximately 39%, including only those graduates who earned their bachelor's degree (López et al., 2008). However,

there are disparities between different studies, as well as between institutions, study programs, and even regions.

In another study, Herrera et al. (2024) argued that, between 2021 and 2022, the national completion rate in higher education reached 27.6%, showing an improvement compared to previous years and a significant difference with the data provided by ANUIES. Even with these data, it is important to mention that completion rate remains a significant challenge for higher education in Mexico, as this indicator reflects a high proportion of students who do not complete their studies or do not do so within the expected time, highlighting the problems of dropouts and failure that educational systems face.

Failure is another challenge for higher education institutions, as it occurs when students fail to meet the minimum standards required to pass a subject. This has negative implications for academic backwardness and can worsen, leading to dropouts.

Table 1. School failure percentages in the ITJMMPyHPV

	Business management	Architecture	Electromechanics	Systems	Gastronomy	Tourism	Total
Total current students	468	286	293	267	241	247	1802
Total number of students with at least one subject failed from the second to the fifth semester	65	75	48	34	35	53	310
Percentage of students with at least one failed subject from the second to the fifth semester	13.89%	26.22%	16.38%	12.73%	14.52%	21.46%	17%

Source: Own elaboration

Table 1 shows the documented failure rates at the José Mario Molina Pasquel y Henríquez Technological Institute, Puerto Vallarta academic unit (ITJMMPyHPV) in 2021, considering students with at least one failed subject from the second to fifth semester. The program with the highest failure rate is Architecture (26.22%), followed by Tourism (21.46%), Electromechanical Engineering (16.38%), and Gastronomy (14.52%). In contrast, the program with the lowest failure rate is Systems Engineering (12.73%).

Based on this contextual information, a project is proposed with the intention of reducing school failure as a strategy that could impact the institution's completion efficiency. The development of a peer tutoring program is also proposed, in which the available human resources of excellent students from advanced semesters can be leveraged to provide advice and academic support to students who are failing.

To this end, the following questions arise: What characteristics does a peer tutoring program require to positively impact the academic development of undergraduate students? What is the assessment of ITJMMPyHPV students who participate in the peer tutoring program? How does this program impact students' academic development?

For the development of this project, the following research objectives were formulated:

General objective

Implement an academic support program based on a peer-to-peer tutoring methodology that will help reduce failure and dropout rates and contribute to educational improvement at ITJMMPyHPV.

Specific Objectives

1. Review the state of the art to analyze scientific literature that facilitates the foundation and design of a peer tutoring program consistent with the characteristics and needs of the ITJMMPyHPV,

2. Design a peer mentoring program in accordance with the characteristics and needs of the ITJMMPyHPV, establishing its guidelines and operating strategies."

3. Implement the academic program in accordance with the guidelines established in the design.

4. Evaluate the impact of the peer tutoring program based on the perception of students who received advice and academic support.

Mentoring and peer mentoring

In Mexico, mentoring has its origins in the 19th century, especially in Lancasterian schools, where it was originally conceived as a moral guide. Over time, this concept has evolved into a comprehensive support model, consolidating itself as a key strategy in education (Navarrete & Tomé, 2022).

Mentoring is not a recent concept; its practice dates back to the early days of the university. At that time, the tutor fulfilled a dual role: as a figure of scientific authority and as a personal advisor. Their responsibilities ranged from academic supervision to the

correction of students' intellectual, social, and moral conduct (Lázaro, 1997). As this author states, "pedagogical vigor lies more in the tutorial system than in the lecture hall (…), where mentoring is a cornerstone of the English pedagogical system" (p. 487); in contrast to the teaching approach characteristic of German universities (Alzate & Peña, 2010).

In this way, tutoring reflects both its traditional nature and its contemporary relevance, adapting to changes in the university function and the social dimension of scientific knowledge. In this context, several higher education institutions direct their efforts toward preventing student dropouts and improving academic performance, reflecting the difficulties and risks that students face throughout their educational process. Among the strategies implemented to address this situation, peer tutoring stands out, a pedagogical practice that contributes to the teaching-learning process, generating mutual benefits for both the tutor and the tutee (Rios & Claudine, 2021).

Peer tutoring is a cooperative learning modality that organizes students into pairs with partially asymmetrical roles: one of them assumes the responsibility of guiding and teaching, while the other reinforces their understanding and acquires new knowledge (Gradaille & Gradaille, 2020).

Benoit et al. (2019) define it as a strategy based on active collaboration between tutor and tutee, in which both participate jointly in the learning process. Therefore, peer tutoring is conceived as an active learning process in which university students provide guidance and support to their peers.

This approach aims not only to foster collaboration and knowledge sharing, but also to facilitate students' full integration into university life, helping them adapt to their new academic and social environment; thus, fostering a sense of community and belonging within the institution (Santiviago et al., 2020).

Tutoring is conceived as a collaborative approach to learning in which the support offered to students with academic difficulties not only promotes their personal and professional growth, benefiting their academic development, but also enriches the tutor's experience by reinforcing their own knowledge and developing important interpersonal skills for the professional and personal spheres, fostering the comprehensive development of both (Topping, 1996; Jhangiani, 2016).

Peer tutoring in the university context has emerged as an essential educational strategy to address challenges such as student dropout and poor academic performance. In practice, this approach establishes roles where those with a deeper understanding of a subject act as tutors for their peers, thus creating a more accessible and friendly learning environment.

Some tutoring programs have proven effective in improving pass rates and reducing dropout rates, making them valuable tools for higher education institutions. These programs promote active learning and engagement, fostering a sense of community and support among students (Benoit et al., 2019; Gradaille & Gradaille, 2020; Valdebenito & Duran, 2014).

Topping (2005) argues that there are additional benefits that are promoted through peer tutoring, mentioning that it contributes to the development of socio-emotional competencies, which are essential for academic success and for professional life. From this, peer tutoring has been valued as an alternative that can influence essential indicators in educational institutions, by intervening in academic problems of lag, and in turn, promote the development of socio-emotional learning to contribute to the comprehensive training of students.

Materials and methods

Methodological aspects

The research approach was quantitative. For the analysis, the variables were quantified using a four-level scale (from 1 to 4) to measure the level of satisfaction. The scope of the research was descriptive, as the project's objective was to evaluate the peer tutoring program based on the perceptions of the students who participated in it, with an emphasis on its impact on academic training.

The method selected for the project was action research, due to its characteristics for implementing an intervention aimed at solving a problem. According to McNiff and Whitehead (2011), action research is a process that allows people to investigate their own practices in collaboration with others, with the goal of improving the understanding and quality of those practices. The project was carried out according to the following phases:

1. Diagnosis or Identification of the Problem

A preliminary analysis identified a high failure rate at the institution, as shown in Table 1. Likewise, widespread difficulties were detected in certain basic science subjects with high failure rates. Therefore, two subjects in which students presented the greatest difficulty understanding were selected: differential calculus and integral calculus.

Students in advanced semesters with competencies in these areas were also identified and encouraged to participate as peer tutors through the release of curricular credits or through the social service program.

2. Action Planning

The peer mentoring program was designed, establishing criteria for its operation. As shown in Table 2, the process consists of several phases, from the identification of participants to the evaluation of mentoring performance. Each step is crucial to ensuring that peer mentoring is effective and beneficial for all involved.

Table 2. Phases of the peer mentoring program.

1. Identification of Participants
- Identify students with educational gaps (failed subjects) by reviewing their academic history and inviting them to participate in the program to receive counseling (counselors). - Identify competent students in the area of basic sciences through teacher recommendations and Kardex review, willing to provide advice (advisors).
2. Selection of Advisors and Advisees
- Analyze the academic needs of the students to be advised in order to integrate groups by subject area. - Select advisors based on their subject matter expertise and their willingness and ability to provide advice.
3. Establishing Goals and Objectives
- Counselors and counselees set clear and achievable goals for counseling sessions.
4. Planning Counseling Sessions
- Determine the frequency, duration and format of the counseling sessions. - Prepare teaching materials and resources necessary for the sessions.
5. Implementation of the Advisory Process
- Advisors and advisees conduct sessions according to the established plan.
6. Evaluation and Monitoring
- The progress of the students toward established goals is assessed, and the work of peer tutors is evaluated by providing constructive feedback to improve learning.

Source: Own elaboration

3. Implementation of the action

The program was implemented during the August-December 2023 semester, with the participation of 11 peer tutors, who provided personalized advice to 43 tutees in differential and integral calculus. The average number of sessions per tutor was five, with a range of three to ten sessions, depending on the needs and progress of the tutees.

4. Information gathering

To analyze the impact of the peer mentoring program, the instrument developed and validated by Zamora-Araya et al. (2019) was used to measure the variable of satisfaction with the program. The research technique used was a survey, which was administered using a web-based form. Table 3 specifies the subvariables and categories of the instrument, which was designed with a scale of values from one to four to measure the level of satisfaction for each category.

Table 3. Subvariables, categories and indicators of the instrument.

Subvariable	Categories
1. Work of the tutor	1. Methodology used
	2. Assertive communication
	3. Mastery of the subject
	4. Provides adequate practices
2. Personal achievements	1. Improve my grades
	2. Understanding the subject matter
	3. Increased security
	4. Mastery of the subject
3. Student Commitment	1. Sufficient study time
	2. I showed interest in tutoring
	3. I participated actively
	4. I clarified most of the doubts
4. Program service	1. Registration process
	2. Availability of counselors
	3. Variety of schedules
	4. Availability of places
	5. Treatment received by staff
5. Infrastructure	1. Classroom ventilation
	2. Comfort of the real estate
	3. Sanitary facilities
	4. Classroom spaces

Source: Own elaboration

Population and sample

The research was conducted using a non-probability convenience sample. The study population consisted of students from the ITJMMPyHPV (1,749 across all the programs offered); the study sample consisted of 43 students who participated in the program. These students were selected after identifying difficulties and gaps in differential and integral calculus. The survey was administered to these students at the end of the program.

Information processing and data analysis

The information obtained from the digital survey was processed through a spreadsheet using Excel office software, and data analysis was carried out using graphs, presenting descriptive statistics for each of the study variables, grouped into categories.

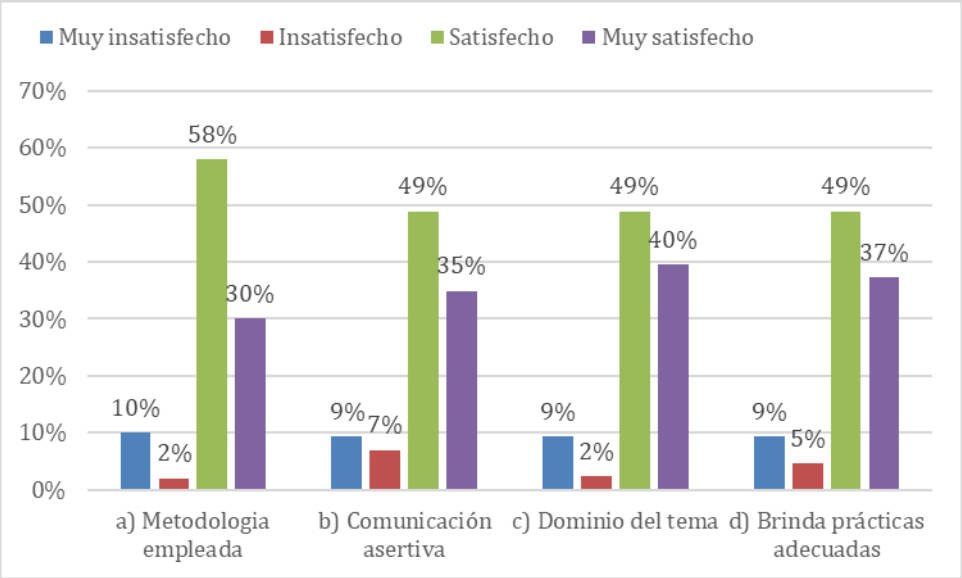
Reflection and evaluation

Based on the results, an analysis is conducted to reflect on the implications and characteristics of the program to make adjustments in areas where opportunities for improvement arise.

Results

Below are the results of the survey administered to 43 students who received academic support from peer tutors.

Figure 1 Work of the **Tutor**



Source: prepared by the authors using data from the ITJMMPyHPV.

Figure 1 shows the results of the Peer Tutor function sub-variable, analyzing the following categories: methodology used, assertive communication, mastery of the subject and quality of the practices provided.

a) Regarding the methodology used: 58% of students were satisfied and 30% were very satisfied with the methodology used, representing a total of 88% who approved the peer tutor's work; however, 10% expressed being very dissatisfied and 2% dissatisfied.

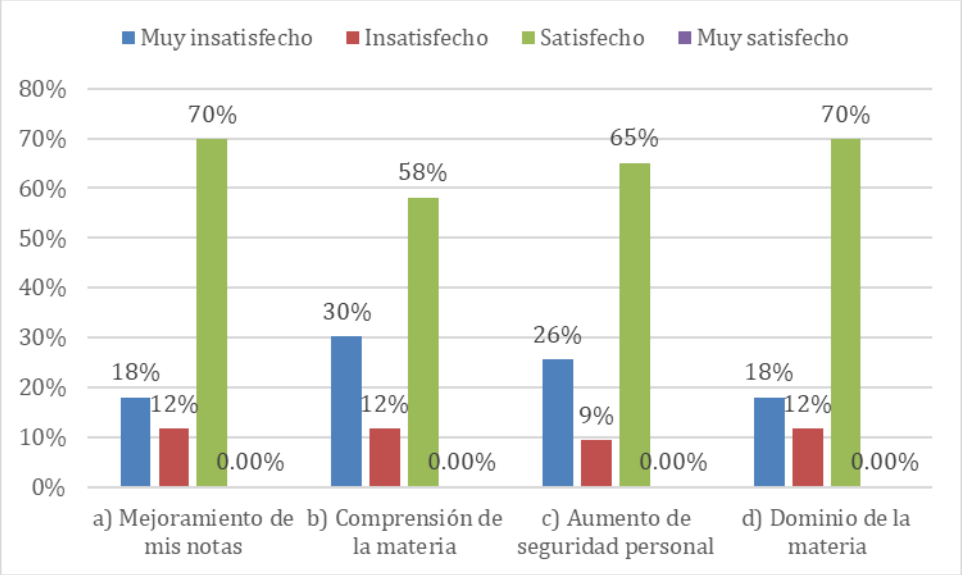
b) Regarding assertive communication: 49% are satisfied and 35% are very satisfied with the tutor's communication; however, 9% of students are very dissatisfied and 7% are dissatisfied. This information shows that the tutor's assertive communication is valued positively by 84% of students, and also reveals that 16% of students are dissatisfied and experience difficulties in this area.

c) Regarding the Subject Matter Mastery category: This category is the most highly valued , with 89% of students satisfied or very satisfied (49% satisfied and 40%

very satisfied). Only 9% were very dissatisfied, and 2% were dissatisfied. This information suggests that subject matter mastery is one of the tutor's strengths.

d) Regarding appropriate internships: 86% of students indicated they were satisfied or very satisfied with the internships provided (49% and 37% respectively), while 9% were very dissatisfied and 5% dissatisfied. This information indicates that the internships provided by the tutor were well received by the majority of students; although there were areas for improvement for 14% who reported feeling dissatisfied.

Figure 2. Personal achievements.



Source: prepared by the authors using data from the ITJMMPyHPV.

Figure 2 shows the results of the sub-variable "personal achievements" derived from peer tutoring, analyzing the following categories: improvement in grades, understanding of the subject matter, increased personal confidence, and mastery of the subject matter.

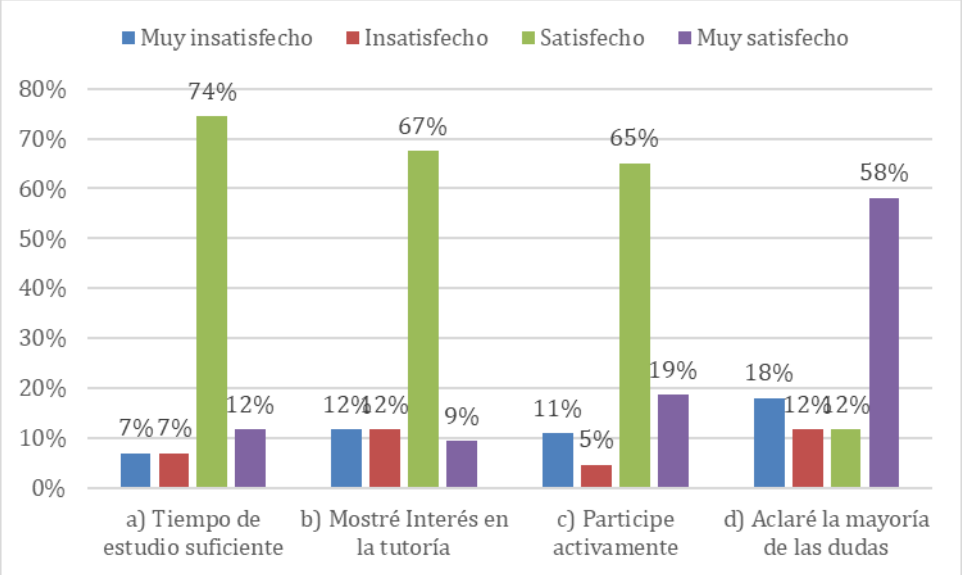
a) Regarding the improvement in my grades: 70% of students were satisfied with the improvement in their grades. However, 18% were very dissatisfied, and 11% were dissatisfied. The fact that 70% were satisfied shows that they value the improvements in their academic performance positively. However, 30% of students were still not happy with their results, which may indicate areas that need further attention.

b) Regarding understanding of the material: 58% of students are satisfied with their understanding of the material, indicating a positive overall level. However, 30% are very dissatisfied and 12% are dissatisfied, revealing that the majority feel they have achieved an adequate understanding of the content; however, there is also a significant percentage of students who face difficulties in this area.

c) Regarding increased personal safety: 65% of students are satisfied, reflecting a positive level in this area. However, 26% are very dissatisfied and 9% are dissatisfied, indicating that a significant portion of students still do not perceive improvements in their personal safety.

d) Regarding subject mastery: 70% of students stated they were satisfied with their mastery of the subject after the tutoring sessions. Similarly to the improvement in grades, 18% felt very dissatisfied and 11% dissatisfied. This information shows that, although the majority of students perceive they have improved their mastery of the subject, a significant proportion has not reached the expected level of mastery.

Figure 3. Student Engagement



Source: prepared by the authors using data from the ITJMMPyHPV.

Figure 3 shows the results of the "student engagement" sub-variable. Four categories were evaluated: sufficient study time, interest in tutoring, participation, and clarification of doubts.

a) Regarding sufficient study time, 74% of students were satisfied, while 7% were very dissatisfied and 7% dissatisfied. Only 12% of students were very satisfied in this area. This information allows us to identify an area of opportunity, so it is considered appropriate to explore the reasons for insufficient study time, and may suggest the need to extend the program sessions.

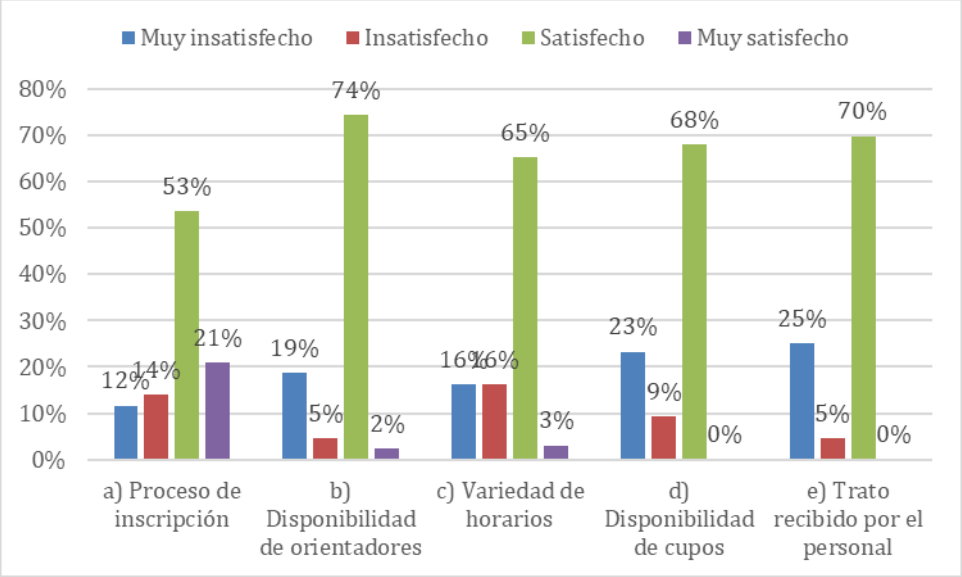
b) In the "I showed interest in tutoring" category, 9% reported being very satisfied, and 67% of students indicated they were satisfied with their level of interest in tutoring, for a total of 76% positive rating. However, 12% were very dissatisfied, and another 12% were dissatisfied. The results provide insight into how students perceive their own interest

in tutoring and may offer clues as to how to improve the attractiveness or effectiveness of tutoring sessions.

c) Regarding active participation, 65% were satisfied with their level of participation, and 19% of students were very satisfied, for a total of 84% positive ratings in this category. On the other hand, 11% of students were very dissatisfied, and 5% indicated dissatisfaction. This information allows us to identify areas for improvement in student participation in order to strengthen strategies that foster greater course outreach. It also helps tutors understand the importance of generating better participation dynamics in their classes and adjust their approaches to support those students who may feel less engaged.

d) In the "I will clarify most of the doubts" category: 58% are very satisfied with their ability to do so, while 12% are satisfied. However, 18% are very dissatisfied and 12% are dissatisfied with this ability. This information allows us to identify both strengths and areas for improvement in the doubt-solving process, allowing instructors to adjust their strategies to better support students in this area.

Figure 4. Program services



Source: prepared by the authors using data from the ITJMMPyHPV.

Figure 4 shows the results of the “program service” sub-variable, where 5 categories were evaluated: registration process, availability of counselors, variety of schedules, availability of spaces, and the treatment received by administrative staff.

a) Regarding the program registration process, 53% of students were satisfied with the registration process, while 21% were very satisfied. However, 12% were very

dissatisfied, and 14% were dissatisfied, suggesting that some students experienced difficulties during registration.

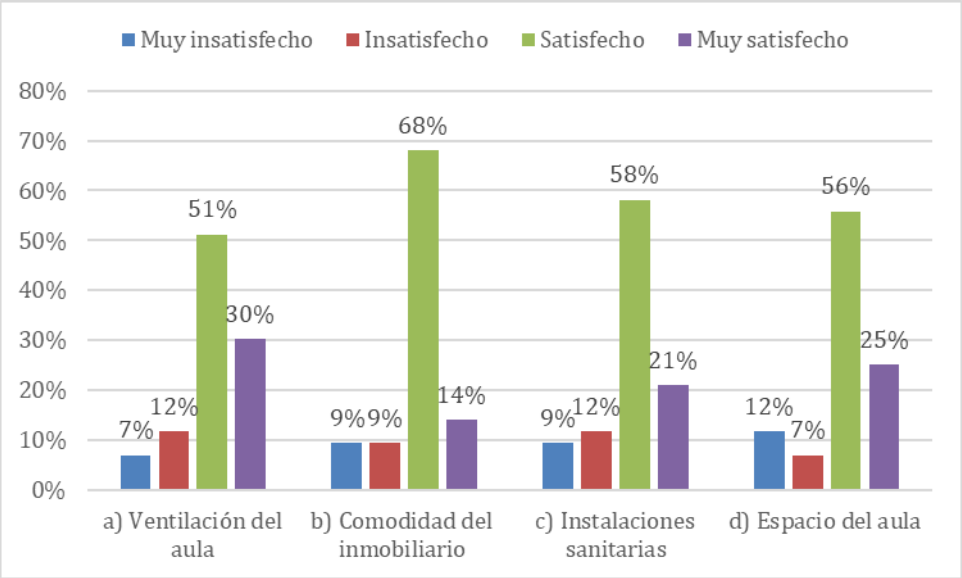
b) Regarding the availability of counselors, the majority (74%) are satisfied, and 2% are very satisfied; however, 19% are very dissatisfied, which may suggest a need for improvement in this category.

c) Regarding schedule variety, 65% of students are satisfied with the variety of schedules, and 3% are very satisfied; however, 16% are very dissatisfied and another 16% are dissatisfied, reflecting that a significant portion of students may be seeking more flexibility in the schedules offered.

d) Regarding availability of places, although 68% are satisfied with the availability of places, 23% are very dissatisfied, and 9% are dissatisfied, which indicates that there is a significant unmet demand for the number of places available.

e) Regarding treatment received by administrative staff: 70% of students are satisfied with the treatment received by staff, but 25% are very dissatisfied, and 5% are dissatisfied, which suggests that there is a significant portion of students who do not feel well cared for by the staff operating the program.

Figure 5. Infrastructure



Source: prepared by the authors using data from the ITJMMPyHPV.

Figure 5 shows the results of the "infrastructure" sub-variable, in which 4 categories were evaluated: classroom ventilation, furniture comfort, sanitary facilities, and classroom space.

a) Based on the data from the classroom ventilation category, it is observed that 51% of students are satisfied and 30% are very satisfied. Only 7% are very dissatisfied,

and 12% are dissatisfied; this information provides a clear picture of perceptions about ventilation and serves to improve the quality of educational spaces and respond to user needs.

b) The comfort of the furniture is the most highly rated aspect, with 68% satisfaction, and 14% stating they are very satisfied, while only 9% are dissatisfied or very dissatisfied. This information confirms that the comfort of the furniture is a strong point, allowing the standard to be maintained and focusing on other areas with greater need for improvement.

c) Regarding the restroom facilities, 58% are satisfied and 21% are very satisfied; however, 9% are very dissatisfied, and 12% are dissatisfied. This information shows that, although the restroom facilities are acceptable to most, there is room for improvement to reduce negative opinions.

d) Regarding classroom space, 56% of respondents are satisfied and 25% are very satisfied; however, 12% are very dissatisfied, and 7% are dissatisfied. This information shows that, although the majority of users are satisfied with the classroom space, it is necessary to analyze the reasons for student dissatisfaction.

Discussion

In a similar study conducted by Zamora-Araya et al. (2019) at the National University of Costa Rica, which used the same instrument, the highest results in satisfaction levels were in the tutor's work subvariable and the lowest in infrastructure. Regarding this study, similar results were presented in the tutor's work subvariable, with the highest satisfaction values; while the lowest-rated subvariable was personal achievements, which differs from the aforementioned study. As in this study, high or acceptable levels of satisfaction could be identified, with average ranges between level 3 (satisfied) and 4 (very satisfied) in almost all indicators.

The tutoring program analyzed by Zamora-Araya et al. (2019) is called Academic Success and Professional Liaison. It began by offering tutoring in mathematics and expanded to other areas such as mathematics, English, chemistry, and computer science. The authors conceive tutoring as personalized attention, with a high sense of commitment from the tutor in the relationship with the student, and mention that "it consists of orienting, guiding, informing, and training the student in different aspects and at different times of their academic career, integrating administrative, academic, psychopedagogical, motivational, and personal support functions" (Molina, 2004, p. 36).

Although the characteristics of the peer tutoring program evaluated by Zamora-Araya et al. (2019) present differences with respect to the one presented in this work, since it offers a broader program for different thematic areas, and addresses administrative, motivational and personal support aspects (not only academic), it is important to highlight that in the academic field, the work methodology is similar, establishing the roles of the peer tutor and the tutee who receives academic support, therefore, it is a relevant reference to compare results with the same instrument.

Chacón-Vargas (2022) developed a similar project applying the peer tutoring methodology in a mathematics course at the Costa Rica Institute of Technology, and concluded that new students who participated in the program obtained better grades and a lower failure rate compared to their classmates.

Other authors have developed similar projects (Fernández et al., 2011; Arcos & Francisco, 2011), arguing significant improvements in academic performance and study habits of students who participate in peer tutoring programs; although, in this study the direct impact on academic performance was not considered, the positive evaluation by the tutees of the presented program, and the results of references documented in the literature review, contribute to valuing peer tutoring as a strategy that strengthens the training of students and that can influence the failure and dropout indicators in educational institutions.

Limitations

The study was limited by the number of program participants, with a total of 43 participants. Another limitation was the subject matter addressed, which focused exclusively on basic sciences, specifically differential calculus and integral calculus. This work was also limited by its focus on program satisfaction. Although some subvariables that provide information on student performance were analyzed, future studies would be recommended to analyze the impact on institutional indicators.

Conclusion

The evaluation results reveal high overall satisfaction with the peer tutor's work at the ITJMMPyHPV. The methodology used, assertive communication, mastery of the subject matter, and the quality of the practical work were positively rated by the majority of students. Therefore, it is concluded that the peer tutor selection and training process was successful, as well as a positive impact from the program's implementation.

The results of the personal achievement subvariant indicate that the two categories with the best results are improved grades and mastery of the subject matter. However, it is worth highlighting one key indicator with low results: "understanding of the subject matter." 12% reported feeling dissatisfied and 30% very dissatisfied. Furthermore, the peer tutor's work was rated positively, but it does not appear to be related to improved understanding for a high percentage of students, suggesting that the lack of understanding is attributed to personal effort or other factors. It is important to monitor this indicator by identifying areas of opportunity within the program that could improve students' satisfaction with their understanding of the subject matter. One strategy that could improve satisfaction with this indicator is to provide training to peer tutors on teaching strategies to facilitate understanding of the topics, hoping to generate a positive impact on this indicator.

In the student engagement category, the majority expressed satisfaction with sufficient study time and active participation; however, significant levels of dissatisfaction were identified in the subvariables of interest in tutoring and clarification of doubts. The category with the greatest dissatisfaction was clarification of doubts, which is linked to understanding of the subject matter and also shows significant levels of dissatisfaction. Therefore, the previous observation of reviewing the program and proposing improvements in the training of peer tutors is reinforced.

Complementing this study with an in-depth interview could provide valuable information to understand the causes of dissatisfaction with the understanding of the subject matter and the resolution of doubts, with the goal of making adjustments to the program based on these indicators, which are essential for the functioning of a program of this nature.

Regarding program services, there are areas of improvement in terms of staff treatment and availability of spaces, which show significant levels of dissatisfaction. Finally, in the infrastructure sub-variable, high satisfaction scores were obtained by the majority of students in all categories analyzed.

Based on the results obtained, it can be concluded that the peer tutoring program offers the following advantages: it fosters the development of students who participate in the program as peer tutors (contributing to communication and socio-emotional skills , and the consolidation of knowledge), in addition to helping them complete their academic obligations; Furthermore, it leverages the institution's available resources (students are competent or advanced in some areas). Tutees with academic difficulties are provided with additional support in class, allowing them to catch up on subjects they are lacking. The distinctive characteristic is that, since the students provide the support and guidance,

a dynamic of greater trust can be generated (compared to that which may exist in the student-teacher relationship), which facilitates the development of learning.

Finally, based on the validation of high or acceptable averages in the levels of satisfaction with the peer tutoring program, it is recommended that its scope be expanded to include content from other subjects in which students experience academic difficulties, taking into account the results obtained to make adjustments and optimize the program.

Future lines of research

As future lines of research, it is recommended to complement the study with a qualitative approach that allows for a deeper understanding of the causes of dissatisfaction in the subvariables with the highest levels. It would also be pertinent to expand the program's content to include other thematic areas that represent challenges and risks of failure for students and evaluate their implications. Finally, a longitudinal study should be conducted to analyze the program's impact on institutional indicators, with cutoff periods that allow for comparing the effects of its implementation.

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