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## IMPACT OF TUTORIAL WORK DURING THE POST-PANDEMIC AT THE VERACRUZANA UNIVERSITY, IN MEXICO

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### *Ulises Gonzalo Aguirre Orozco*

Subject Professor of the Faculty of Engineering, Master in Senior Management. Veracruzana University Veracruzana, Mexico  
<https://orcid.org/0009-0005-7511-2757>

### *Jorge Diaz Enriquez*

Professor by Subject in the Open Education System, Doctorate in Senior Management. Veracruzana University Veracruzana, Mexico  
<https://orcid.org/0009-0004-4797-25>

### *Iván Jesús Díaz Enriquez*

Professor by Subject in the Open Education System, Master in Senior Management. Veracruzana University Veracruzana, Mexico  
<https://orcid.org/0009-0007-0811-4095>

### *Diaz Enriquez Daniel*

Professor by Subject in the Open Education System, Master's Degree in Senior Management. Veracruzana University Veracruzana, Mexico  
<https://orcid.org/0009-0005-0752-7803>

### *Pedro Aguilar Canseco*

Subject Professor of the Faculty of Engineering, Master in Construction Administration. Veracruzana University Veracruzana, Mexico  
<https://orcid.org/0009-0007-5339-7303>

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***Armando Adriano Fabre***

Full-Time Professor of the Open Education System, Doctorate in Legal, Administrative and Educational Sciences. Member of the Legal Research Academic Department  
Dr. Germán Alfonso López Daza  
Veracruzana University, Veracruzana, Mexico  
<https://orcid.org/0000-0002-9699-0365>

***Ramar Mendoza Diaz***

Full-Time Professor of the Open Education System, Doctorate in Legal, Administrative and Educational Sciences. Member of the Legal Research Academic Department  
Dr. Germán Alfonso López Daza.  
Veracruzana University, Veracruzana, Mexico  
<https://orcid.org/0000-0003-2836-2364>

***Carlos Enrique Levet Rivera***

Full-Time Professor of the Open Education System, Doctorate in Public Law. Member of the Legal Research Academic Department  
Dr. Germán Alfonso López Daza  
Veracruzana University, Veracruzana, Mexico  
<https://orcid.org/0009-0002-8784-0549>

**Abstract:** The present research was carried out at the Faculty of Mechanical Engineering and Naval Sciences of the Veracruzana University in the Veracruzana region, where a Comprehensive and Flexible Educational Model (MEIF) is applied focused on the comprehensive training of the student, which consisted of the analysis of the impact of the Academic Tutorial work specifically on the recently created Electrical Mechanical Engineering educational program in 2020, based on indicators such as the rate of students attended, tutors who do not attend, tutorial coverage and number of tutors, in relation to the results of the evaluation of academic tutors and the degree of student satisfaction, for the installation of a cycle of continuous improvement applied to Academic Tutoring, which is evaluated by accrediting departments of the quality of Engineering teaching. Leaving the background of each of the indicators that are transversal to other indicators such as enrollment retention and terminal efficiency for subsequent research.

**Keywords:** Post-pandemic, continuous improvement, tutorial coverage, engineering.

## INTRODUCTION

Good academic practices from the perspective of the accrediting departments of quality in teaching in Higher Education in Mexico, focus attention as part of the main axes on the issue of monitoring the enrollment of educational programs by area of knowledge and the design and implementation of continuous improvement cycles in response to the findings detected, in this sense as far as Engineering refers, the AC Engineering Education Accreditation Council (CACEI) in this particular case in criterion 2.4 Consulting and Tutoring of the category two of the 2018 Reference Manual (CACEI, 2018), considering that quality must be present at all times for the professional development of human beings

and their contributions to society. But above all, good academic practices allow us to face the challenges that arise, such as the abrupt change in the way of life that we face during the COVID-19 pandemic, demonstrating the capacity for technological innovation and human sensitivity. to fight the battle on all the fronts that were opened by this unfortunate scenario, one of these was precisely the accompaniment at all times to the students through video conference sessions, activities in the Cloud and other cyber-pedagogical strategies that were fundamental elements for the transmission of knowledge to students, where precisely the role of the figure of the Academic Tutor was decisive.

## **METHODOLOGY**

The applied methodology is descriptive and quantitative, since findings are analyzed and exemplified in the monitoring of the students' school career through the Institutional Tutoring System of the Veracruzana University that, according to the types of tutoring offered (Veracruzana University). For our research case, Academic Tutoring was determined in the Electrical Mechanical Engineering educational program, which in accordance with current university legislation and which is public in the 2008 Student Statute is constituted as an obligation for students to attend the sessions. of tutoring previously established with the assigned tutor (Veracruzana University, 2008); In this context of ideas we can assert that Academic Tutoring is also constituted as a right of the student in section XIV of Article 168 of the aforementioned ordinance, which literally says:

“Receive academic tutoring during your stay in the educational program. The academic entity may assign a tutor, depending on the availability of academic staff (Veracruzana University, 2008).

As the target population of this research, we have the first-time enrollment of 180 students of the Electrical Mechanical Engineering educational program of the Veracruzana region of the Veracruzana University (UV), which in its curricular design contemplates a standard trajectory of 9 and a maximum of 12 periods. school fees extendable for up to 50% additional periods for vulnerable students, in accordance with the agreement of the Technical Academic Commission on Admission and Schooling (CTAIE) dated (Escolaridad, 2023); In accordance with the Regulations of the Institutional Tutoring System Article 21 section II, at least three tutoring sessions have been established during the school period in the obligations of the Academic Tutor (Tutorías, 2009), which were carried out in the virtual space with the use of video calls or text messages. through the support of well-known applications such as WhatsApp, Telegram, Teams, etc., as a result of these sessions and in accordance with the data sources obtained by a survey in the academic entity with which the aim is to prove that the tutoring sessions for each of the tutorial topics, despite the prevailing conditions, enrollment retention was achieved in that transition from the first to the second period of the first year of the school career. Obtaining the following results:

Likewise, a sample of 164 students from the first generation of Electrical Mechanical Engineering was determined from the target population with a confidence level of 95% and a 2.3% margin of error, to which an anonymous survey was applied to the period August 2020 - January 2021 to evaluate the degree of student satisfaction with the topics that are addressed as part of the Academic Tutoring, compliance with the tutorial work plan and measure the threat variables of the tutors' exercise, such as device failures and media, electrical energy and the availability of software that would

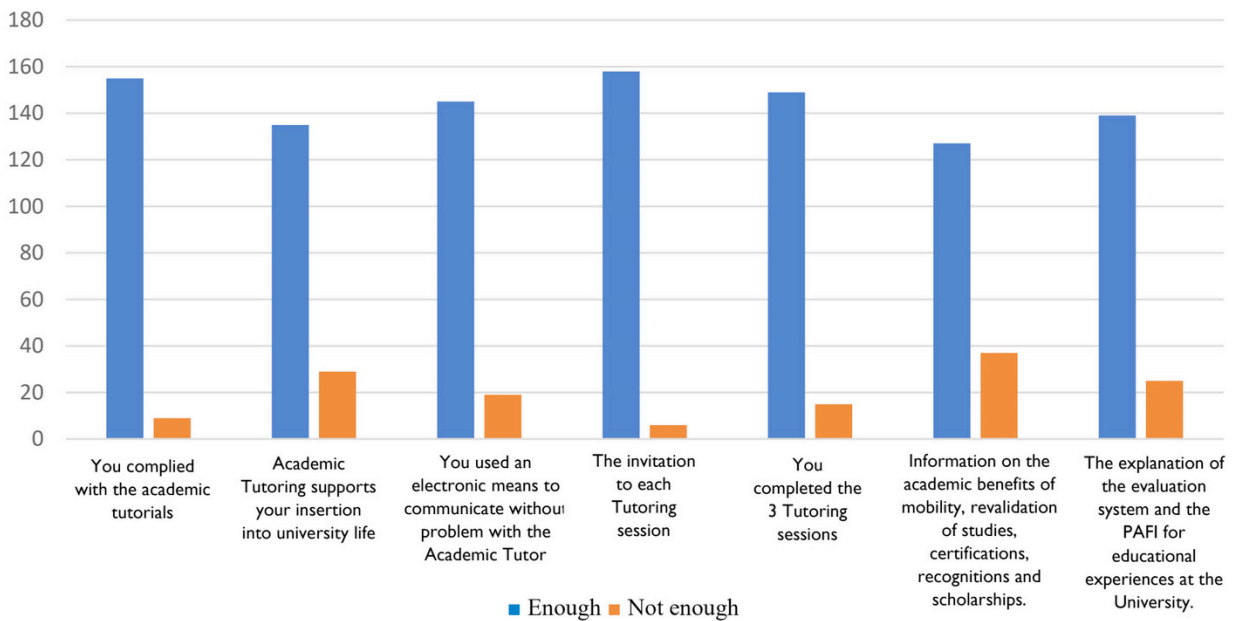
MEIF Population	Assigned Tutees	Mentored with registered sessions	Mentored students (validated by the coordinator)	Tutees who do not attend (reported by their tutor)	Tutoring Coverage	Average number of students served per tutor	Average sessions	Tutors with assigned students	Tutors who registered tutorial activity	Tutors who did not register tutorial activity
180	157	132	132	20	73.33%	7.76	3	17	17	0

Table 1: Source: Registration at <https://dsia.uv.mx/SIT/default.aspx> year: 2021

Answer	You complied with the academic tutorials	Academic Tutoring supported your insertion into university life	You used an electronic means to communicate without problem with the Academic Tutor	The invitation to each Tutoring session	You completed the 3 Tutoring sessions	Information on the academic benefits of mobility, revalidation of studies, certifications, recognitions and scholarships.	The explanation of the evaluation system and the PAFI for educational experiences at the University.
Enough	155	135	145	158	149	127	139
Not enough	9	29	19	6	fifteen	37	25

Table 2. Source: Survey of Electrical Mechanical Engineering students. (Orozco, Encuesta Estudiantes nuevo ingreso 2020 164, 2020)

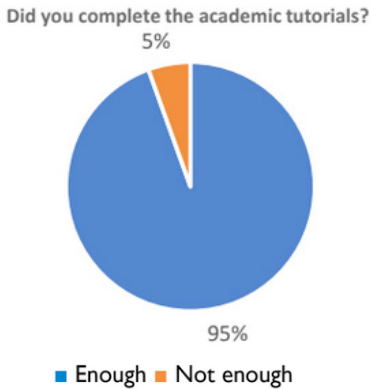
### Level of satisfaction of the Topics covered in the Tutoring



Graph 1. Source: Survey of Electrical Mechanical Engineering Students. (Orozco, New Admission Student Survey 2020 164, 2020)

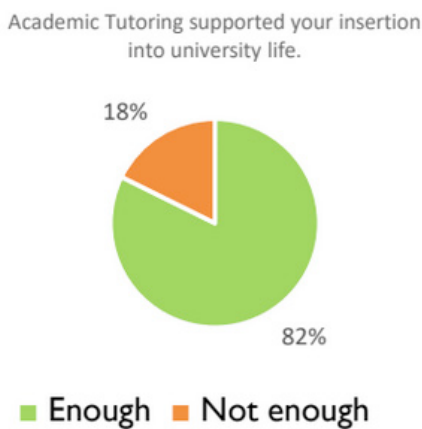
allow the activity, providing the following information as a result:

Disaggregating the themes considered in the survey to 164 students from the target population allowed the percentage analysis of the sample with the following findings:



Graph 2. Source of the Graph: Student survey (Orozco, New Admission Student Survey 2020 164, 2020)

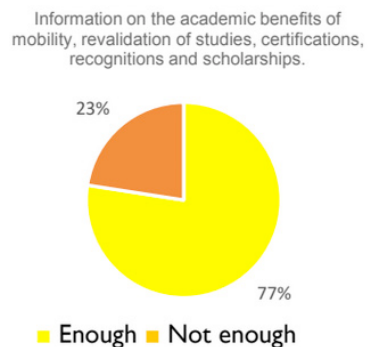
A total of 155 positive responses were obtained for having attended a Tutoring session, 6 responded that they had not received an invitation to the tutoring sessions, which then generated an intersection with the 9 who said they did not attend any tutoring. Another important fact is that 135 students responded that the tutorials had allowed them to better engage with university life.



Graph 3: Source of the Graph: Student survey (Orozco, New Admission Student Survey 2020 164, 2020)

It must be noted that the intermittency of the devices and means of communication had effects on the Tutoring, if we observe that there were 19 negative responses when questioning the fact of communicating through electronic devices with the tutor, it shows an explanation of the existence of mitigating variables of the exercise of tutoring during the peak of the health alert that prevented students and society in general from participating in the activities in person.

With all these inconveniences, the Tutoring managed to reach 145 students through electronic means, which represented 88% of the respondents who listened to all the induction information that contained the topics of the legislation on the other side of the video conference screen. university, organic structure, mobility, scholarships, how the evaluation of educational experiences is carried out, the PAFI, revalidation of studies and certifications, among other topics of direct benefit to the school career and at least 127 students, 77% of whom the sample responded positively that they had received that information. Furthermore, 82% of those surveyed considered Academic Tutoring to be a great contribution in the new school stage and that at that time they were taking it in an atypical way due to the health conditions of COVID. -19.



Graph 4: Source of the Graph: Student survey (Orozco, New Admission Student Survey 2020 164, 2020)

Answer	You complied with the academic tutorials	Academic Tutoring supported your insertion into university life	You used an electronic means to communicate without problem with the Academic Tutor	The invitation to each Tutoring session	You completed the 3 Tutoring sessions	Information on the academic benefits of mobility, revalidation of studies, certifications, recognitions and scholarships.	The explanation of the evaluation system and the PAFI for educational experiences at the University.
Enough	155	139	151	154	151	147	152
Not enough	2	18	6	3	6	10	5

Table 5: Source: Survey of Electrical Mechanical Engineering students. (Orozco, New Admission Student Survey 2020 164, 2020)

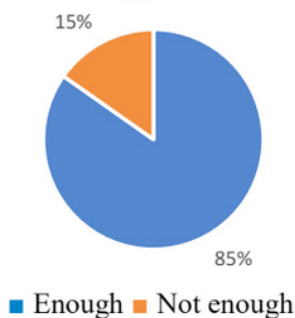
Tutorial theme	Dwell time	Questions	Always	Regularly	Seldom	Never
1.Academic support	1 to 2 periods	-Explain the areas of training, credits, entry and exit profile of your study plan, as a basis for choosing your educational experiences	56.84%	31.58%	9.47%	2.11%
2.Career guidance	1 to 2 periods	-Analyze your vocational decision, that is, compare between the concept you had of your career and the academic and professional possibilities that you will have in the future.	54.74%	33.68%	8.42%	3.16%
3.Personal development	1 to 2 periods	-Recognize your strengths and weaknesses as a student, analyzing your abilities, academic performance, and personal and professional interests.	40%	41.05%	14.74%	4.21%
4.Integration and permanence	1 to 2 periods	-Provide you useful information according to your interests and needs: university services, academic, social, sports, cultural activities, among others.	62.11%	22.11%	12.63%	3.16%
During the sessions, your academic tutor:			Always	Regularly	Seldom	Never
5.Included topics and activities related to your interests, needs and academic history.			50.53%	34.74%	11.58%	3.16%
6.Resolved your doubts or appropriately channeled you to someone who could resolve them.			64.21%	27.37%	6.32%	2.11%
7. Demonstrated availability of time			65.26%	30.53%	2.11%	2.11%

Table 3: Source: Survey of Electrical Mechanical Engineering students. (Orozco, New Admission Student Survey 2020 164, 2020)

Year	You complied with the academic tutorials	Academic Tutoring supported your insertion into university life	You used an electronic means to communicate without problem with the Academic Tutor	The invitation to each Tutoring session	You completed the 3 Tutoring sessions	Information on the academic benefits of mobility, revalidation of studies, certifications, recognitions and scholarships.	The explanation of the evaluation system and the PAFI for educational experiences at the University.
2020	155	135	145	158	149	127	139
2021	155	139	151	154	151	147	152

Table 8: Source: Survey of Electrical Mechanical Engineering students. (Orozco, Encuesta Estudiantes nuevo ingreso 2020 164, 2020)

The exolication of the evaluation system and the PAFI for educational experiences at the UV?



Graph 5. Source of the Graph: Student survey (Orozco, New Admission Student Survey 2020 164, 2020)

The failure rate is another area of opportunity that the Academic Tutoring addresses, in the first instance making known the evaluation system that the MEIF has established within the UV and the option they have of requesting advice or a quick course on a specific topic of the content of an Educational Experience (EE) before subject and that is carried out through the figure of the PAFI which is the Support Program for the Comprehensive Training of the student, of this information 139 students responded positively, which represents 85% of the surveyed population.

Regarding the tutors, the Institutional Tutoring System (SIT) carries out an evaluation of the performance of the tutors where 100% of the tutors participate in valuable information to contrast or ratify the survey and which is detailed below:

As a result, the average opinion is: always 56.24%, regularly 31.58%, rarely 9.32% and never 2.86%

The indicators at the end of the first year of admission of the Electrical Mechanical Engineering educational program were investigated, as of July 31, 2021, the following data was obtained:

MEIF Population	153
Assigned Tutees	139
Mentored with registered sessions	115
Mentored students (validated by the coordinator)	114
Tutees who do not attend (reported by their tutor)	7
Tutoring Coverage	74.51%
Average number of students served per tutor	7.6
Average sessions	3
Tutors with assigned students	17
Tutors who registered tutorial activity	15
Tutors who did not register tutorial activity	0

Table 4: Source: Survey of Electrical Mechanical Engineering students. (Orozco, New Admission Student Survey 2020 164, 2020)

The instrument was applied to the period February – July 2021 to a similar sample of 157 students to the instrument applied at the beginning of the generation, with the following indicators:

Taking into consideration that in July 2021 the situation had already improved, given that the numbers due to COVID-19 were on the order of 10,213 deaths according to a report from the Undersecretary of Prevention and Health Promotion.

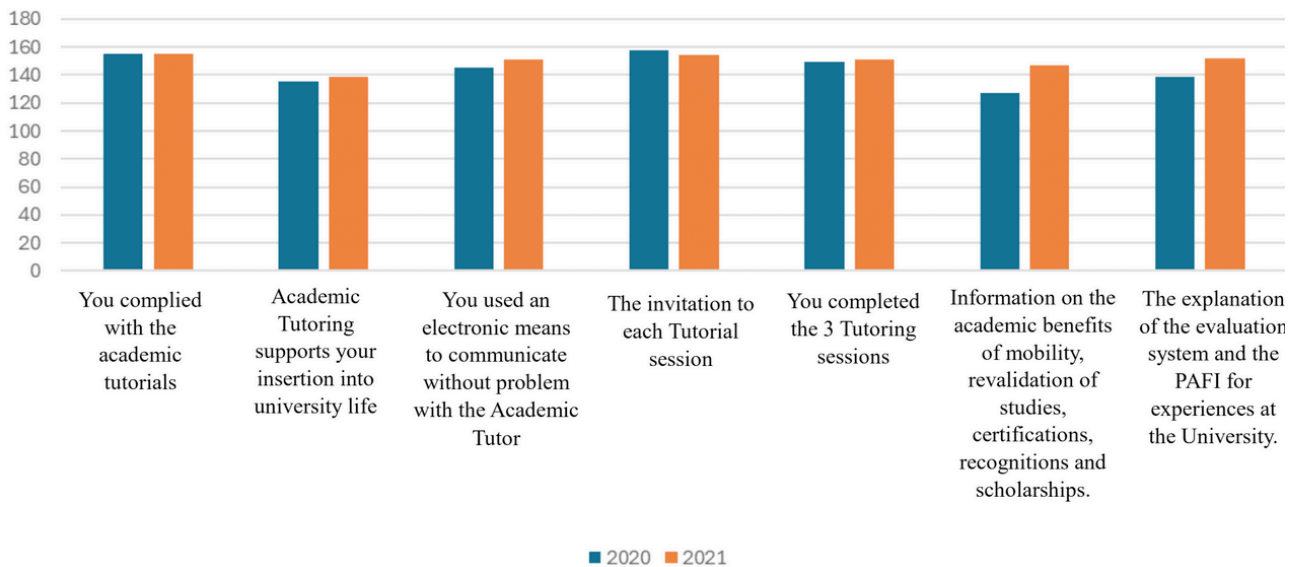
## RESULTS

The information tables that reveal the actions reveal numerical data that quantify the progress or scope in the tutorial topics that have been carried out by the students of Electrical Mechanical Engineering at the Veracruzana University in the Veracruzana region. These hard values can be contrasted to prove that Academic Tutoring had a positive impact on the students but mainly on enrollment retention to additionally support the conditions that the COVID-19 pandemic kept us in. To show this impact we will begin by showing how the indicators were recovered

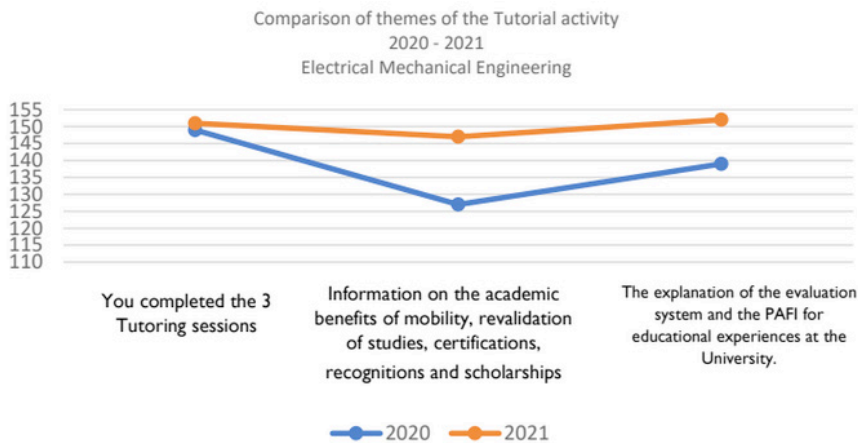
Years	MEIF Population	Assigned Tutees	Mentored with registered sessions	Mentored students (validated by the coordinator)	Tutees who do not attend (reported by their tutor)	Tutoring Coverage	Average number of students served per tutor	Average sessions	Tutors with assigned students	Tutors who registered tutorial activity	Tutors who did not register tutorial activity
2020	180	157	132	132	20	73.33%	7.76	3	17	17	0
2021	153	139	115	114	7	74.51%	7.6	3	17	15	0

Table 6: Source: Survey of Electrical Mechanical Engineering students. (Orozco, New Admission Student Survey 2020 164, 2020)

### Comparison of tutorial topics 2020-2021



Graph 6: Source: Survey applied to Electrical Mechanical Engineering students (Orozco, Survey of Electrical Mechanical Engineering students, 2021).



Graph 7: Source: Survey carried out at the academic entity (Orozco, Survey of Electrical Mechanics Engineering students, 2021).



at the end of the first year. of the generation, as follows:

Although it is true that the school population decreased from 180 to 157, which represents a dropout of 12.77%, which was not due to permanent withdrawal because the conditions for this were not yet met due to the number of periods completed up to that point and other causes. Administrative measures due to sanitary conditions were extended in order to comply with those administrative requirements. This decline can be attributed to economic conditions that began to worsen as a large number of jobs were lost across the country.

Tutorial coverage increased from 73.33% to 74.51% and therefore the number of tutors who did not attend Academic Tutoring increased from 20 to 7 students based on reports from the tutors, making the impact of the tutorial work clear. the coverage and interest in Academic Tutoring.

In the analysis of the results of the surveys it can be resumed that the survey allowed validating the results of the SIT, with the data obtained it is possible to verify an increase in the number of students who are interested in the tutorial activity who obtained a benefit from the information which was provided by the Academic Tutor

Year	Tutees who do not attend (reported by their tutor)	Tutoring Coverage
2020	20	73.33%
2021	7	74.51%

Table 7: Source: Survey of Electrical Mechanical Engineering students. (Orozco, Encuesta Estudiantes nuevo ingreso 2020 164, 2020)

In the previous graph you can see the indicators that have been surpassed in relation to the previous year. Academic tutors must maintain the pace of attention to guarantee greater coverage in tutoring.

To highlight, we have that more students consider that Academic Tutoring in this first year of admission brought them a benefit in university insertion, going from 82% to 88% at the end of the first school year; Now with the tutorial exercise, more students know about topics such as academic mobility, scholarships, revalidation of studies, certifications and recognitions, going from 77% to 94% according to those surveyed, as shown in the following graph:

## CONCLUSIONS

With the present investigation based on the records kept at the Faculty of Mechanical Engineering and Naval Sciences (FIMCN), it can be concluded that the tutorial work really had a positive impact on the Academic Tutoring in accompanying the school career of the students. students of Electrical Mechanical Engineering, even with the threat variables that were identified during the analysis of the case such as the devices and means of communication, the software and hardware required to reach the students who remained sheltered from their homes due to the pandemic. Allowing the essence of Academic Tutoring not to be lost and at the end of the health risk and then with the new normal, they returned to the classrooms of the academic entity, they have already learned well what Academic Tutoring is and what are the benefits that are obtained by attending to scheduled sessions.

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