SCT Proceedings in Interdisciplinary Insights and Innovations. 2025; 3:401
doi: 10.56294/piii2025401

Category: Applied Research in Health and Medicine

ORIGINAL

Electrical hazards in the industrial workshops of the "Atahualpa" Educational Unit in the city of Ambato

Riesgos eléctricos en los talleres industriales de la Unidad Educativa "Atahualpa", de la ciudad de Ambato

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Cite as: Taguada D, Quimiz A, Pizaña A, Ortiz K. Electrical hazards in the industrial workshops of the "Atahualpa" Educational Unit in the city of Ambato. SCT Proceedings in Interdisciplinary Insights and Innovations. 2025 Jan. 1; 3:401. DOI: https://doi.org/10.56294/piii2025401

Submitted: 12-09-2025 **Reviewed:** 27-11-2024 **Accepted:** 03-01-2025 **Published:** 05-01-2025

Editor: Emanuel Maldonado

ABSTRACT

Knowing about electrical hazards is very important because they are the main cause of negative health effects, this is determined by analyzing the risks that may arise in these activities, when performing maintenance of equipment or handling electrical cables, among others, within the workshops of the Educational Unit "Atahualpa" it has been observed that students are exposed to various electrical hazards either by direct or indirect contact when performing their work, Therefore, it has been necessary to make known how important it would be to implement a manual of signage and teach more about the subject to students before performing any electrical work, in order that students have precautions, are responsible and know how to properly use the materials or tools when performing the tasks assigned by teachers, so that this is done correctly and safely, thus avoiding serious accidents within the institution.
According to the results obtained in the surveys conducted both students and teachers agree and see the need for proper signage in the workshops, on the other hand, it has also been seen important, necessary that teachers of this unit speak and make known more about the subject to students as it has been seen that some of them do not know much of the above.

Keywords: risks; electricity; signage; driving; manual.

RESUMEN

Conocer sobre los riesgos eléctricos es muy importante ya son los principales causantes de efectos negativos en la salud , esto se determina mediante el análisis de riesgos que se pueden suscitar en dichas actividades, al momento de realizar mantenimiento de equipos o manipulación de cables eléctricos ,entre otros, dentro de los talleres de la Unidad Educativa "Atahualpa" se ha observado que

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los estudiantes , están expuestos a diferentes riesgos eléctricos ya sea por contacto directo o indirecto al momento de realizar sus labores , por lo que se ha visto necesaria dar a conocer lo importante que sería implementar un manual de señaléticas e impartir más sobre el tema a los estudiantes antes de realizar cualquier trabajo eléctrico ,con la finalidad de que los alumnado tengan precauciones ,sean responsables y sepan utilizar de manera correcta los materiales o herramientas al momento de ejecutar las tareas asignadas por parte de los docentes , para que así esta sean realizadas de manera correcta y segura ,evitando así accidentes graves dentro de la institución. Según los resultados obtenidos en las encuestas realizadas tanto a los alumnos como docentes están de acuerdo y ven necesario contar con una correcta señalización en los talleres, por otra parte, también se ha visto importante, necesario que los docentes de dicha unidad hablen y den a conocer más sobre el tema a los estudiantes ya que se ha visto que algunos de ellos no conocen mucho de lo antes mencionado.

Palabras clave: riesgos; electricidad; señaléticas; manejar; manual.

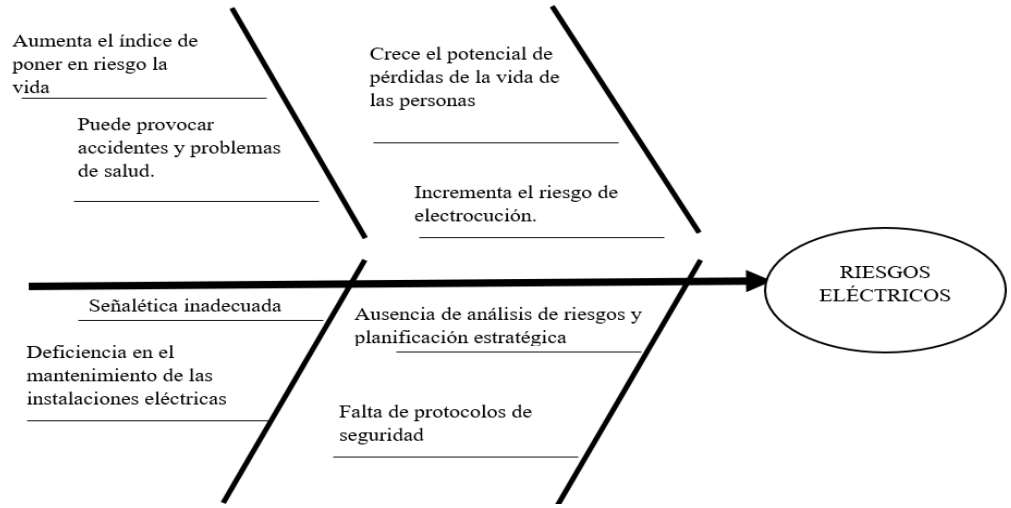
INTRODUCTION

In the Atahualpa Educational Unit located in the city of Ambato, specifically in the degree course in Equipment Installations and Electrical Machines, there are several shortcomings in terms of occupational risk and safety that negatively affect the normal development of daily activities. Within the institution are workshops in the area of electricity: electrical load, distribution, transformers, public lighting and repairs, substations, and the area of load control center.

In the various electrical tests carried out in the workshops in the electricity area, students are exposed to several electrical risks in occupational health and safety. An accident in this area leads to fatal results for students and teachers, as well as employer responsibilities for the Atahualpa Educational Unit based on the legal framework for occupational health and safety in force in our country.

What is the level of risk exposure for students?

Figure 1. Cause-effect analysis.



Source: Author's own creation.

When talking about the electrical risks to which the students of the "Atahualpa" Educational Unit are exposed, the leading cause of the electrical equipment and machinery installations is the lack of maintenance of the electrical installations since the voltage passing through the cables produces

https://doi.org/10.56294/piii2025401

vibrations that can cause the screws of the fuse bases to loosen, causing electric arcs, which is one of the leading causes of fires.

Another cause is inadequate signage in educational institutions, which makes it impossible for students to locate and identify certain means or facilities for protection, evacuation, emergency, or first aid.

Similarly, the absence of risk analysis and strategic planning means that it is unclear what risks teachers, students, and parents are exposed to and the magnitude of these risks in the educational institution.

Finally, security protocols are a fundamental part of the educational institution. They give us strategies with the steps that must be followed to execute security measures, as without one of these, the dangers and risks are highly prejudicial.

Feasibility

The project is viable since the research objectives will be achieved at the end of the study, and possible solutions will be shared with the Atahualpa Educational Unit. On the other hand, this research is being carried out because each of the important aspects is to consider the electrical risks that arise in the institution's daily activities, carrying out the development of the signaling phases that are important in the safety field.

Scientific novelty

At the same time, the research has been innovative because it presents several situations of electrical risk based on the students' reality and aims to provide a solution to each of them. The aim is to improve coexistence in the facilities so that they help to increase the protection of the students and strengthen their learning, protection, and innovation in the students of the institution.

It is important that preventive measures are taken in electrical installations for both students and teachers. Teaching safety and implementing practices within the institution, such as electrical installations, will allow students to learn more about the work they have to do.

Contextualization

In Ecuador, electrical risks are a very relevant issue because any organization can present them and not be exempt since they are those derived from electricity use. In the study, the electrical risks present in the practical aspects of the students who attend the Atahualpa Educational Unit are analyzed, and how this is included in the safety of each one of them, determining the degree of significance in the development of the institution's safety measures and that these have trained by the criteria that may be present in the machinery and equipment found inside the institution and even outside it allowing one of the phases to be contributed to society for the benefit of knowledge within the aspects of safety. The research shows the role of each educational community member, including parents, teachers, authorities, and students.

The aforementioned research is vital because the risks that arise within the institution harm those who use it and involve each of the students. Therefore, it is necessary to understand the various difficulties presented in terms of knowledge and use of the facilities and electrical risks to which they are exposed, and the consequences according to the development of each electrical aspect.

Nowadays, electrical risks are present in all scenarios; that is to say, they are present in large companies and homes. When we talk about electrical risks, we don't just talk about them in institutions, because here several aspects of safety are involved, both for those in charge of the development of technical workshops for the installation of machinery and equipment and even in the use of each implement, it is necessary that the integral part of each and every one of the members of the educational institution is considered, which is why the impact of the research, in previous processes, only the practical part of the use of these implements was sought, without taking into account the integral safety of the students, leading to a direct or indirect exposure to the electrical risks that exist and to not knowing in an adequate way the safety implements that must be used before entering the facilities and maintained during the development of the different activities, this will help in a noticeable way to avoid accidents,

leaving aside the misuse of the equipment, which are part of the safety of each of the educational members. Therefore, it is necessary to investigate the Educational Unit since bad practices on the part of the students, without any technical knowledge in the area of electrical installations, lead to the realization of deficient installations and materials of terrible quality without applying technical criteria; the problem increases considerably due to the lack of knowledge of safety and hygiene at work.

Likewise, using unguaranteed materials and unsafe procedures in indoor installations in establishments due to lack of knowledge leads first to risk and then to personal and property accidents. This could be avoided if the Unit students were to undergo training and testing so that they could subsequently carry out their work on safe electrical installations based on their careers.

The research work aims to improve the safety equipment and signage that must be present in the facilities to provide students with comprehensive, quality safety.

General objective

To assess the dangers that students run when working in electrical installations. This is determined by analyzing the risks that may arise in such activities and is carried out to ensure their safety in the areas where they will be working.

METHODS

Paradigm

After analyzing the problem of electrical hazards at the Atahualpa Educational Unit and the importance of implementing a signage manual for better student performance for the industrial workshops they carry out at the institution in Ambato, Tungurahua province, the research has been carried out qualitatively and quantitatively:

Qualitative: This is a process in which conclusions are drawn from unstructured data that is not expressed numerically or quantifiable.

Quantitative: This is a statistical variable that can be expressed in numerical figures, i.e., measured.

Research method

Documentary

The research was carried out using various bibliographic sources related to the subject, such as web pages, which helped us in a positive way and led to success in terms of what we wanted to investigate.

Fieldwork

A small analysis was carried out on the workshops where the students worked, taking into account all the needs and necessary measures, their opinions, and the importance they believe a signage manual will have in the area.

Population and sample

This is the totality of the samples that will be taken or considered to carry out the research on the subject. For the present problem, the students and teachers of the Atahualpa educational unit have been considered.

The sample

A calculation will be made of the total population with which the present investigation will be carried out.

The population and sample to be taken into account are the Atahualpa Educational Unit's teachers and students in Ambato.

Table 1. Percentage and Sample.

Population	Number	Percentage
Students	**10**	**61%**
Teachers	**3**	**39%**
Total	**13**	**100%**

Source: Prepared by the author.

Table 2. Operationalization of variables.

VARIABLE DEPENDIENTE				
	DIMENSIONES	**INDICADORES**	**ÍTEMS**	**INSTRUMENTOS A UTILIZAR**
Exposición a riesgos eléctricos Es un punto donde se habla sobre la posibilidad de contacto eléctrico que puede sufrir una persona a su cuerpo ya sea por choque eléctrico esto se da por presencia de tención o masas compuestas accidentalmente por electricidad y tención que puede resultar un riesgo para la integridad de las personas que daría como consecuencia caídas o golpes incendios, explosiones originadas por electricidad, choque eléctrico, contacto con tensión.	1. Factores de riesgo	1.1 Conocimiento del alumno de la tarea que va a realizar. 1.2 Calidad del ambiente y entorno de trabajo de las diferentes actividades estudiantiles. 1.3 Nivel de Mantenimientode los aparatos eléctricos utilizados por losestudiantes. 1.4 Estado actual de los sistemas eléctricos de las máquinas y los equipos que al entrar en contacto con las personas pueden provocar lesiones	¿Conocen a que riesgosestán expuestos antes de trabajar con electricidad?	Cuestionario de preguntas
	2.Gestión preventiva frente al riesgo eléctrico	2.1 Identificación y evaluación de las diferentes causas que pueden producir accidentes. 2.2Eliminación y control de riesgos. 2.3 Diseño e implantación de medidas preventivas.	En trabajos en proximidad de líneas eléctricas de alta tensión se adoptan medidas antes del trabajo para evitar el posible contacto accidental	Cuestionario de preguntas
	3.Tipos de electricidad que se maneja en la entidad	3.1 Corriente alterna 3.2Corriente continua	¿Qué tipo de corriente maneja en la Institución?	Cuestionario de preguntas
	4.Elementos de seguridad	4.1 Cumplimiento de las normas establecidas	Las clavijas y bases de enchufes son correctas y sus partes en tensión son	Cuestionario de preguntas
		4.2 Prevención de accidentes 4.3 Capacitaciones a los estudiantes 4.5 Preservación de, instalaciones materiales y medio ambiente. 4.6 Control por parte de los docentes del área.	inaccesibles cuando la clavija esta parcial o totalmente introducido	
	5.Medios de protección colectiva	5.1Comprobadores e ausencia de tensión 5.2 Magnetotérmicos 5.3Diferenciales	Los conductores eléctricos mantienen su aislamiento en todo el recorrido y empalmes y conexiones se realiza de manera adecuada	Cuestionario de preguntas
	6.Uso de EPPS	6.1 Guantes aislantes. 6.2 Ropa de seguridad 6.3Botas de dieléctricas. 6.4 Gafas. 6.5 Casco dieléctrico	¿Cuál de estos implementos EPPS utilizan para realizar trabajos con electricidad?	Cuestionario de preguntas
	7.Factores que condicionan el daño por contacto eléctrico	7.1 Intensidad en mil amperios 7.2 Frecuenciade la corriente 7.3 Resistencia corporal armónicos. 7.4 Recorrido de la corriente	Las tomas de corriente clavijas etc., disponen de una protección adecuada para las condiciones de utilización	Cuestionario de preguntas
	8.Tipos de riesgos eléctricos	8.1 Riesgos por contacto directo	¿Conoce el tipo de riesgo al que estarán expuestos los	Cuestionario de preguntas

		8.2 Riesgos por contacto indirecto 8.3 Riesgos por trabajos en baja y alta tensión 8.4 Riesgos por trabajos en altura 8.5 Riesgos por Trabajos en líneas energizadas y no energizadas	estudiantes ante una instalación eléctrica?	
	9.Niveles de riesgos	9.1 Mortal o Catastrófico (M) 9.2 Muy Grave (MG) 9.3 Grave (G) 9.4 Leve (L)	¿Con que frecuencia se ha generado accidentes eléctricos?	Cuestionario de preguntas

Source: Prepared by the author.

Table 3 Operationalization of variables.

VARIABLE INDEPENDIENTE				
Implementación de un manual deseñaléticas **Son indicaciones gráficas y/o auditivas y/o táctiles, que buscan comunicar a las personas e informar para así facilitar su desplazamiento tanto en espacios peligrosos ya sean abiertos o cerrados, esto se da con el objetivo de que las personas no corran algún riesgo o peligro para así lograr un ambiente estable que pueda en el que se pueda desempeñar diversas actividades de forma segura.**	**DIMENSIONES**	**INDICADORES**	**ITEMS**	**INSTRUMENTOS A UTILIZAR**
	1. Señales deadvertencia	1.1 Normas de uso y funcionamiento 1.2 Información de símbolos al serobservado 1.3 Medidas de las señaléticas según sulugar de instalación 1.4 Reglas de Oro 1.5 Procedimientos de seguridad generalespara líneas energizadas	¿Cree necesario la implementación de señaléticas en el áreade trabajo?	Cuestionario de preguntas
	2. Instrucciones	2.1 Guías de manejo 2.2 Análisis de señaléticas 2.3 Utilización 2.4 Señalización y delimitación en la zona de trabajo 2.5 Sistema de control	¿Cree que sería importante de cómo deben estar las herramientas que se utilizaran para un trabajo eléctrico?	Cuestionario de preguntas
	3. Manual de procedimientos de trabajo	3.1 Planificación 3.2 Organización 3.3 Ejecución 3.4 Control 3.5 Evaluación 3.6 Normas de seguridad	¿Consta con un manual de procedimientos pararealizar trabajos en alta y baja tensión?	Cuestionario de preguntas
	4. Riesgos en el trabajo	4.1 Tipo de riesgos dentro del trabajo 4.2 Los riesgos eléctricos 4.3 Peligros en la realización de pruebas eléctrica	¿Conoce a qué tipode riesgo está expuesto antes de trabajar con electricidad?	Cuestionario de preguntas

Source: Author's own creation.

Techniques and Instruments

In the present project, the techniques used for this research were online surveys aimed at students and teachers of the ATAHUALPA EDUCATIONAL UNIT in the city of Ambato, Tungurahua province, and the suggestion of implementing a safety signage manual to create a safe and reliable work area for students to carry out their workshops or student activities.

Survey

An online survey will be administered to the institution's students and teachers, using questionnaires with objective questions to obtain data on the research guidelines.

Analysis and interpretation of student results.

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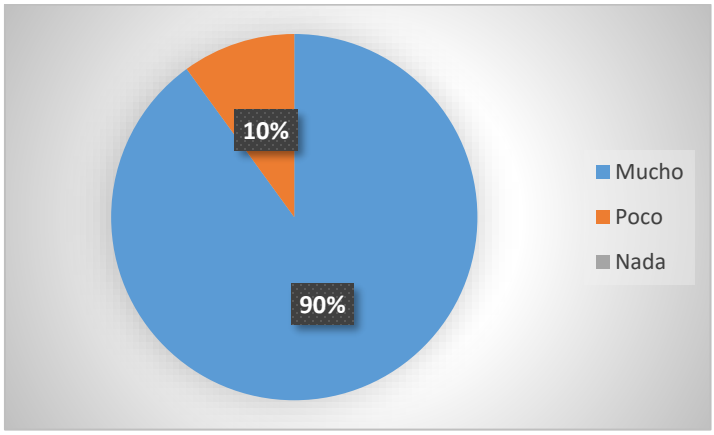
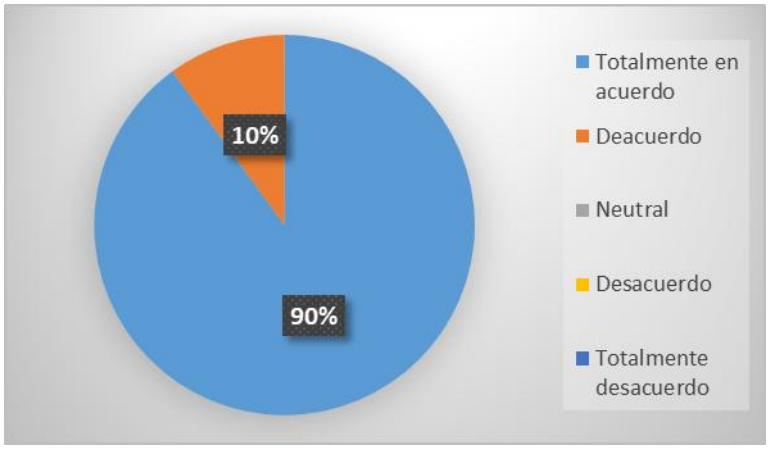
Figure 1. Do you know what risk you are exposed to before working with electricity??



Source: Author's own creation.

According to the research, the following results have been obtained: we have observed that 90% of the students of the Atahualpa Educational Unit are aware of the risks they are exposed to when carrying out electrical work, which shows us that the teachers are adequately preparing the students. On the other hand, it can be seen that 10% know little about the subject, so they should interact with the students about any doubts or concerns they may have about the subject.

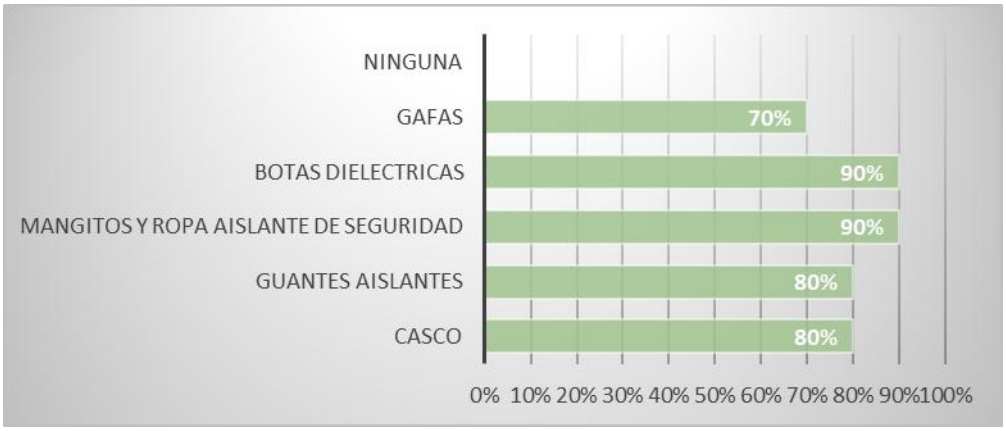
Figure 2. Do you think it is important to carry out maintenance on materials before carrying out electrical work??



Source: Author's own creation.

We have observed that 90% of the students totally agree and 10% agree that it is important to carry out correct maintenance on the materials that are going to be used for electrical work, which shows us that they are aware of the risks that can be caused if materials in poor condition are used, as this will help us to prevent electrical accidents.

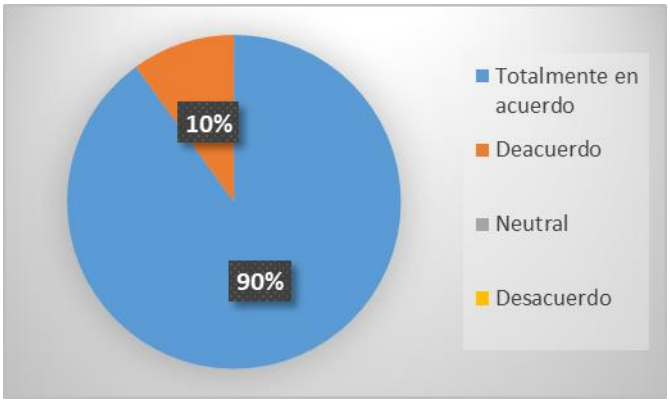
Figure 3. Which of these PPE (personal protective equipment) items do you use when working with electricity?



Source: own elaboration.

The students have told us that according to the survey carried out, 70% of them wear glasses, 90% wear dielectric boots, sleeves and insulating safety clothing, while 80% wear gloves and helmets , which shows us that the majority of students are aware of the importance of wearing PPE for electrical work , it is important to promote and raise awareness that using this equipment correctly will help us to avoid serious accidents to people.

Figure 4. Do you think that signage plays a very important role in preventing electrical hazards in the student community?



Source: Author's own creation.

According to the students' point of view, 90% of them totally agree and the other 10% agree that the signage plays a very important role as it gives us information about the possible risks that exist in an area, knowing the evacuation or safety areas we should go to, and it also tells us where the equipment and systems that allow us to control any emergency are located.

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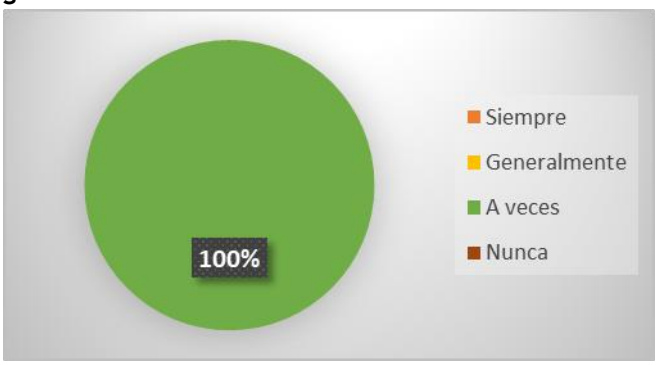
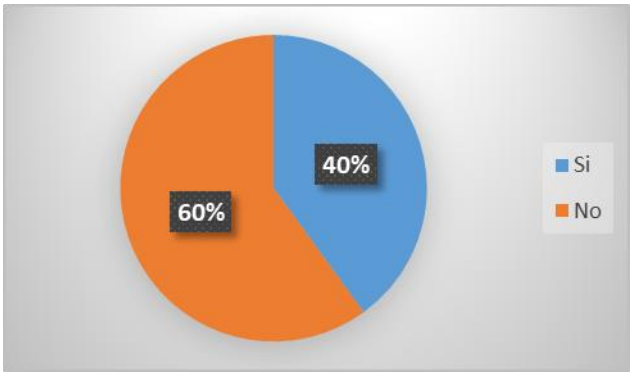
Figure 5. How often have electrical accidents occurred?



Source: Author's own creation.

Given the following results, we have seen that in the educational unit, 100% of the students tell us that electrical accidents have sometimes occurred, for which reason the necessary measures should be taken to prevent accidents such as instructing students on the importance of wearing PPE correctly, always checking the voltage they are going to work with, checking that the cables they are going to handle are in good condition, among other very important points. This will help us to prevent electrical accidents.

Figure 6. Do you know the 5 golden rules for electrical work?



Source: Author's own creation.

The majority of students, 60%, do not know about the five golden rules for electrical work. It is important to make students aware of the importance of applying these rules when carrying out any work with electricity, informing them of the accidents that can happen and how it can make our work easier. Meanwhile, the other 40% are aware of the aforementioned rules, which means it is recommended to provide more information on the subject and how it benefits them if it is followed correctly.

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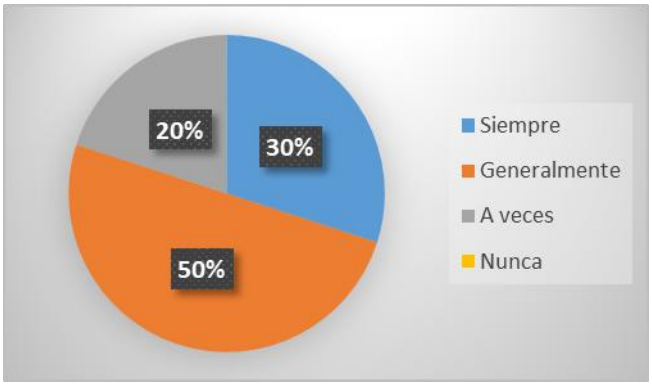
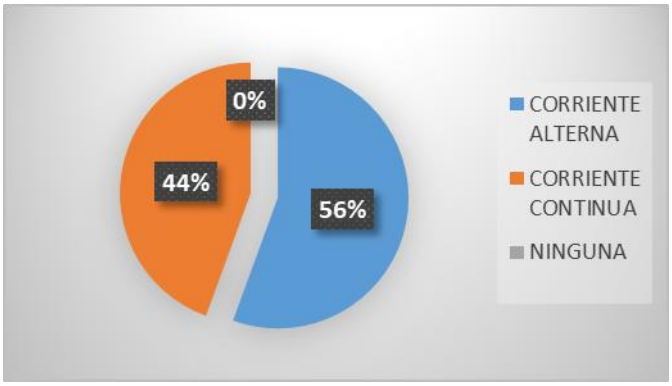
Figure 7. How often is the teacher present when electrical work is being carried out?



Source: Author's own creation.

According to the survey, students state that when carrying out any electrical work or manipulation in the institution, the teacher , 30% always supervises the activity ,while the other 50% say that the teacher is generally present, which is recommended, and observes whether the students are doing their work correctly, 20% say that they are sometimes present. It is very important that any electrical work is supervised by a person who knows about the subject in order to verify that the work is carried out properly and to avoid accidents due to bad practice or handling of electricity.

Figure 8. What type of current do they use in the institution?



Source: Author's own creation.

Of the 9 students surveyed, 5 of them are aware that they are exposed to alternating current in the Atahualpa educational unit, which represents 56%. On the other hand, 4 people know that direct current is used in this institution, which represents 40%.

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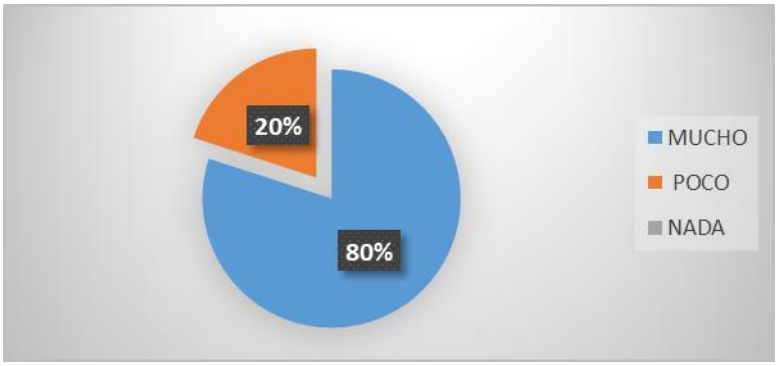
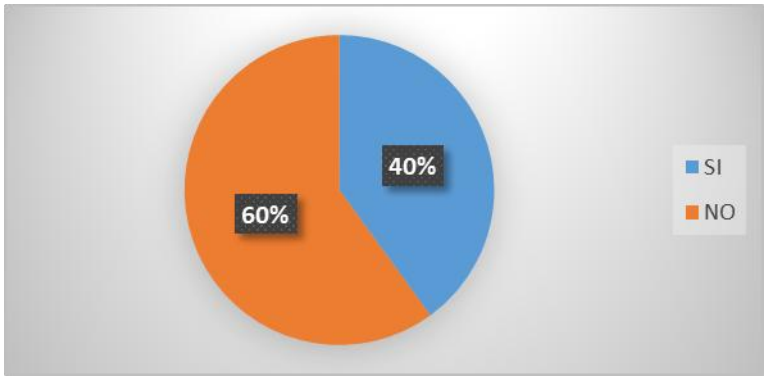
Figure 9. Do you know the type of risk that students will be exposed to in an electrical installation?



Source: Author's own creation.

Of all the people surveyed, 80%, that is to say 8 people, know the type of risk to which they are exposed when carrying out electrical installations. However, 20%, that is to say 2 people, do not know the type of risk to which students will be exposed when dealing with electrical installations.

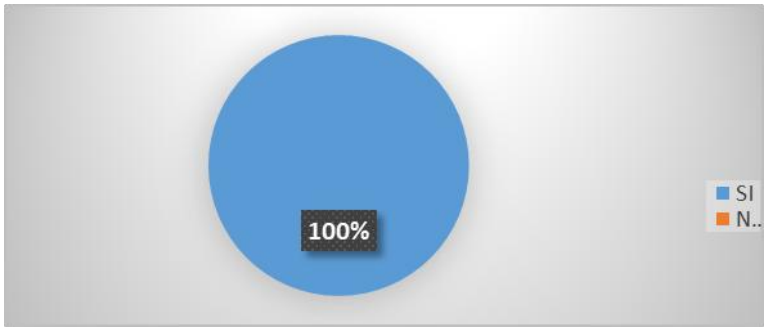
Figure 10. Does it have a procedures manual for carrying out high and low voltage work?



Source: Author's own creation.

The majority of students, 60%, say that they do not have a procedures manual on high and low voltage, this being an essential part of student safety. While the other 40% do have a manual for carrying out electrical work, it is recommended that they be made more aware of the subject and how it benefits them if it is followed correctly.

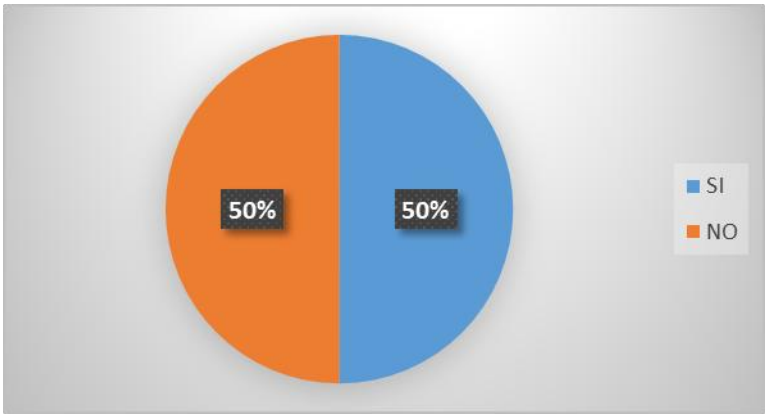
Figure 11. Do you think it is necessary to put up signs in the work area?



Source: Author's own creation.

The total number of people surveyed, i.e. 10, which is equivalent to 100%, agrees that it is necessary to implement signage in the work area of the Atahualpa educational unit. Of the career, installations of electrical equipment and machines, they stated that it is necessary to implement signage in the facilities of the educational center.

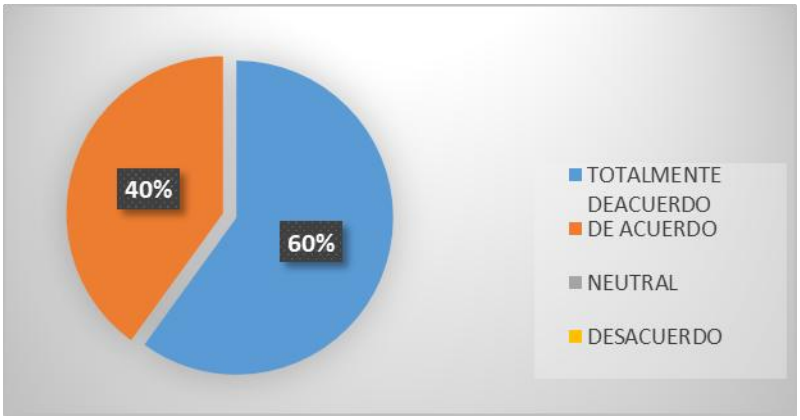
Figure 12. Have there been electrical accidents due to a lack of signage in the work area?



Source: Author's own creation.

Out of 10 people surveyed, 5 of them, representing 50%, stated that accidents have occurred due to the lack of signage in the area where the workshops are held, while 5 people surveyed implied that no accidents have occurred as a result of the lack of signage, representing the other 50%.

Figure 13. Do you think it would be important to have instructions on how the tools used for electrical work should be maintained?



Source: Author's own creation.

Of all the people surveyed, 60% said they totally agreed with having instructions on how the tools used to carry out electrical work should be. Of the remaining 40%, they agreed with what was mentioned in the question in question.

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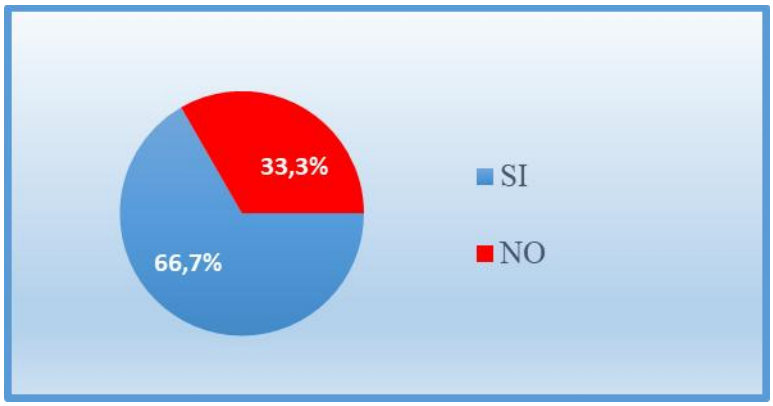
Teachers

Figure 14. In electrical installation work, is compliance with 5 golden rules?

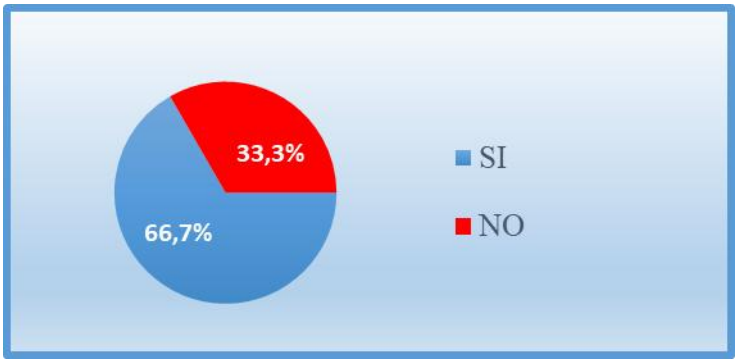


Source: Author's own creation.

According to the survey of teachers at the "Atahualpa" Educational Unit, 66.7% state that teachers apply and comply with the five golden rules when carrying out electrical work, which is very important. They also say that they are able to share this with the students, carrying out practical activities for them to raise awareness of the importance of their use.

Therefore, we obtained a percentage of 33.3%, which indicates that these five golden rules are not put into practice very much, as this is very important, as it will not make it easier to establish safer working practices for teachers and students in the Unit.

Figure 15: Are the personnel who carry out high voltage work qualified and authorized to do so?

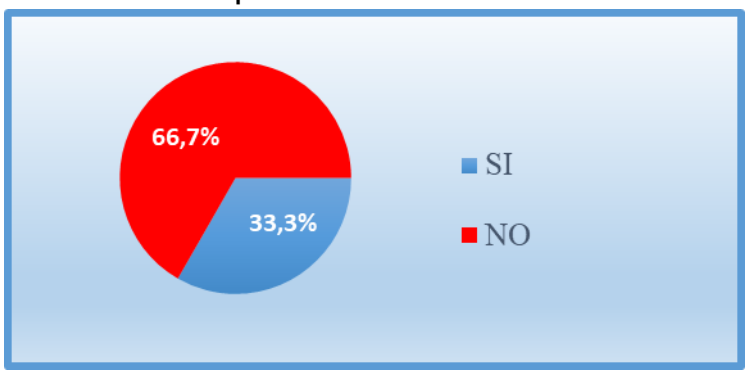


Source: Author's own creation.

With this research, we can observe that there is a percentage of more than 66.7% who carry out their work at high voltage with the authority that corresponds to the work to be carried out, stating that it is important to apply these methods for safe work and thus applying them to the teaching of students, so that they can execute them without any problem when they are on the job, these aspects will always be taken into account since these protective measures will give us more excellent safety.

However, we have a low percentage of 33.3%, which indicates that there are people who do not apply for the respective authorization and are not qualified to carry out high voltage work, so more should be learned and studied about these requirements before these jobs, the use of protection and the necessary and appropriate equipment for these types of work will also be taken into account.

Figure 16. In jobs in the vicinity of high-voltage power lines, are measures taken before the job to avoid possible accidental contact?

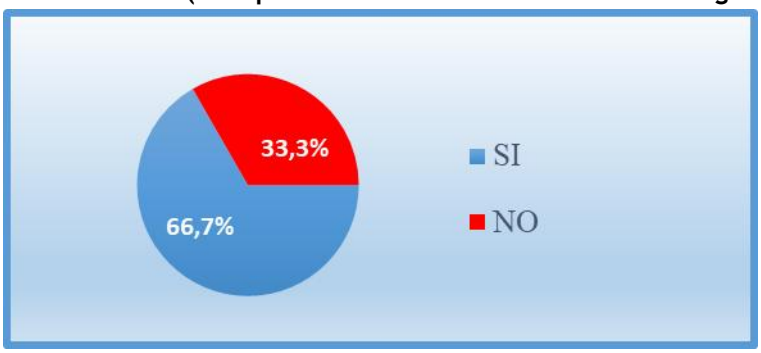


Source: Author's own creation.

The following results show that an average of 66.7% of workers do not adopt preventive measures for work in close proximity, which can have consequences for the person who is going to carry it out. Since these jobs require tools, protective clothing, and handling devices, these aspects must be taken into account when carrying out these jobs.

On the other hand, we have a percentage of 33.3 who, if they adopt preventive measures, must delve deeper into this issue since it is important to take the necessary precautions or implement protective measures, making students aware of this through talks.

Figure 17. Do the electrical panels and receivers provide a degree of protection equal to or greater than IP 2X? (Live parts cannot be touched with the fingers).



Source: Author's own creation.

A percentage of 66.7% has been verified, indicating that electrical panels cannot be handled as these are load centers or electrical distribution boards. Therefore, it is not feasible to touch them. This can be handled by means of supervision by a qualified person with knowledge of this. Protective gloves can also be implemented for handling this machine.

On the other hand, according to the results, 33.3% are unaware of the consequences of handling these machines since these electrical panels, as their name suggests, distribute energy, and poor execution could lead to fatal consequences. Therefore, it is necessary to implement protection methods and measures for safe work.

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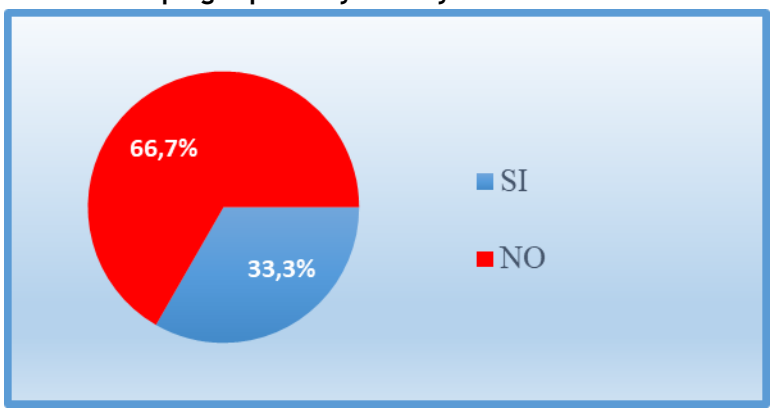
Figure 18. Are the plug pins and sockets correct and are their live parts inaccessible when the plug is partially or fully inserted?

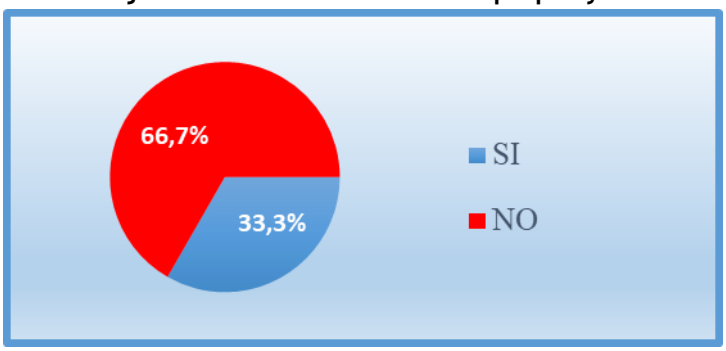


Source: Author's own creation.

We have a percentage of 66.7% indicating that sockets cannot be connected when this plug is already inserted, this can have consequences since we should not use a single socket to connect several connectors or plugs, as this can cause the cables to heat up.

With the following result, which is 33.3%, training can be implemented either through talks or in order to raise awareness and provide more in-depth information about the importance of connectors, as it is essential to teach students in this unit.

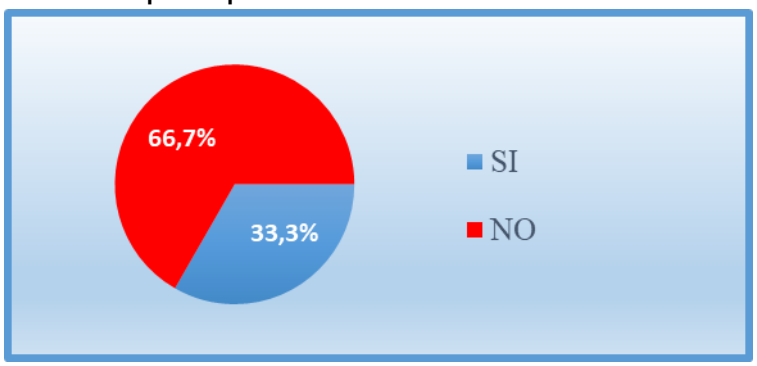
Figure 19. Do the electrical conductors maintain their insulation throughout the route and are the joints and connections made properly?



Source: Author's own creation.

Of the three teachers surveyed, one of them is not aware that electrical conductors maintain their insulation from the circuit and that the splices and connections are not suitable for use in the Atahualpa educational unit. This represents 66.7%. On the other hand, two people know that it is handled in the best way in this institution, this represents 33.3%.

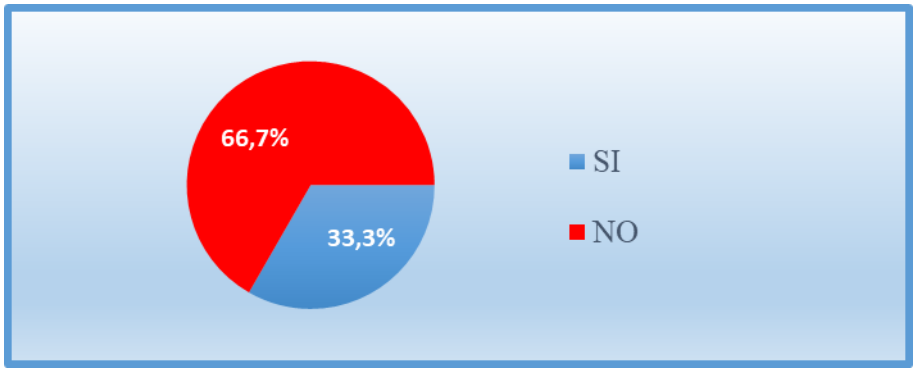
Figure 20. Are maintenance jobs carried out by trained and experienced personnel and are the required protective elements available?



Source: Author's own creation.

Of all the teachers in the "Atahualpa" educational unit surveyed, 33.3%, i.e. 2 people, know that maintenance work is carried out by trained and experienced people and that they have the protective equipment for electrical risk. However, 66.7%, i.e. 1 person, has no knowledge or experience of maintenance work.

Figure 21. Is there a lack of grounding (TN) and fault current cut-off devices (circuit breakers, RCDs)?



Source: Author's own creation.

The teachers of the educational unit, 60.7% of them, say that they are aware that there is a lack of neutralization of the masses of defects on the intensity and that it is a step forward for the students. While the other 33.3% do not know about these issues and need reinforcement in order to be able to instruct the children in the best way.

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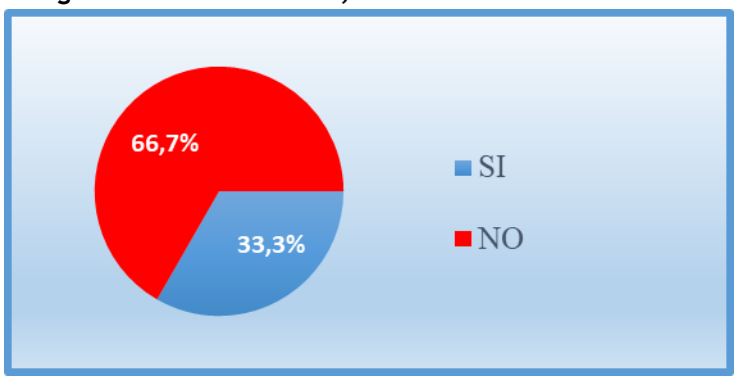
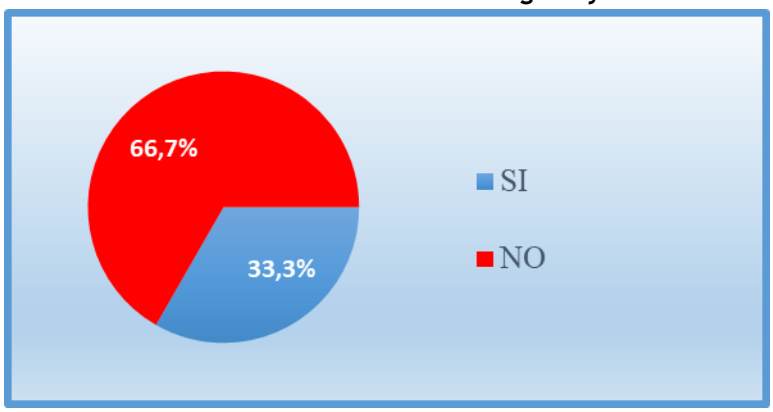
Figure 22. Is there no isolated neutral system (T) and no automatic cut-off devices (fuses or thermal-magnetic circuit breakers, residual current circuit breakers)?



Source: Author's own creation.

According to the results obtained, it can be seen that 33.3% do not lack an isolated neutral system and much less automatic cutting devices in their work area or workshop and 66.7% do lack an isolated neutral system and automatic cutting devices in their area.

Figure 23. Does the general installation have an earthing system (TT) checked annually and residual current circuit breakers arranged by sector?



Source: Author's own creation.

It has been analyzed that 2 of the teachers surveyed, 66.7%, have grounding, a check has been made of switches arranged by sectors of the area and 33.3% have been verified as having grounding, but it is observed that they are not in good condition.

CONCLUSIONS

According to the survey carried out with the students of the Atahualpa educational unit, it has been concluded that it is important to implement signage in the areas where students carry out their activities since sometimes, due to a lack of knowledge about the danger, they are exposed, minor accidents have occurred, which is why the students agree with the implementation of such signage. It is also necessary for teachers to provide more information on the subject of electricity and the rules that should be followed when carrying out any work or maintenance involving electricity.

The evidence collected in the investigation makes it clear that hard work is needed within the educational Institution, given that each member, including parents, teachers, and authorities, is an essential part of it. For this reason, the relationship and coexistence between the students of the

Educational Unit must be strengthened, contributing to the formation of participative human beings who achieve a harmonious coexistence of respect, understanding, ethics, and morality.

When analyzing what exists in the Institution, it is clear that they do not have appropriate signage, fire extinguisher plans, risk maps, evacuation routes, contingency plans, or measurements of risk factors. At the moment, the aforementioned items have been 100% implemented.

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FINANCING

None.

CONFLICT OF INTEREST

None.