

Sustainable carpet: attitudinal strategy with emphasis on sustainable development**Alfombra sostenible: estrategia actitudinal con énfasis en el desarrollo sostenible**

MUÑOZ-ROSALES, Alberto Francisco†*, PÉREZ-JUÁREZ, Gisela, PORTILLO-ECHAVARRÍA, Susana and GARCÍA-ORTEGA, Rosa María

Universidad Tecnológica de Huejotzingo

ID 1st Author: *Alberto Francisco, Muñoz-Rosales* / ORC ID: 0000-0003-2193-0488

ID 1st Coauthor: *Gisela, Pérez-Juárez* / ORC ID: 0009-0005-6963-2967

ID 2nd Coauthor: *Susana, Portillo-Echavarría* / ORC ID: 0009-0008-0290-9951

ID 3rd Coauthor: *Rosa María, García-Ortega* / ORC ID: 0009-0009-9251-8117

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Abstract

The generation of attitudinal strategies in students is fundamental for their integral development and the construction of a balanced quality of life. These strategies allow activating skills that go beyond technical and academic knowledge, as they promote social, environmental and economic awareness. The objective of the research is to identify the perception of the students of the administration career of the attitudinal strategy "Sustainable Carpet" with an active participation. The methodology is based on a qualitative paradigm; interviews were conducted with thirty-two people using a non-probability sample. The main contribution is the creation of an attitudinal strategy with fifteen simple and easy steps with a high feasibility for the case studies belonging to the administration career. Therefore, to generate a degree of awareness it is useful to start from the breach of a human right and this will help to take a personal position in this regard, if it is accompanied by collaborative and cooperative activities, as well as active learning, we are in the presence of learning meaningful and experiential.

Attitudinal strategies, Perception, Active learning

Resumen

La generación de estrategias actitudinales en los estudiantes es fundamental para su desarrollo integral y la construcción de una calidad de vida equilibrada. Estas estrategias permiten activar competencias que van más allá de los conocimientos técnicos y académicos, ya que promueven la conciencia social, ambiental y económica. El objetivo de la investigación es identificar la percepción de los estudiantes de la carrera de administración de la estrategia actitudinal "Alfombra Sostenible" con una participación activa. La metodología es a partir de un paradigma cualitativo, se realizaron entrevistas a treinta y dos personas utilizando una muestra no probabilística. La contribución principal es la creación de una estrategia actitudinal con quince pasos sencillos y fáciles con una alta viabilidad para los casos de estudios pertenecientes a la carrera de administración. Por ello, para generar un grado de conciencia es útil partir del incumplimiento de un derecho humano y esto ayudará a tomar una posición personal al respecto, si se acompaña de actividades colaborativas, cooperativas, de forma activa estaremos en presencia de un aprendizaje significativo y vivencial.

Estrategias actitudinales, Percepción, Aprendizaje activo

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* Correspondencia del Autor (E-mail: alberto.munoz@uth.edu.mx)

† Researcher contributing as first author

Introduction

In many countries there is a social decomposition due to the lack of values and attitudes on the part of its citizens. In view of this, higher education must provide scenarios to modify this situation and contribute to its transformation with planned, systematic actions, clear objectives and competencies.

The generation of attitudinal strategies provides students with the opportunity to activate competencies to generate a quality of life balancing the social, environmental and economic part with their professional activity, the proposal presented here has an added value by using few monetary resources, generating a dialogue, activating a reflection and taking a degree of awareness to a particular situation.

The problem to be solved is to contribute to the definition of an awareness of a social problem which affects and transcends our country, therefore, the generation of an educational process with purposes and actions linked to the decision making of university students is vital for their integral formation.

In line with the above, Baron et al. (2020) ratify the Higher Education Institutions - IES- as the space for the acquisition of values, knowledge and competencies through the participation of all in the generation of solutions that impact the political, social and economic, thus allowing the expected social transformations.

The objective of the research is to identify the perception of the students of the administration career of the attitudinal strategy called "Sustainable Carpet", which is framed within sustainable development and at the same time promotes an active participation inside and outside the classroom during the four-month period from January to April 2023. The research question of this work is how to apply an attitudinal strategy in higher education, which will strengthen the graduate profile of the students of the administration career of the Technological University of Huejotzingo.

Higher education students must make decisions based on their area of knowledge and at the same time follow values and attitudes in accordance with human rights because they work with people.

It is here, where the creation and evaluation of the strategy presented here is justified, because it will help the healthy coexistence among the members of a society and will contribute to solve a current challenge.

Consequently, for the General Directorate of Technological and Polytechnic Universities of Mexico (2010), teaching practice should be focused on learning and on the student, these elements give relevance to the present research, therefore, innovating in attitudinal strategies is required and shapes the university teaching task. Likewise, the SEP (1991) seeks to promote values and attitudes which will be present in the professional, personal and contextual activity, well, this is one more justification to carry out a new way of activating the knowledge to be.

One of the consequences will be a methodology, which will have a series of academic and ludic steps to contribute to the awareness of a particular social problem. The feasibility is high because the human, material, technological and financial resources are available, given that they are a series of actions which do not require large expenditures, on the contrary, existing resources are used.

The realization of the sustainable carpet, is to make students aware of the importance of caring for the environment, as well as to develop their skills, knowledge, dispositions and motives of co-responsibility for the care of society with the economic situation.

It is important to recognize that we are facing a generational crisis, since little has been done for the conservation and care of the environment, which is why students are encouraged to reflect on the subject and make proposals to expose their knowledge with materials that do not affect.

The proposal of the sustainable outdoor carpet allows students to express their feelings on a common theme by capturing phrases with colored chalk, sharing them among them; this allows to know the position that each one has on the subject and reflect on the values and beliefs, each participant represents acting responsibly, the participation of human beings and their development is weighted.

A theoretical framework is presented where the main concepts that allow the construction of the proposal are approached, then the methodology to be followed for the qualitative research is defined, in results the inductive codes found are visualized and from this some conclusions are built.

Theoretical framework

Within higher education it is urgent to take up social issues, which coexist with the business and environmental context, that is, teachers are called to generate new scenarios where the university student is able to build awareness about a particular situation, with Irina Bokova has premises of great value in the educational field, UNESCO (2015) "individuals are called to contribute increasingly more positively to their communities through the promotion of peace, solidarity and respect for others and the environment" (p.3), therefore, teachers can and should generate new attitudinal strategies that allow reflection, analysis and dialogue in a playful framework with the intervention of other members of the educational community.

The aforementioned author refers to give students the capabilities to be creative and responsible with which it is necessary to generate new educational strategies that contribute to mobilize the aforementioned premises, "Education can empower children, youth and adults to actively participate at local, national and global levels, and contribute to overcome the current and emerging challenges of an increasingly interconnected world"(UNESCO, 2015, p.52), this quote, makes it possible to create actions inside and outside the classroom, to change the paradigm of action, but above all to build alternatives having students at the center.

On the other hand, some authors refer to a situation which can be reverted from dialogue and reflection, as long as there is an active participation of the members of society, that is, if we have students today educated with attitudinal strategies and join the knowledge of their own disciplinary area then their integration and application with the other members of society will be perceived, in our "current era, it seems that there is a tendency to crisis, especially of values; part of this crisis may be due to the excessive use of scientific and technological advances, without considering the impacts on humanity and the environment" (Partidas et al. ,2016, p.17).

In addition, attitudinal strategies should go from the simple to the complex, with this the student will have the opportunity to clearly understand knowing how to be, but always moving forward relating it to what happens to him in his environment or in his person, that is, the experience and explanation from his past or present, will enable him in the future to make a clear decision of right or wrong "for an attitude to be consolidated and expressed clearly it is necessary that it is accompanied by the necessary conceptual progressions. And on the other hand, re-signifying one's own experience allows a change in attitudes and value criteria" (Pineda- Alfonso, 2017, p.371).

Likewise, to understand education for sustainable development is to balance their personal, academic, professional, social, international or global performance, or other with a performance attached to values and attitudes valid in a society, that is, "competence that empowers students to make informed decisions conducive to environmental integrity, economic viability and the construction of a just society for current and future generations, respecting cultural diversity". (UNESCO, 2020, p. 30), and it is here, where a student member of a society must see the now without losing sight of the negative effects caused by making a decision.

At the same time, with Estrella and González (2017) manifest a change within society, before the search for economic indicators in a positive way, such as the gross domestic product at whatever cost, today the change is to generate actions to generate a welfare in the population and the environment, that is, productivity taking care of people to acquire better standards of living without permanent damage to ecosystems.

At the same time, a great variety of teaching and learning strategies are used in classrooms, which seek to promote meaningful and solid learning, in certain educational institutions "with older students there is a tendency to suspend high levels of active learning" (Silberman, 2006, p. 8), this causes low student participation, however, it is possible to create attitudinal strategies with an approach focused on activity, collaboration and constructivist participation, which generates an approach that takes into account the other members of the educational community.

Simultaneously, in the teaching role, sometimes certain traditions are followed and consequently, "another reason why learning is not active enough among older students is that teachers feel constrained by their subject, and are also pressured by the limited time they have to teach it" (Silberman, 2006, p. 8). 8), the variables mentioned above are present in some institutions, however, when a student is motivated, enthusiastic and with clarity in the objectives to build within a collaborative, cooperative and open dialogue environment there will be an active and constructivist participation because the student feels to be the center of the attitudinal strategy.

Renowned authors consider of great importance learning accompanied by active actions, where the student takes a participatory and constructivist role, this obliges the university institution to encourage and allow scenarios with playful activity, with which "the importance of promoting interaction between teachers and students, as well as among students themselves, with the management of the group through the use of cooperative learning strategies" (Díaz-Barriga and Hernández, 2010, p.27),

which is vital to transform and at the same time contribute to obtaining favorable results and elements that will allow students to make decisions in their future performance.

Similarly, attitudinal learning or values should follow certain parameters, because they go to the performance of the human being and should be treated differently from the conceptual, Díaz-Barriga and Hernandez (2010):

Teaching cannot be focused on the repetitive reception of factual or declarative information, but requires meaningful learning experiences that allow not only to acquire valuable information, but that really affect the behavior of students, in the manifestation of affection or moral emotion, in their ability to critically understand the reality around them, in the development of specific skills for dialogue, self-direction, active participation, cooperation or tolerance. (p.60).

Thus, an attitudinal strategy must innovate in the resources to be used, in the participation of the students, the results to be generated, the actions with the other students, the personal activities, in the place to be used, the experiences to be generated, but above all in the capacity and acquisition of new competences that will allow the healthy coexistence in society, the environment and in their private, public or social organizations.

Thus, it is proposed the existence of an ethical commitment of the teacher in his teaching practice, that is to say, he must promote values and make human rights the solid base to generate good living, with which we agree. Given this, it is necessary to have enough strategies to achieve this goal, being relevant to innovate and create academic alternatives to achieve these social competencies, Terigi (2013).

For further clarification, Gutiérrez (2020) expresses the new role of the teacher, from identifying a problem, new solutions are provided to improve classroom intervention, but it is important to start from a reflective and proactive process where the objectives are clear and the academic products contribute to educational training because the competencies must be well defined.

Methodology

The research is developed in a qualitative approach, because it seeks to identify the perception of students and from this to build its evaluation, within the premises to be taken up from this type of studies, "it is oriented to learn from experiences and views of individuals, to value processes" (Hernández et al., 2018, p.361), with which it seeks to understand the experiences of the environment generated by the attitudinal strategy "sustainable carpet". The case studies are students of the Management career, which are in an age of 20 to 24 years old, enrolled at the Technological University of Huejotzingo in the state of Puebla of Mexico. Thirty-two people were interviewed out of a total of 40 students. The place where the strategy was developed is the municipality of Huejotzingo, which is considered according to data from Data Mexico (2023), with 19.2% of its graduates coming from the aforementioned higher education institution, which reflects its importance in this region.

The interview was conducted with open-ended questions, which were applied during the four-month period from January to April 2023. A non-probabilistic convenience sample was used. As a processing technique, lists of terms and words in context were used, that is, the data were analyzed based on the use of inductive codes.

To achieve rigor in the present investigation, the researchers reviewed the data alternately, with the aim of achieving congruence of the results and avoiding biases.

The attitudinal strategy of the sustained rug was carried out with the following steps:

1. Selection of an attitudinal theme, in our case we chose human rights.
2. Sending educational material to their personal mobile devices.
3. Analysis with positive and negative examples contrasting with human rights in a round table format.
4. Selection of a human right that is not being fulfilled according to the student's perspective.
5. Construction of a personal sentence.
6. Group discussion on the student's sentence.

7. Reflection of personal sentence in collaborative work teams.
8. Teacher mediation and sentence revision.
9. Personal sentence adjustment by the student.
10. Simulation of sentence writing in the schoolyard using a square of 3 meters x 3 meters.
11. Writing of all students in the school yard with chalk and decoration according to their drawing skills, leaving a corridor or hallway for other students to pass through.
12. Students from other groups walk through the corridor created.
13. Constructive dialogue based on explaining the phrase placed in the schoolyard to other students of the administration career where the selected human right, the situation of the context and the personal phrase are expressed, with an emphasis on cooperative work.
14. Closing strategy of positive and negative elements in the classroom. And its application of phrase in their daily life, professional and with their environment, looking for scenarios transformer new scenarios.
15. Dissemination of results in institutional media for an impact to the entire university community.

This methodology can be followed by selecting an attitudinal theme, in our case human rights was the central theme and at the same time it was within the framework of the UN Women's Day, thus linking a knowledge of being with a current problem of the region, but with an active participation of students and teachers in order to learn to transform oneself and the present and future society, being premises of sustainable development.

At the same time, the strategy can be seen with the three dimensions of sustainable development from indicators:

Social:

- Forty students reflected on human rights in a constructive way.- Eighty students dialogued on a phrase created by their fellow students.

Environmental:

- Each student used three chalkboards which are biodegradable.
- No use of paper for the strategy, zero sheets of paper.

Economic:

- Students bought chalk at stationery stores in the region, spending approximately 9 pesos or half a dollar, i.e., encouraging local consumption.

Results

When we hear the word strategy, our brain automatically takes us back to scenarios of war, economy, sports and even video games, understanding that by developing and applying it we are doing something different, unique and disruptive to what we are commonly used to.

As far as educational strategy is concerned, far from talking about a meaningless adaptation, we should understand it as focusing all the means to achieve a common competence, in other words, directing all activities to achieve an identifiable, measurable and achievable objective that helps to meet the goals set at the beginning.

According to Alvarez, (2003), the strategy is the project or program that is developed on a certain basis to achieve the proposed objective. In order for this study to be successful, the structure and internal processes of the case study were defined with the expectation that they would produce positive effects on its performance and results.

In general terms, the general result of this test is different from what is commonly worked in the classroom, since a topic that has a direct impact on human rights is being addressed, specifically with the female and male groups, resulting in a high participation of the subjects of the study, considering in turn a positive scenario and acceptance of this analysis strategy.

The majority opinion of this case study was to perceive this technique as innovative because the knowledge was acquired outside the classroom, identifying the competence achieved immediately when the phrase was captured as the final result in the sustainable carpet, which in turn encouraged teamwork, obtaining a reflection from two areas.

The first approach was a group criterion where empathy was practiced, the identification of roles in a team and active listening to be able to generate the group opinion being exposed to the rest of the working groups; the second approach allowed to identify and expose ideas in a personal way, while respecting the opinion of the rest, improving and providing new knowledge on issues that are latent in society.

The students immersed in the activity allowed the creation of a space for reflection given that the dialogue was achieved in a binary and even group manner since they were able to adopt new ideas and even managed to strengthen their own. This was achieved because the activity was carried out in an environment of equality.



Graphic 1 Strengths of the strategy

Source: Prepared by the authors based on interviews conducted from January to April 2023.

In response to the question, "What do you think are the personal benefits of the sustainable carpet?", the answers are very broad, see Graph 2, the code identified with the greatest predominance is "reflection", with which the students confirm the existence of a reading, the construction of sentences and a personal awareness of a problem. Secondly, they expressed, it contributed to learn the concept of "non-discrimination", thirdly, a benefit perceived by the students was generated a "respect" and the time allowed to reflect on the "value of women" with which are positive indications of the actions taken, fourthly, they learned of "human rights" and generated a "conscience", these findings confirm the role of the teacher in teaching values and human rights, Terigi (2013).

Fifthly, of importance from what was done with the interviewees, the strategy helped to obtain "other perspectives", there being a "learning" and at the same time, "actions against violence" are necessary, thus complying with what is expressed by UNESCO (2020) in relation to the construction of just societies.



Graphic 2 Benefits of the strategy

Source: Prepared by the authors based on interviews conducted from January to April 2023

A question asked to the students, what is your perception of violence against women, the data is presented in Graph 3, the code with the highest predominance is "unacceptable", in second place "do not allow it anymore".

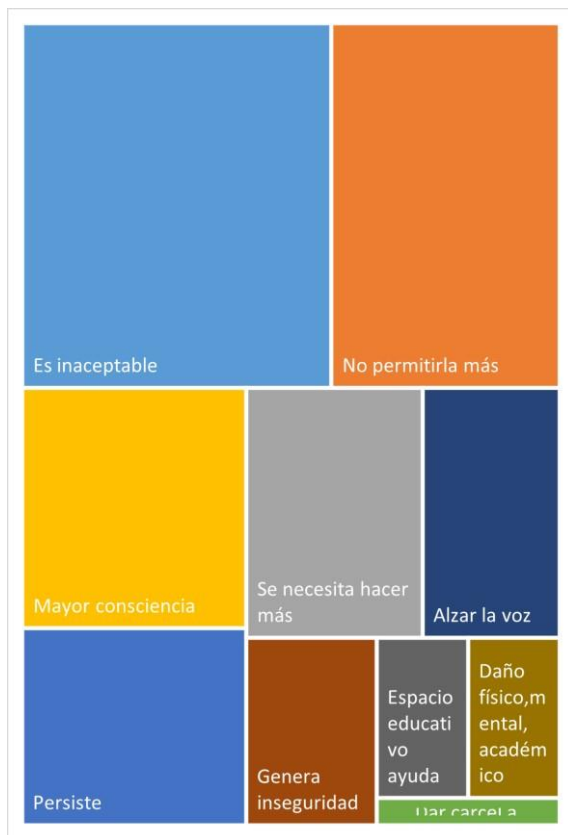
These elements are responses that should and can be addressed by education and it is necessary to carry out planned, systematic and experiential actions to achieve attitudinal and meaningful learning.

Clearly in this problem it is necessary to generate a "greater awareness" and in the region "it persists" and "more needs to be done", with which students ratify the idea of UNESCO (2015), where it is necessary to have an active participation before this situation and the idea of improving in our environments it is possible to reverse the situation, but it depends on each one, therefore, the role of the teacher is, not to separate the knowledge proper to the career with the topics of human rights.

The question makes visible the need to "raise our voices", this is a perception of great importance due to the fact that the participants consider the need to not remain silent and ask for support in these situations.

The attitudinal strategy contributes to give strength to all those involved in this problem when applying human rights.

The interviewees consider the existence of "a generation of insecurity" with which it manifests itself in a personal, professional, social or other way, this code forces a vital action, channeling students who have this problem to other areas of the university institution, such as the psycho-pedagogical department for being the experts or medical area, the strategy contributed to clarify the purpose of these.



Graphic 3 Perception of violence

Source: Prepared by the authors based on interviews conducted from January to April 2023

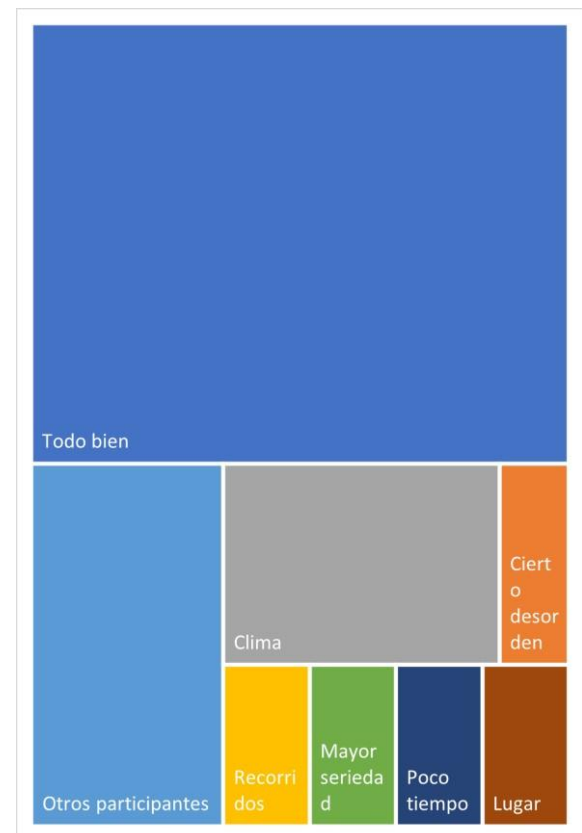
In response to the question "What did you not like about the sustainable carpet?", the results are shown in Graph 4. Firstly, the answer "everything is fine", thus the planning and development of the strategy is satisfactory and at the same time the premise of Silberman (2006) on active learning is fulfilled, because the purpose is to have the student as the center and the construction of activities is done individually, in collaborative teams and cooperatively with other students in classrooms different from their own.

But there are areas of opportunity, the "other participants" are identified, that is, some students of the career did not take it with the required seriousness, they did not give the value of what was being done and that forces to improve in the following editions of the strategy.

Thirdly, "the weather" is a factor to be reviewed, since it is done outdoors, there are weather conditions typical of the region, which affect and impact, undoubtedly it is necessary to take care of this situation, in subsequent occasions it will be done earlier to take care of the integrity of the students.

When working with human beings it is always necessary to continuously improve, within the suggestions are "some disorder", this because at the beginning the students did not know the corridor to go through, undoubtedly it is necessary a team of teachers with more training and a global vision of the activity, "routes" it is necessary to place some kind of signage for the progress of the educational community, "more seriousness" some students did not express this concept and empathy with the students who wrote their sentences, "little time", the activity was developed in one hour for writing and another for dialogue in an intensive way. The "place", as it was a school yard, had some discomfort, being elements to be taken care of in the next editions.

It is worth clarifying that 40 students wrote their sentences, each one took a square of 9 square meters, the extension of the whole strategy was 360 square meters and the other students who dialogued in the school yard about the sentences were about eighty people.



Graphic 4 Things to improve in the strategy

Source: own elaboration based on interviews conducted from January to April 2023

As a process of methodological triangulation, we present some of the phrases constructed during the strategy, Mercedes, "Perseverance is the key to success, therefore, women should not forget it", Ana Karen, "I deserve dignified treatment without abuse", Anahi, "I woman, I am free to choose who to marry", Marlene, "We should never give up, much less lose hope", Lupita, "Women are born free and remain free", Elena, "The art of teaching human rights is the art of helping to discover", Xóchitl, "We are an example for other women, we must show that we are capable of achieving everything", Fabiola, "If we do not advance the world stops, human rights are the path to follow today and always", Anahí, "You do not select your family but your partner, yes, his way of being, yes, the way he treats you, yes, good luck! "Esmeralda, "I am a woman, I have the right to security in all its forms", Juan, "Knowledge does not depend on gender, nothing should stop it". With the contributions it is possible to infer in that the social problem is very present in this region and as teachers we must build scenarios to reverse this situation, that is, learn to transform oneself and the environments, thus responding to the call of education for sustainable development for educators and educational institutions.

Pablo, "Pay attention: No one should be silenced, everyone should be listened to", Karen, "Every free woman leaves fear behind and faces her destiny with human rights", Ivonne, "I am free to have my own opinion and to be able to express it", Gaby, "Something clear, women are free and nothing should change it, today and always", Kevin, "Staying silent is the worst torture", Uriel, "Enough, I want to live, not to think that I must survive", Salome, "Not one more woman humiliated, neither by her gender, nor by men", Dulce, " Women are free, we want to live without fears or fears", these ideas agree with Pineda-Alfonso (2017), because the author seeks to give a new meaning to an attitude from his experience. The contributions are diverse and strengthen values and attitudes in the foreground, it is necessary to continue with academic work to consolidate this meaningful learning.

In the image of Figure 1, the participation of a group of students around the constructed phrase is appreciated, clearly a feeling of liking in the realization of the sustainable carpet is visualized.



Figure 1 Participating group

Source: Own elaboration April 2023.

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Conclusion

The objective of the research was fulfilled by identifying the perception of the student community, as well as their active participation, these elements are fundamental for the strategy because they are evidence of the actions carried out, but above all they are evidence of learning. There is an acceptance of the "Sustainable Carpet" strategy because most of them managed to follow the steps and contribute with their contributions at different times, but all of them concluded with the innovative strategy.

These steps are considered fundamental, but the student must apply them in their daily and professional life and within their society, that is, it has an immediate utility, this happened for men and women without distinction, with this there was a personal construction from what happens in the environment, being a success factor for the development of the proposed strategy. In conclusion, the strategy is viable for this group of students because the steps followed contribute to their attitudinal learning.

The strategy generated can be adapted to a specific topic, in our case we took human rights, but it is possible to take another gender or attitudinal topic, likewise, the steps followed have an active learning and the teacher at all times is in the background, building his proposal with the student, but the student makes his decisions at all times, that said, the fifteen steps followed make up a useful methodology for this generation of students.

The value of the strategy is to make use of existing resources such as mobile devices, internet of the institution, active participation of students, dialogue with other students of the career, school playground, university dissemination system, all of them aligned to the profile of graduation of the career because critical thinking, leadership, empathy, decision making was used and at the same time, it was an activity within the action plan to reduce school dropout, this because it helps integration between different school groups, therefore, there was a high degree of feasibility in its implementation and deployment of playful activities.

By developing these competencies, students acquire skills to interact effectively with their environment, understanding the importance of their professional activity in relation to society, the environment and the economy. This implies a proactive and responsible attitude, oriented towards the search for sustainable and equitable solutions.

By balancing the social, environmental and economic aspects, students not only prepare themselves to perform efficiently in the workplace, but also contribute to the construction of a more just and sustainable society. Awareness of the interdependence between these aspects allows them to make informed and ethical decisions, considering the impact their actions have on their environment.

In summary, the generation of attitudinal strategies provides students with the opportunity to develop integral competencies and promote a balanced quality of life. By fostering a conscious and responsible attitude, they are prepared to face the challenges of today's world and contribute positively to their community and the environment in general.

References

- Álvarez, M. (2003). *Administración estratégica*, editorial Panorama.
- Barón, S., Cantillo, A., & Martínez, T. (2020). Desafíos de la responsabilidad social corporativa en las instituciones de educación superior. *Panorama Económico*, 28(2), 116-128. <https://doi.org/10.32997/pe-2020-2693>
- Data México, (2023). Huejotzingo. <https://datamexico.org/es/profile/geo/huejotzingo#population-and-housing>.
- Díaz-Barriga, F., & Hernández, G. (2010). *Estrategias docentes para un aprendizaje significativo*, Mc. Graw Hill.
- Dirección General de Universidades Tecnológicas y Politécnicas de México (2010). *Lineamientos de operación de los programas educativos por competencias profesionales*. Editado por SEP. <http://www.utsoe.edu.mx/normateca/LI>

NEAMIENTOS%20DE%20OPERACION%20CGUT.pdf

Estrella, M., & González, A. (2017). *Desarrollo sustentable*. Grupo Editorial Patria.

Gutiérrez, D. (2020). *Estrategias de enseñanza y aprendizaje*. Editor Universidad Pedagógica de Durango.

Hernández, S., Collado., & Baptista. (2018). *Metodología de la investigación*, Mc Graw Hill.

Partidas, G., Alvarado, G. & Ochoa, M. (2016). *Una metodología para discutir dilemas éticos*. Editado en *Educación superior y sociedad*. Publicado por el Instituto Internacional de Unesco para la Educación Superior en América Latina y el Caribe.

Pineda-Alfonso, J. A., (2017). *La competencia social y el cambio actitudinal en el aula*. Profesorado. *Revista de Currículum y Formación de Profesorado*, 21(2), 355-375.

SEP (1991). *Libro Azul: Universidad Tecnológica: una nueva opción educativa para la formación profesional a nivel superior*. Editado por la Secretaría de Educación Pública de México.

Silberman, M. (2006) *Aprendizaje activo*. Editorial Troquel.

Terigi, F. (2013). *Saberes docentes: Qué debe saber un docente y por qué*. Fundación Santillana

UNESCO. (2015). *Estrategia de Educación de la UNESCO 2014-2021*, editado por Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura.

UNESCO. (2020). *Análisis curricular Estudio Regional Comparativo y Explicativo*. Editado por Laboratorio Latinoamericano de Evaluación de la Calidad de la Educación