

Innovation Strategy: cognitive map future scenarios for sustainable development**Estrategia de innovación: Mapa cognitivo de hipótesis futuras para alcanzar el desarrollo sostenible**

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Received July 21, 2018; Accepted December 10, 2018

Abstract

The innovation is vital in our times, the education don't escapes to her. The innovative strategic learning for the "cognitive map of future hypothesis", created for REACH developed sustainable. It was thought for series of steps to Achieve active and constructivist role for the students, the TIC's let a significant mediation. The competence hypothesis Contributed to future gets to Thinking About sustainable, the student Such Strengthen to the profile of the and the graduation. Since the vision of the business administration, and make it was applied in students of esta career, to do This, it was Necessary used digital resources. One Resulted interesting, When question to their, if the strategic hypothesis of future Contributed to the knowledge over the sustainable develop, the answered, the 70% of the student be answered completely agreement, This was amazing. When one considers the above operation has-been successful, it was for the significant activates, the picture don't sustainable, the Conversation with the business man and the briefcase of briefcase

Innovation, Future Hypothesis, Sustainable developed**Resumen**

La innovación es vital en nuestros tiempos, la educación no escapa a ella. La estrategia innovadora para el aprendizaje "mapa cognitivo de hipótesis futuras" desarrollada para alcanzar el desarrollo sostenible, es una serie de pasos pensados para lograr un rol activo y constructivista para el estudiante, donde las tecnologías de la información permiten una mediación significativa. La competencia de hipótesis futuras contribuye a lograr un pensamiento sostenible, el cual fortalece al estudiante y al perfil de egreso. Desde la visión de la carrera de administración se planeó y aplicó en alumnos de ésta, haciendo uso de los recursos digitales. Uno de los resultados de mayor relevancia fue, cuando se les preguntó, si la estrategia de hipótesis futuras contribuyó a sus conocimientos sobre el desarrollo sostenible, el 70% de los estudiantes respondieron estar totalmente de acuerdo, esto es un dato revelador. Al reflexionar sobre los factores de éxito indudablemente fueron las actividades significativas, las imágenes de acciones no sostenibles, el diálogo con empresarios y el portafolio de evidencias

Innovación, Hipótesis Futuras, Desarrollo sostenible

Citation: MUÑOZ-ROSALES, Alberto Francisco, FLORES-HERNÁNDEZ, Adelaida, RUEDA-HERNÁNDEZ, José Fermín Enrique and FERNÁNDEZ-PÉREZ, Jorge Alejandro. Innovation Strategy: cognitive map future scenarios for sustainable development. Journal Schools of economic Thought and Methodology. 2018. 2-3: 9-18

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Introduction

Responsibility to our planet, whose wealth is the foundation same welfare and human progress. And above all, responsibility to the future to our children and their children. Kofi Annan

Innovation is the constant in the knowledge society, today more than ever before the various junctures is necessary to build solutions to the many complex problems that beset mankind. The first is to define the objective to be achieved, so, this research stands from higher education, to build an innovative educational strategy, with the central axis build the cognitive map of future scenarios in order to contribute to sustainable development.

The main objective of the research is to interpret the innovation strategy "cognitive map future scenarios" applied students of management career 2017-2019 generation of an institution of higher education. Competition imagination of future scenarios is proposed by UNESCO.

Its realization is justified because learning should be seen as the center of the educational process and the existence of imbalances in different contexts before it, is required joint attention of students, teachers, university, society, among others. Being the actors mentioned imbricated and the ability to make planned, systematic, compelling and relevant for sustainable development actions.

The main problem identified is the need to create educational environments that contribute to sustainable development, where different actions to enable active student activity. The hypothesis was Does the design of meaningful educational strategy depends on innovation and information technology to meet future competition hypothesis part of sustainable development?

The added value in this strategy is the use of the competence of future scenarios, the use of cognitive map of the same name, as well as the steps taken by the integral strategy, above, is considered the main contribution. The incorporation of information technologies are an element that contributes greatly and was a success factor.

This article consists of a brief theoretical framework on innovation, integrating technology into the curriculum, information technology and communication in education, virtual learning environments and sustainable development, as well as a description of the methodology. The main results are presented and, finally, conclusions are developed.

Theoretical framework

Innovación

Currently the teaching and learning strategies designed and implemented required to contribute to the sustainable development paradigm, therefore Ortega et al. (2007) consider innovation as a result of dissatisfaction in relation to a factor where interference has a personal or institutional level. In addition to the above, is part of a critique of the current situation, in our case a series of methodological steps to help build the competence of future scenarios, by being relevant to different contexts is necessary. In the classroom is planned in the short, medium and long term, but subsequent generations are not considered, nor their resources or capabilities. A conception of great value meets Lopez (2011), to understand innovation as the result of skills, having a twofold idea:

A deep mastery of skills requires the timely deployment of the capacity for creativity and diverse and multiple changes positive adaptation. Furthermore, the integration of skills in the process of teaching and learning in higher education is an important reform that aims to increase the quality of both teaching and management (p.287)

In this idea, the resources that must be present for students to solve different problems and simultaneously mobilize, raise standards of education, which is vital and its impact will be assessed in the graduate profile students.

The proposed strategy will take as its starting point the problem displayed by the student, from the perception of their neighborhood, region, city, state or nation, this will allow the construction of a meaningful solution.

Seeing innovation from the perspective of education Mogollon (2013) cited by UNESCO (2016b) understands how "is supported on learning, so this is linked to the action we take in the world" (p .43), the idea of the author is critical to our times, where necessary, for everyone to take an active role in reversing the problems identified in the social, environmental and economic dimensions, interdependent pillars of sustainable development.

On the other hand, a relevant precedent meets Pelgrum (1992) considered innovation, from "the positive side we found that the new information technology has already been implemented in many schools in developed countries. Despite the complexity of innovation, teachers and students enthusiastically embrace the new technology "(p.377), today, we can say that the trend continues and probably increases exponentially, which makes transcendental consider using different technological resources available to the student, such as databases, phone, computer, laptop, social networks and others to incorporate them into an innovative teaching strategy.

Integración of innovation in the proposed curriculum

Innovation as seen has different faces and ideas, one of which is the proposal by Diaz (1988) curriculum innovation focuses primarily on technical changes to the curriculum, so the strategy of future scenarios, aims incorporated transversely, ie, it can be employed in any subject of the curriculum, as a generic competition and because its very nature does not distinguish an area of knowledge in particular.

At the same time, in his analysis of the college, on trends and curricular innovations in higher education Diaz (1988), calls to join efforts to "confront a social economic, political and desestructura us; It is only in the collective review of the situation in which we review the educational crisis we face "(p. 7) If you are incorporating the environmental dimension, then proposed strategy is relevant to the premise handled by the author undoubtedly is necessary to contribute to imbalances generated.

Education is called to solve problems, by the fact of having in the classroom to future professionals who will make decisions and will affect the present and future generations in terms of resources and capacity, response,

Another important premise, put forward by Diaz (1988) is:

Faced with curriculum innovation (education and employment) need to build alternatives, we need to review the successes and failures of various popular social and national proposals that has passed the Mexican university. We need to build a university experience continue to respond to our Latin American condition. (P. 9)

The strategy devised in its final stages seek contact and dialogue with the business environment, being relevant this activity by several factors, the first, the construction of knowledge through dialogue with other actors in society, second, the student will have a approach to business, which will form a creative, abstract, thoughtful, complex and systemic thinking, because entrepreneurs have great experience, but the student must be able to convince, discuss and propose alternatives to reverse the problem, which is a wise move of curriculum innovation, by feedback, participatory development and respond to our Latin American situation.

Moreover, seeing the curricular experiences of other important institutions, educational innovation is vital and reinforce its core functions, as an example, is the National Polytechnic Institute (IPN) according to Ortega et al. (2007) applied the concept to improve their curricula, where the center was learning, on the other hand, teachers reconceptualized their mediating learning function, students to be immersed in innovation, formed in environments that allow them to deconstruct and build their knowledge to provide solutions to the problems of the region, elements in the proposal designed resume.

On the other hand, the application of innovation in higher education institutions can be seen as described in Mogollon (2013) cited by UNESCO (2016b):

When the term "project" is applied to desirable changes in education, these processes are generated from individual reflection or group of teachers. Thus there is improvement or innovation projects that arise due to the interest of a teacher to achieve more relevant and pertinent learning in students, mainly in its space management; These may be the result of reflection and action groups within an educational institution or teachers more extended groups. (P.14)

Thus, change is the central element in our case will be applied to the educational process, leaving behind forms centered on education or teaching. The main concern is to educate students with sustainable thinking making a relevant and meaningful learning. The strategy of future scenarios aspires to be an example of innovation, where the student acts as a builder of a proposal, progress and development activities require argumentation, research and advocacy of ideas. In no event will be a single answer, the fact of a dynamic reality, characteristic of the complex problems of our times.

Tecnología information and communication in education

Following this order of ideas, technologies of information and communication technologies (ICT) are truly significant, generate and contribute to creating solutions for our times, as stated "are not just mere repositories of information, but also structuring process and the activity of learning and cognitive process restructuradora person "(Cabrerero and Barroso, 2015, p.52), therefore, the proposed strategy is used in order to obtain favorable results in the student's education and contribute to build their own knowledge.

ICT really allow students to reach new stages of learning, incorporating new knowledge to your system, it generates a new imbalance that causes the need to reach a new equilibrium, if it is combined with a real and significant problem for the student as it is sustainable development then it is a new scenario, which the approach of Cabrerero and Barroso (2015) is significant, making the student community is involved in their own learning, tics allow it, with new ways of things done.

Thus it is also one of its functions, the important thing is to see it as an integration to other materials, a strategy or curriculum.

Following this line of work, another author who confirms the above is Area (2011) which is blunt in saying "ICT is, in this sense, one of the main stages of the socialization of a subject of the century" (p. 97), therefore, the strategy proposed in this investigation, will have to help ICT to foster dialogue with others in the group, and allow building solutions, from different points of view of others and student himself, giving way to building skills. More precisely, the author believes, if intelligence is sought is inevitable acquire solid knowledge before implementing this strategy is justified,

The idea of innovation takes a more forceful with the vision of Diaz-Barriga sense (2010), being part of the social reality in which society is, but having a component expiration that necessary reinvention, so create educational strategies that combine new elements to an end, with other stages and different objectives, one can say that there is innovation. Diaz-Barriga's (2010), the author makes a recommendation, to be a beacon in this sea of strategies and educational activities (p.42) "where a deep reflection on origins, livelihoods and practical implications are not conducive" there will be a reluctance on part of teachers, at this, the strategy will be explained to everyone involved in the educational process, in order to sensitize and listen to everyone's comments,

Ambientes virtual learning

The classroom in this approach is not commonly understood, is the space where combines human, social, educational, material, technological and digital resources in a constructivist framework, as expressed Peralta and Diaz Barriga (2010) "consists of a interactive system in which they occur a number of communication transactions. This system generates a particular environment conducive for building or learning work, determined by a set of rules of organization and participation "(p.1), this idea leads to create learning environments, which are to be achieved a solution for the knowledge society, to provide alternatives to activate and mobilize new skills in humans, having the role of student, worker or another.

To achieve mediation of students in virtual learning environments, you need to understand the new interactions where the teacher takes a secondary role, and, on the other hand, the student a major role, changing roles in the learning environment requires care certain elements, to which Peralta and Diaz Barriga (2010) express "three types of interaction: student-student, teacher-student and teacher-content. The focus of the educational process should be on the activities of teachers and students around the school contents and forms of interaction that adopt "(p.2), which, in this strategy of innovation, he designed in such a way that there is a clear process and the different actions among those involved in the educational process is privileged.

A vital issue is to create virtual learning environments where you need to consider new rules of the process, being relevant the virtual classroom, understood as that achieves objectives with different resources, where skills enabling new forms of action and the proposal are obtained new professional problems, being predominant consider the statement by Peralta and Diaz Barriga (2010) in relation to technological resources "its potential and limitations, all in order to create environments tailored to the virtual mode and truly facilitate the processes construction of knowledge "(p. 2), designed and implemented the strategy was careful promote new solutions to current problems with which the practitioner must take care management and be responsible. Technological resources used were designed based on what was within reach as they were databases, personal computer, phone, e-books, internet, personal camera and social networking.

The ideas presented above are complemented by Villar (2006) when considering educational institutions with new campus, where the process of teaching and learning will be a virtual space, it will lead to recreate and educate using new special resources. The strategy proposed organization uses information asynchronously, each student performs activities without losing its educational purpose, in order to mobilize the different resources that it counts.

Sustainable Development

On the other hand, a current paradigm is sustainable development, which translates into a call to all educational actors, where each part taking a leading role. Consequently, it is vital to know the Report of the Brundtland Commission in 1987 cited by UNESCO (2012) where sustainable concept is defined as "development that meets present needs without compromising the ability of future generations to meet their own needs" (p.8), ie, education will take an approach to what comes, your concern is, today and tomorrow, with a change of educational activities with great impact on the institution and in the classroom, therefore, propose a strategy to help build the competence of future scenarios is relevant.

Again, the idea of UNESCO (2014) is ratified with theorizing about education for sustainable development understood as "allow current generations to meet their needs, while future generations are given the opportunity to meet theirs , applying a balanced and integrated approach to economic, social and environmental dimensions "being here, which again requires actors in the educational process to be sensitive contexts considering three dimensions, which must be present in the profile egress of pupils, before this, it requires innovative strategies that activate the three dimensions in a balanced way. In our case the information technology will be incorporated to create a methodology and contribute to a situated learning.

This, leads to sustainable thinking, which must be activated and generated on students, future competition hypothesis was the center of the proposed strategy.

Methodology to develop

The research used the quantitative paradigm, being oriented to confirmatory verification of the fact that students would build a solution to a particular problem of sustainable development. With an interpretive approach, because there is an interaction of factors that made possible the realization of the overall strategy. Within the technique used was the questionnaire with closed questions.

The universe was composed of a group of 15 students studying management career, a sample of 10 students for the presentation of results was taken. an instrument with 25 questions that allowed interpreting certain indicators was used, validation was by a group of experts and a pilot was made.

Strategy portfolio of evidence continued, being a record and be a quantitative tool, your selection was due to allow the incorporation of all products made by students, as unpublished photos, ideas, proposals, and reports cognitive map. Generally we sought, first activate the knowledge, skills and attitudes of sustainable development and later build personal from cognitive map "future scenarios" to enable competition proposals. The creative contributions were well received, being an own material and based on constructivism.

To achieve its realization is necessary to incorporate a methodology that provides the student with a systemic, complex and sustainable thinking, therefore, intends to make the educational intervention in nine steps, which are listed below:

1. Lectura exploration of the current situation in virtual free access platform.
2. Descarga portfolio of evidence.
3. The student will analyze three videos on social, environmental and ecological dimension, as it will issue its views in the portfolio of digital evidence.
4. Realización reading sustainable development issued by the Organization of the United Nations Educational, Scientific and Cultural Organization.
5. Identificación unsustainable actions, three photos are created, being taken by the student or may be actuated to exemplify the imbalances. Relating to the social, environmental and economic dimensions, this activity will be done in teams.
6. Realizar the "cognitive map HF: future scenarios" in which their own ideas will be placed in the format designed for it.

7. Explicación their classmates and cognitive map presented as evidence a video of 1 minute.
8. Explicar an entrepreneur in the region cognitive map and submit a photo as evidence. If it is not possible an entrepreneur an adult, teacher or family person.
9. Evaluación of activities.

Results

After the intervention of the learning strategy of future scenarios, they were questioned students if they contributed to their knowledge on sustainable development, students answered 70% totally agree, 30% were found agree and 0% neither agree nor disagree, disagree, and strongly disagree.

In Figure 1 the data found are displayed. Hereby confirmed by Lopez (2011) when considering competition as one of the reforms that contributes to the quality, so it is worth asking the following three questions, being the pillars of competition and have a great impact on the innovative strategy

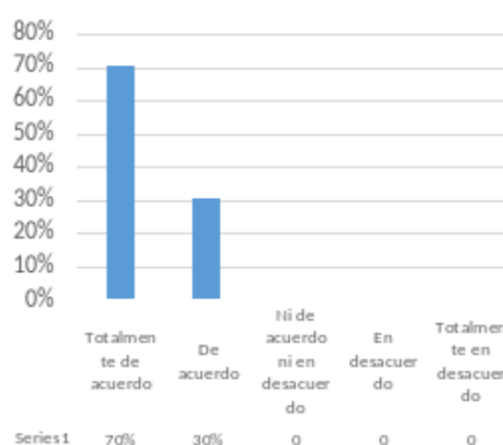


Figure 1 HF Strategy: personal knowledge contributes to sustainable development.

Source: Based on field data obtained in June 2018

They were interrogated pupils, if he helped his skills on sustainable development, to which the students responded 40% totally agree, 50% were found agree and 10% neither agree nor disagree, 0 % and 0% disagree strongly disagree. In Figure 2 the data are displayed.

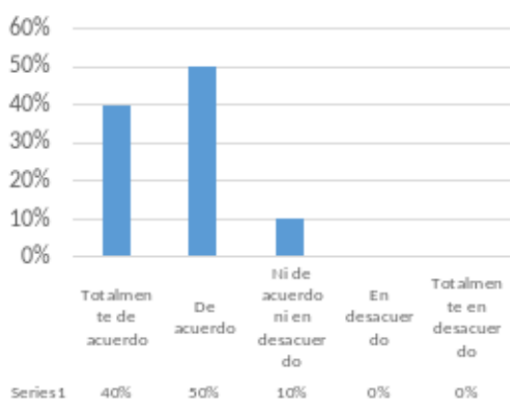


Figure 2 HF Strategy: helps personal skills on sustainable development.

Source: Based on field data obtained in June 2018

Another relevant question is whether he helped create values on sustainable development, to which the students responded 60% totally agree, 30% were found agree and 10% neither agree nor disagree, 0% disagree and 0% strongly disagree. In Figure 3 the data found are displayed.

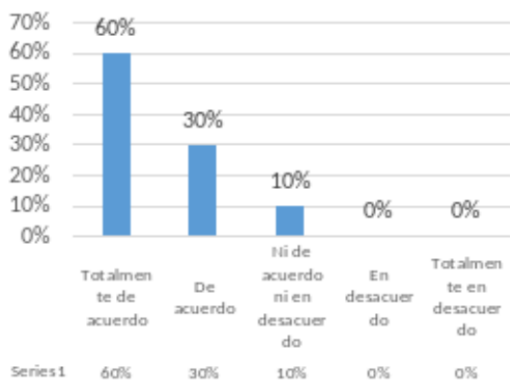


Figure 3 HF Strategy contributes to personal values on sustainable development

Source: Based on field data obtained in June 2018

When asked if the competition for future hypothesis is activated, the data found were interesting, the intervention group responded, 40% totally agree, 60% were found agree, 0% neither agree nor disagree, 0% in and 0% disagree strongly disagree.

In Figure 4, the data found yet conception Lopez (2011) notes, to understand innovation as a result of skills, in our case it manifests with a high percentage of acceptance among students are displayed.

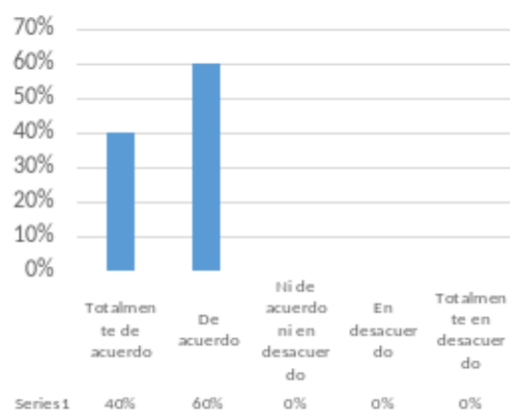


Figure 4 HF Strategy contributes to personal values on sustainable development

Source: Based on field data obtained in June 2018

The strategy of future scenarios, being designed simplicity sought, activities do not involve a great use of time, were asked in relation to this the intervention group, their responses were 50% totally agree, 40% were found to according, 10% or agree or disagree, 0% and 0% disagree strongly disagree. In Figure 5 the data found are displayed.

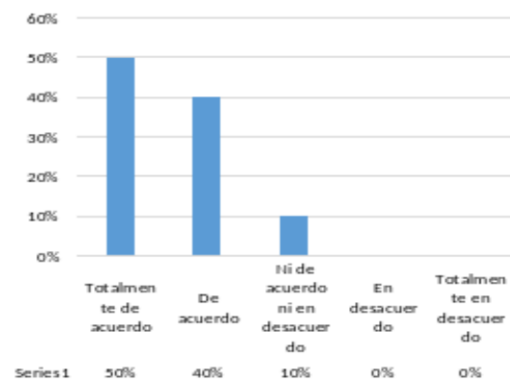


Figure 5 Simple activities in HF strategy

Source: Based on field data obtained in June 2018

A relevant question on the strategy of future scenarios is innovation to be designed sought to use this concept in their activities, they were questioned about it the group that was the subject of educational intervention, their responses were 40% totally agree with the subject, found 50% agree, 10% neither agree nor disagree, disagree 0% and 0% strongly disagree. In Figure 6, the data are found, before it, the idea expressed by Ortega et al. (2007) in relation to innovation is ratified and students confirm the existence of the concept in the strategy.

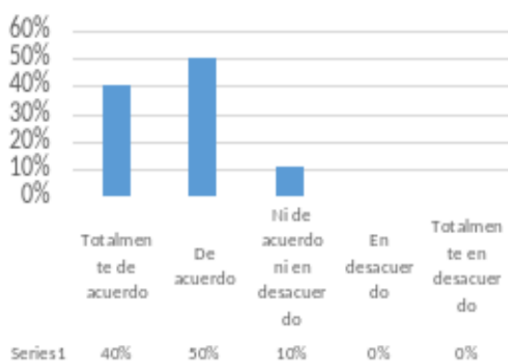


Figure 6 Existed innovation strategy HF
 Source: Based on field data obtained in June 2018

The strategy of future scenarios, being designed involving students sought therefore asked regarding their personal performance from their point of view, their answers were 30% totally agree with the subject, 70% they found themselves in agreement, 0% neither agree nor disagree, disagree 0% and 0% strongly disagree. The idea of Cabrero and Barroso (2015) is resumed and requires the student community to be involved in their own learning, tics enable this feature, why he was asked the question to the group and in Figure 7 the data found are displayed in relation to the strategy.

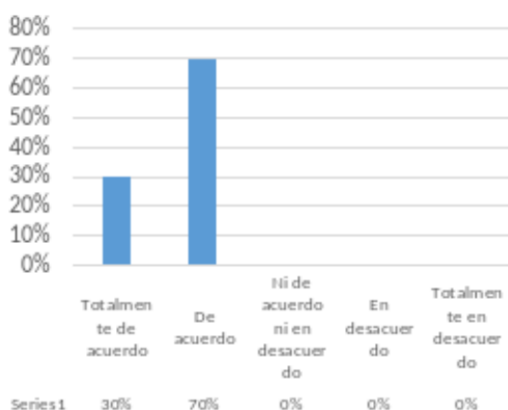


Figure 7 Be used prior knowledge HF
 Source: Based on field data obtained in June 2018

When asked if there was quality in the strategy of future scenarios, the data found were interesting, the group with educational intervention responded, 40% were found to be totally agree, 60% were found agree, 0% neither agree nor disagree, 0% and 0% disagree strongly disagree. In Figure 8 the data found are displayed.

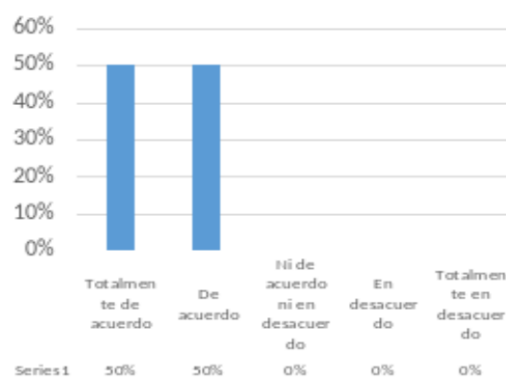


Figure 8 HF Strategy: Contribute to your education
 Source: Based on field data obtained in June 2018

Satisfaction about the didactic aspects is vital for any educational techno design, were questioned about instructional materials used in the strategy of future scenarios, the found results are, 50% were totally agree, 50% were found agree, 0% neither agree nor disagree, disagree 0% and 0% strongly disagree. In Figure 9 the data found are displayed.

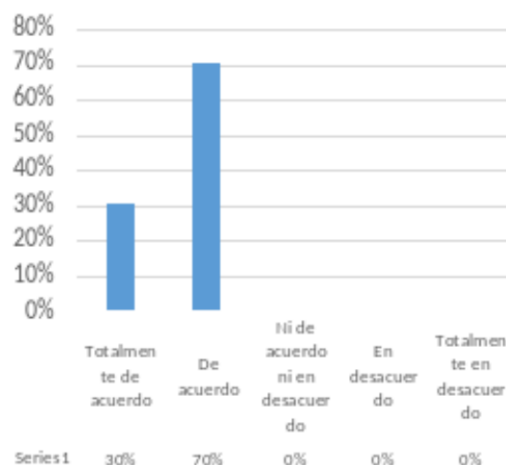


Figure 9 Proper communication generated in HF
 Source: Based on field data obtained in June 2018.

Conclusions

The research hypothesis is affirmative, incorporating ICT, innovation and virtual learning environments in a learning strategy allowed asynchronously meaningful learning. Moreover, the educational techno design was valued by experts in the field, which helped generate a strategy designed and built to meet the competition of future scenarios.

The interpretation made on the strategy was positive, since the student was able to propose a solution from the perspective of their environment and using meaningful and constructivist learning, by the fact that the solutions are based on the mobilization of their knowledge, skills, values and attitudes reached.

Innovation mobilized and activated when developing academic products where the student developed from their creativity and knowledge.

The planned project became a real strategy, and there are changes in palpable education, the first a portfolio of evidence, the use of sustainable thinking by the fact that students reflected on the problems of their environment, being significant in their environment while a cognitive map where solutions are viewed from their individual and business sentiment.

The tics were an element that contributed greatly to structure and make sense of a real problem of pupils and students, innovation was an excellent element in the educational strategy. By using the resources available to the student and those provided by the educational institution it contributed greatly to an active and constructive role by the student. Students being in a virtual learning environment were able to mobilize creativity and the different types of creative thinking, abstract, thoughtful, complex, systemic and sustainable by the fact that the strategy helped them mobilize to generate solutions and contribute to sustainable development.

Area the idea is true, the strategy allowed generate a socialization among students, teachers and businessmen in the region, with the focus on sustainable development.

There is certainly areas for improvement in the strategy, it is necessary to clearly define the time achieved in each activity and incorporate feedback from all stakeholders in the educational process digitally. Another needed improvement is the most intensive use databases, were used, but not required depth.

The virtual learning environment, allowed to structure the stages of the strategy, but also more clarity is required, by the fact that students tend to be easily distracted.

Cognitive map of future scenarios allowed structure and give a personal proposal, to be accompanied by dialogue and actions with the environment made possible the success of the strategy.

Techno teaching resources were acceptable, but it is an area of opportunity for the strategy, it is believed, by the great diversity of resources that are generated daily, students perceive it as well.

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