Didactic Proposal for the Development of Creativity and Innovation through the subject of Learning, Entrepreneurship, and thriving. (LET subject)

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ABSTRACT

This article is a derivative of the research project "Didactic Proposal for the Development of Creativity and Innovation, Under the Model by Competences, Making Use of Technologies as a Support Tool from the Subject Education to Learn, Undertake, Prosper (EAEP), in the Secondary Education of the Benjamín Zeledón School Located in District III in the Department of Managua, Nicaragua, Period 2022." Its objective is to create a didactic proposal by competencies for the development of creativity and innovation in the learner who belongs to the IV cycle of secondary education, from the subject of AEP.

We worked under a mixed philosophical approach, using qualitative (interview and checklist) and quantitative (survey) data collection techniques for a better understanding of the phenomenon under study, being the study descriptive and cross-sectional.

The results obtained allowed us to determine that it is necessary to stimulate skills in students such as teamwork, fluency of ideas, and lateral thinking. Currently, there are resources from the subject of AEP to develop creativity, however, in these contextualization and

pedagogical mediation are needed since what is addressed from these is more the conceptual part than learning by doing.

Finally, taking as a reference the aforementioned results, the didactic guide "My creative self" was designed, where the learner is the protagonist of his learning, this contains contextualized active strategies such as PBL, case studies, simulation, learning with ICT, techniques to activate creative processes among others.

1.   INTRODUCTION

Nicaragua is in a stage of promotion of creativity and innovation from the different sectors for the development of the country, a key actor of this promotion is the education sector, which seeks to develop creativity and innovation in students from the subject Education to Learn, Undertake, and Prosper (LUP), which was included in the educational curriculum, as part of the National Educational Program "Learn, Undertake, and Prosper".

Thus, this article is derived from the research project to qualify for the master's degree, for this, a diagnosis is made that allows to determine the competencies, didactic and technological resources that the school has in study to develop creativity and innovation, based on the results obtained, a didactic proposal is designed for the development of creativity and innovation from the LUP Subject.

The research strategy that was implemented is the following: the philosophical approach of the research is mixed, which allowed the collection and interpretation of the data for the development of the proposal, the type of research according to its purpose is descriptive, for its framework is field research, of transversal type and under the model R + D + I of the UNAN, Managua.

In this sense, the results obtained based on the objectives of the research are presented and the didactic proposal for the development of creativity and innovation of students belonging to the IV cycle of secondary education is described, in this way, it contributes to the fulfillment of the objective of the National Plan for the Fight against Poverty and for Human Development, which establishes to enhance human talent from the national education system.

2.   METHOD

2.1.   Type of Research

The research is descriptive since the phenomenon under study is analyzed and described promptly based on the variables and indicators of the research.

In the same way, it is a field study, this was developed in the facilities of the Benjamín Zeledón school, making five visits in total, on the fourth, eleven, twelve, sixteen and seventeenth of August of the year 2022, for this, the permission of the departmental delegate of Managua was sought to be able to access the school which allowed obtaining the required information through those involved.

2.2.   Population and sample

The study population consisted of an assistant principal, a national advisor, three teachers who teach the subject of LUP, and three hundred and eighty-four students who belong to the fourth cycle of secondary education (seventh, eighth, and ninth grade of the morning shift).

To obtain the sample of students, the finite sample formula was applied to the three hundred and eighty-four:

Figure 1

Finite sample formula

$$n = \frac{N\,Z^2\ pq}{d^2\,(N-1) + Z^2\ pq}$$

Note. Taken from the formula for calculation of the sample in health research by Aguilar- Barojas (2005)

Z = confidence level (95% corresponding with the table of Z=1.96)

p = Percentage of population that has the desired attribute (0.5)

q = Percentage of population that does not have the desired attribute (1-0.5 = 0.5)

N = Size of the universe (384)

d = Accepted estimation error (5%=0.05)

n = Sample size, the result **is 193**

Subsequently, the stratified sample formula was applied to the sample size (n) of students:

Figure 2

The formula for sample stratification

$$ksh = \frac{nh}{Nh}$$

Note. Taken from the book Research Methodology by Hernandez Sampieri et al. (2014)

Where nh and Nh are the sample and population of each stratum, and she is the standard deviation of each element in a given stratum. So we have to:

Figure 3

Sample stratification of the study population

$$Ksh= \frac{nh=}{Nh} \quad \frac{193=}{384} \quad 0.5$$

Source: Own authorship

So the total subpopulation is multiplied by this fraction of 0.5, to obtain the stratified sample

Table 1.

Results of the stratification of the sample under study

Degrees	Total, subpopulation	Sample
Seventh grade	138	70
Eighth grade	126	63
Ninth grade	120	60
	N= 384	n= 193

Source: Authorship.

2.3.   Data collection instruments

To collect the information, an interview was conducted with the deputy director of the center composed of sixteen structured questions, an interview with the national advisor with eleven questions, an interview with the LUP teachers containing twenty-one questions, an interview with the ICT teacher composed of seven questions, a survey aimed at students with sixteen items of single and multiple selections and a checklist that includes six criteria for review. bibliographic of the resources that currently exist to develop creativity and innovation.

3.   RESULTS

3.1.   Skills, teaching resources, and technological tools that the school has to develop creativity
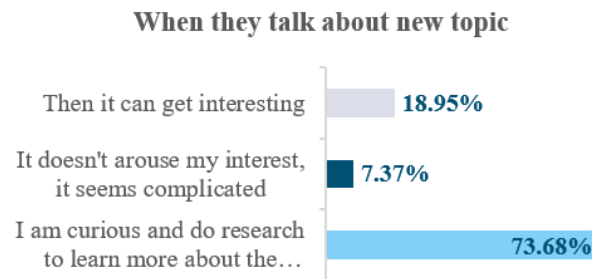
- **Teaching competences**

The teachers who teach the subject of LUP are specialists in Natural Sciences, Language and Literature, Mathematics, Social Sciences, and English, the ICT teacher is a specialist in Vocational Guidance and Technology. Regarding soft skills, the director mentioned that her teachers can communicate, work in teams, plan and organization.

- **Student competencies**

Contextualized questions were asked, referring to the creative skills that the student possesses:

Figure 4

Graphic: Creative Competence: Openness to Discovery (Curiosity)

When they talk about new topic

|	
Then it can get interesting	18.95%
It doesn't arouse my interest, it seems complicated	7.37%
I am curious and do research to learn more about the…	73.68%

Clos (2020) "Openness to discovery implies wanting to learn, to analyze the what and why of things in a given environment or domain." This means that students are in a good moment that should be taken advantage of from the application of various strategies to promote a research culture, according to the results obtained, students practice this type of activity.

Figure 5

Graphic: Creative competence: lateral thinking

Do you like to solve riddles?
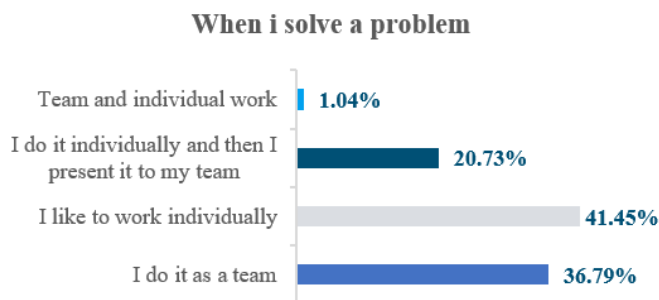
45.60% 50.78%

3.63%

■ Yes   ■ No   ■ Sometimes
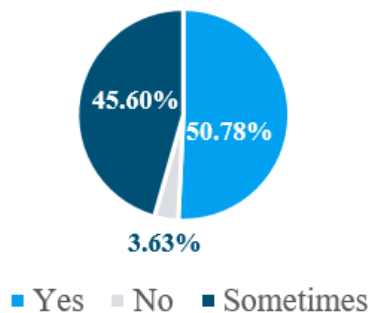
It was evidenced that it is necessary to stimulate the lateral thinking of students, for Collins (2020) lateral thinking tries to find imaginative, different solutions that depart from the classic "head-on" approach to any everyday problem. This is manifested in the so-called "riddles", where the solution, in general, is not precisely, the one that is most "expected".

This implies promoting spaces that allow the student to leave their comfort zone, from an aulic space implies designing strategies that help them find the way out of the various obstacles.

Figure 6

Graphic: Creative competence: collaborative work

When i solve a problem

Category	Percentage
Team and individual work	1.04%
I do it individually and then I present it to my team	20.73%
I like to work individually	41.45%
I do it as a team	36.79%

As part of this research, it was identified that the school requires co-creation spaces as a form of collaborative innovation, where collaborative work is encouraged to achieve common objectives, and, the interaction that can arise between students and society when proposing solutions to real problems, which will enhance knowledge, Students' skills and attitudes, leaving individualism aside. Creativity is not developed individually, but in environments where other actors are involved, other cultures that contribute to the development of novel ideas.

- **Didactic resources and technological tools**

The didactic resources available to develop creativity and innovation from the subject of LUP, according to the national advisor and bibliographic review exist curricular meshes, methodological guides, a compendium of strategies, and learning primers. However, the assistant principal and the teachers mention that the only thing they know and have access to is the curricula.

The school has an ICT classroom, equipped as follows: a) 82 tablets, of which only 50% are in good condition, b) Computers, but these are in poor condition c) A laptop and projector in good condition.

During the teaching-learning process, the technological tool they use is the cell phone, taking advantage of the resource to which the student has access.

3.2. Strategies that are used to develop creativity and innovation

The teachers who teach the subject LUP assert that the strategies they apply to develop creativity and innovation are: teamwork, commented that they were currently developing it as content, and that to make the class more striking and that the learner understands they develop dynamics taking it out of the classroom, also brainstorming and lived experiences. In addition, they implement the use of graphic organizers, and the development of recyclable projects, but they do not apply a methodology, since they claim that they are unaware of the Project-Based Learning methodological strategy.

SCIENTIFIC ARTICLES **Education**

4. DISCUSSION

The discussion of the results is carried out in a descriptive, explanatory way, based on the variables to respond to the objectives of the research.

4.1. Discussion of Objective N° 1. Determine the skills, teaching resources, and technological tools that the school has to develop creativity

One of the main tasks to be carried out is to strengthen Teacher Training in the subject of LUP, in the research carried out, it was found as a result, that those who teach the subject of LUP are not specialists in this area, but MINED organizes training for teachers of LUP.

However, the teachers who currently teach the subject claim that they have not received any training in issues of creativity, innovation, entrepreneurship, and active methodologies, the cause of this is that changes in LUP teachers are constantly made, since the greatest amount of workload of these teachers is in their specialty, and they complete their workload with LUP, therefore, they do not receive LUP training, but receive it in their specialty, said the deputy director. This is obtained as a result that many times teachers distort the work of the subject and focus it on business and crafts.

This in one way or another influences the development of creative skills of students, such as collaborative work, fluency of ideas, and imaginative problem-solving, among others.

Developing creative skills in the student demands great work and "requires a teacher who personalizes it and a fairer and more inclusive school to optimally develop people's capabilities". That is why it is necessary personalized teaching on topics of creativity and innovation, it requires an academic staff that joins forces to break the current schemes that have been formed to develop the subject of LUP. (Suarez et al., 2019, p. 116)

To this is added, that there ***are didactic*** resources in digital format to develop creativity and innovation, among these are: curricular meshes, PBL primers, a compendium of strategies, and methodological guides, the resources found are in function of the teacher, in these contextualization and pedagogical mediation is needed. In the curricula from the seventh to ninth (IV cycle), it was found that there are many repetitive contents where the complexity and autonomy for the learner are not increased according to the degree, in addition, the time allocated for some of them is little, such as the content of the entrepreneurial idea

In today's society an autonomous learner is required, the teacher should only be a learning guide, therefore, strategies, resources, and skills are needed depending on the student, so that, from the moment the student takes a resource and begins to read and interpret feel the commitment to assume his role as the main actor in a learning process.

Creativity is an aspect to enhance in today's classrooms because of its importance in the different abilities of students. It also meets the demand for an active learning style by the children of our schools, who look to us as teachers, the figure of a guide that leads them along the path of development as students and as people. (Cáceres Muñoz, 2012, p. 8)

4.2.   Discussion of Objective 2. Characterize the strategies that are used for the development of creativity and innovation

The strategies used in the LUP class are brainstorming, teamwork, exhibitions, raising topics and that students develop, we tell our own real-life experiences and relate them to the topics that are developed, in addition, we propose project ideas for students to develop mentioned by the teachers.

Figure 7

Strategies in which students participate in the AEP class
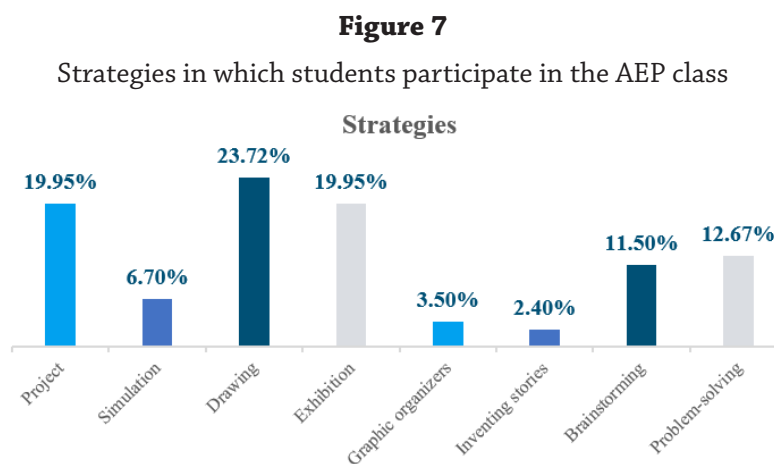
Product of the research it was important to emphasize that with this type of strategy, the learner is motivated to recreate his learning and not to provide given answers so that he from his learning context can find possible solutions to face the learning challenges of everyday life.

4.3.   Discussion of Objective 3. Didactic proposal to develop creativity and innovation

Taking into account the results obtained from objectives number one and two, a didactic proposal was designed, which reflects a comprehensive proposal of competencies, contents, strategies, activities, and evaluation. In addition, the age of the students was taken into account for the design:

Figure 8

Age of students
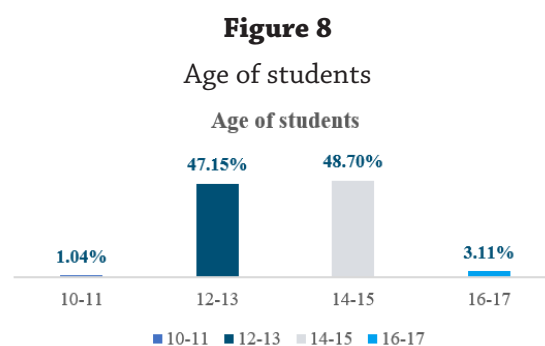
It is evident that the largest percentage of respondents is in an age range between 12 and 15 years, stage of adolescence, Piaget and Vygotsky mention (as quoted in) that, at this stage, cognition in the adolescent is called formal thinking, from the conception of Vygotsky to each new step in the development of thought contents will acquire new mechanisms of behavior, which would allow the passage to a higher stage of intellectual operations. So it is a good time in the student's stage to stimulate logical thinking for the development of creativity and innovation. Cano de Faroh (2007)

Based on the theory of the following authors:

Alaña -Castle considers that a medium is didactic when it is designed to instruct and facilitate those processes that occur within the framework of the classroom context with a teacher as a driver of teaching and a student in charge of making learning their own.

Barraza Macias (2005), in its article entitled Educational Innovation, defines areas of an educational innovation: a) the Introduction of new curricular areas or contents, b) the use of new curricular materials and technologies, c) the application of new approaches and strategies of the teaching and learning processes, d) The change of the beliefs and pedagogical budgets of the different educational actors.

In this sense, in the guide "My Creative Self", new curricular contents are proposed to develop creativity and innovation, the use of new didactic materials, the application of methodologies such as Design Thinking and active strategies, such as Project-Based Learning, Problem-Based Learning, the resolution of cases, among other contextualized strategies, the change of beliefs regarding the task and object of the subject, In addition, the teacher assuming a role as a guide and the student as the protagonist.

General Competence: Develops creativity and innovation using different resources and strategies, to face the challenges of a changing society, generating innovative proposals and initiatives.

Skills to develop

a)   Communication, (b) Problem solving, c) Fluency of ideas, c) Divergent or lateral thinking, d) Logical thinking, f) Collaborative work

Values

a)   Self-confidence, b) empathy, c) national identity, c) care for the environment

- **Seventh grade**

Integrative product: My creative idea

Competence: I enhance my creativity by knowing myself and getting involved in various real and contextualized scenarios that make me leave my comfort zone.

The following themes were established: a) My talents and characteristics as a leader, b) Vocational guidance, c) my experience creativity, and innovation, and d) My creative idea. The student begins by knowing himself and identifying his talents and skills, a series of scenarios are designed that allow him to know himself and awaken his leadership skills.

Subsequently, strategies such as learning with ICT, case studies, anagrams, techniques to break paradigms, and StoryBoard are applied to begin to be introduced in creative processes and finally, the active problem-based learning strategy is used with the aim that the student manages to design a creative idea proposal based on the identification of needs, problems or opportunities in your study center or community, taking into account your previously identified skills, here highlight techniques such as collaborative work, drawing, graphic organizers, brainstorming and report writing.

- **Eighth grade**

Integrative product: My entrepreneurial idea

Competence: I identify opportunities in the environment for the development of values and necessary skills, facing in a successful and self-organized way the constant changes that occur in today's society.

For the fulfillment of the competence and integration product, the following topics are proposed: a) My talents and entrepreneurial qualities, b) My entrepreneurial skills, c) My savings culture, and d) My entrepreneurial idea.

The student begins knowing entrepreneurial experiences at the national level to identify those talents and entrepreneurial characteristics that are required to take the initiative, in addition, to the strengthening of cognitive, and social skills and for the control of emotions. Subsequently, activities are developed to promote a culture of saving where it is proposed that the student apply a survey in their community to know how the culture of saving is developing and identify resources to make new creations from recycled material.

All of the above provides inputs for the student to propose entrepreneurial ideas apply their skills and put into practice the culture of saving. The active strategy that guides this topic is Project-Based Learning, step by step, it is proposed that techniques such as SCAMPER, ICT learning, schedule, prototype designs, and reporting, and finally, this is presented at a fair, for the student to communicate their proposals.

- **Ninth grade**

Integrative product: My innovative idea

Competence: Development of design thinking for the realization of innovative proposals that benefit the school, community, and family

In this degree, only the development of two major themes is proposed: a) My first innovative ideas and b) My innovative project. In the first topic, Design Thinking is applied as a guiding methodology, a methodology to generate innovation, giving solutions to real problems, and reflecting them through design thinking. It is proposed that the student resume the entrepreneurial proposal that he designed in the previous degree, with the aim of monitoring and applying innovation processes.

In the second topic it is proposed that they determine the viability of their project, apply business models, define a brand, and present their project at a fair applying the PITCH strategy, which consists of communicating the most essential of their proposal in a time limit not exceeding three minutes.

5. CONCLUSIONS

As part of the research process, the following conclusions have been reached: the teachers who teach the subject of LUP, are not specialists in this area and have not been participants in training on issues of creativity, innovation, and entrepreneurship. This phenomenon occurs due to the teacher rotation they do from the school administration since the greatest workload of teachers is in their specialty and the hours left to complete are assigned to LUP.

This factor influences both the development of students' competencies, as well as the fulfillment of the task and purpose of the subject since they associate LUP with crafts and business.

A series of didactic resources are identified such as curricular meshes, methodological guides, PBL booklet, and compendium of strategies, these are in function of the teacher, and contain generic strategies, contextualization, and pedagogical mediation are needed. In addition, although the school has an ICT classroom, the most used technological tool is the student's cell phone, as a means of supporting learning.

Teachers and students state that the strategies they use to develop creativity are: brainstorming, exposure, use of graphic organizers, diagrams, drawings, and projects. There is a certain ignorance of the existing methodologies to develop projects, which often causes the project ideas to be proposed by the teacher, preventing the student from being the protagonist of their learning.

Taking as a reference that there is an educational need, a didactic proposal was designed to develop creativity and innovation, where it is proposed that the student is the protagonist of his learning, solving activities contextualized to his environment, through various methodologies and active strategies, allowing him to develop in environments that encourage creativity and innovation.

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