

Learning Communities in the Development of Competencies for the Teaching of Natural Sciences

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Abstract: This research paper aims to guide the teaching of science, applying innovative strategies so that the normalist student has an interest in caring for the environment and nature, developing teaching skills for teaching this subject at the basic level of education.

Key words: natural sciences, environmental care, teaching skills

1. Introduction

In this research work it is intended that both teachers and students of the second semester of the Bachelor of Primary Education of the school, Profra. Amina Madera Lauterio, first of all, know in detail the work methodology called learning communities, so the first section of this research will be dedicated to knowing the background of this issue from a theoretical perspective.

The background section of this work will contain different investigations related to the subject of learning communities and the development of teaching competencies, including in this documentary exploration, international, national and state investigations, to give a clear overview of the findings and procedures that have already been proposed with regard to learning communities and the development of teaching competencies.

Once the necessary reference platform has been established, an exhaustive analysis of the approaches, positions and conclusions of each author will be made to establish the state of the art with reference to the subject of study, proposing in this section the study possibilities that remain open to be explored.

In the next section of this document, the definition of the object of study will be made, where in the words of Hernández (2001), “The object of study is what we want to know about a topic or situation, also called a phenomenon of interest. It arises from some concern or problem, be it my own or someone else’s” (p. 58), which is why this research is very closely linked to the teaching work that I perform in my institution, in which I attend the course of “The care of the environment and nature”, in the second semester of the degree in primary education, which is why my interest in this subject has arisen.

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2. Methodology

The problem in the regional center for normal education Profra. Amina Madera Lauterio, where despite the daily efforts of the students and teachers of the school, the reality is that when doing studies and analysis on the consolidation of the characteristics of the graduation profile, the results are a bit discouraging, since We find 7th semester students who still have many difficulties to write, with very serious weaknesses in the planning process, with conceptual and theoretical absences that make us reflect on the true training that is being provided and the professional commitment that these students are putting on your career.

The problem will be immersed from the perspective of the course called study of the environment and nature, under the premise that the “good judge begins at home”, which is why the competences where the students of the school are established below According to the diagnosis described in previous chapters, the students are having weaknesses in the consolidation of some specific competences from the perspective of the natural sciences subject that frames the 2018 curriculum of normals and are the following:

- Lack of mastery of basic content for the teaching of science and its scientific notions.
- They fail to construct scientific explanations of natural phenomena or argue written with solid academic rigor.
- Does not design didactic situations where a natural congruence is perceived between the focus of the subject and the proposed activities.
- Does not diversify activities in such a way as to rescue the students' center of interest.
- Does not evaluate with relevance and constancy to keep systematic records that guarantee the evolution and progress of the students.
- Does not seem to have developed notions of ecological awareness, care and preservation of species or self-sustaining projects, where it is involved in a constant or active way.

These weaknesses in the training of teaching competencies that are reflected in the CREN are not particular situations of this school, since apparently they are common situations in teacher training schools, which has aroused the interest of researchers such as Torres (2015) who externalizes that future teachers will have responsibilities inherent to their professional training and therefore will be in charge of the education of boys and girls who have the right to learn in all subjects.

Recently, the subject of natural sciences has positioned itself as a subject of fundamental interest, in these times of crisis, scarcity and macro-environmental problems, which are little by little leading the human being to self-annihilation.

Another point of view to consider is that raised by Orrubia (2014), who concludes that learning communities are contexts in which students learn thanks to their participation and involvement, in collaboration with other students, with the teacher and with other adults, in genuine processes of research and collective construction of knowledge on personal and socially relevant issues, where according to his writing the essential thing is that these processes refer to authentic and relevant situations, activities and tasks for the participants.

Some other investigations present viable alternatives to start working on strategies to eradicate these problems, such as the contributions of Galán (2015), who addresses the subject of the tutored library within the learning community of Martín el Chico, where the conclusions They point to the creation of voluntary groups by centers of interest, setting the guidelines for teachers and students to approach the learning communities voluntarily, since only in this way affirms the author will the commitment be authentic.

In sum, work in learning communities for the formation of competencies requires effective alternatives that awaken in the student their desire to learn, so the subject of study is raised as follows: How to develop teaching competencies in the students of the second semester of the course study of the environment and nature, through the methodology of learning communities in the 2019-2020 school year.?

This fact leads us to consider alternative solutions based on the National Development Plan framed for the current six-year term where the prospective vision of the country is proposed, it establishes in one of its goals that in Mexico a quality education must be guaranteed to ensure a comprehensive development of all Mexicans and thus have a prepared human capital, which is a source of innovation and leads all students to their highest potential.

This goal seeks to increase the quality of education so that the population has the tools and writes their own success story. The approach, in this sense, will be to promote policies that close the gap between what is taught in schools and the skills that today's world demands to develop for lifelong learning, so it will be crucial that both teachers As educational authorities, they review in depth the guidelines, established for each grade, to be able to decide the best teaching methodologies that are appropriate for their class groups, with the sole intention of improving the teaching processes for the learning of their students.

Normal education is part of this transformation process and plays a transcendental role in the training of future teachers, who will have this mobilization of knowledge in their hands, so it is of vital importance that from their training students acquire different knowledge theoretical and practical of the different teaching methodologies in which they can be supported to successfully carry out their educational practice,

Flecha (2008), who raises the following premises, "work in learning communities is the teaching-learning methodology that provides the best results for both teachers and students, since it allows the empowerment and metacognition of students in development of school activities, consolidating skills for real life.

The challenges and challenges that it leaves framed for the interpretation of each teacher and reader of this work, is that each school must decide when, how much and how to change, thus respecting the rhythms and styles of each teacher and how much each teacher wants to commit, but Once the opportunity to live the experience is given, he will surely repeat it the following year, Gaona (2008), points out in his results that the resistance will not take long to be demonstrated, since any change in the beginning generates instability, but if this it is sustained and effective, sooner or later efforts yield good results.

When exploring a little about the background of the concept of learning communities, we can find that this methodology is not totally contemporary, but until recently the concept has begun to be incorporated in many educational institutions as an alternative for teaching where it can be To combine many of the most effective theories of constructivist and sociocultural learning, that is, in the words of Vigotsky (1979), learning takes place in sociocultural environments when different teaching strategies are combined in a good way.

The first learning community emerged in 1978 with the La Verneda Sant Martí adult education center, which is located in a working-class neighborhood of Barcelona. This program takes as its principle the African proverb "it takes a whole town to educate a single child". The idea is that everyone who is part of the school (families, teachers, students and other professional and non-professional education personnel) must be involved in the education of the boys and girls of the center.

The great difference found between the traditional classroom and a classroom incorporated into the methodology of learning communities is that unlike in traditional classrooms, inherited from industrial society, in this educational model of learning communities, there is not only one teacher that explains certain academic

content.

In the learning communities, we find several adults, including volunteers committed to education, who support the learning process, bringing different profiles and diversity to the classrooms. These volunteers, among others, can be family members, former students or participants from neighborhood or city associations.

By finding this alternative as a research group, we want to test whether with this methodology of learning communities the teaching skills to teach natural sciences can be developed.

But, what is a competence? The term can generate different points of view, among which is that of Attewell (2019), Competence is the ability to do something, but the word competence also connotes a dimension of increasing ability, of In this way, while competence is synonymous with skill, it also evokes images of mastery, expertise, mastery, ability and excellence, this position reveals that for a student to be able to say competent it means that he is immersed in a synergistic process where at the same time It has skill but that skill is constantly perfected the more it is used.

In the words of Díaz (2006), A characteristic of the development of competences is that it can never be affirmed that “they have or do not have them”, but rather that they are part of a process, since their development can always be better. which leads us to rethink the position that the development of competencies has an ascending cyclical spiral, which will take the student to different levels of mastery, which will depend on each student and their constant appropriation.

Perrenaud (2006), emphasizes that one of the most important contributions of the competencies perspective is to promote the mobilization of information in the learning process, that is, that competence can only be given when the foundations are laid in an adequate explanation and this information is passed to the field of facts, that is, to the application of knowledge and the verification of results in an experiential way, where perhaps several attempts of trial and error will be necessary.

In this step, it is necessary for the student to have the necessary disposition and sufficient interest so that the results become evident, reaffirming the exposed theory that the development of competence is gradual and progressive but not independent, that is, they require various knowledge and skills together.

The “learning communities” which is a very spatial methodology because of how flexible and dynamic it results, since the different strategies and techniques mentioned above can converge in it, it is only a matter of the teacher and the students agreeing on the way of approaching the contents so that the entire learning community turns based on the making of agreements and the development of the competences to be developed.

The learning communities can become a whole great project based on a set of Educational Success Actions, aimed at the social and educational transformation of the community. Work in learning communities can begin at school, but its objective is to jointly integrate all the social actors that are around it.

What learning communities seek is to achieve a successful education for all children, combining knowledge and continuous improvement in school learning for all students, at all levels through better coexistence and supportive attitudes for knowledge set and global of the participants.

The European community is the one who began the work with this alternative to approach learning in a different way and it is they who have identified certain patterns of behavior that schools experience once they decide to enter into this methodology of community work, to which called stages of transformation, which we will detail below: Awareness, Decision-making, Dreams, Priorities and Planning.

a) Sensitization

It all starts with the scientific training of the entire community involved in the educational process — a

preparation that must happen intensively.

At this stage it is time to carry out a deep reflection on those educational actions that give the best results. It is also the moment to do an analysis on the current conditions of the school; to identify strengths and weaknesses to determine what actions are necessary for social inclusion and academic success.

b) Decision making

It is the stage in which the final decision is made: the school is going to transform itself into a Learning Community. A decision that requires consensus through constant dialogue with the entire community involved and everyone's commitment.

c) Dreams

The time has come when the entire educational community (students, teachers, family members, management team, social agents) dreams of the school they want for the future.

d) Priorities

It is when they decide which are the most urgent priorities, the most relevant dreams shared by the entire community.

e) Planning

Time to design Successful Educational Actions.

In the Learning Communities, it is based on the premise that all participants can commit their actions with the firm objective of obtaining better results; learning through experimentation, review and analysis of their professional work. It assumes that teachers participate in work teams, putting collaborative learning into practice, where from the interaction, the teacher strengthens their professional skills, for the achievement of a common purpose.

For the creation of a Learning Community, it is important to take into account the following aspects (Barrio, 2005):

- Equality of differences.
- All participants build and reconstruct their learning.
- Dialogic learning.
- Acceleration of learning.
- Collaboration and participation.
- Empowerment.
- Cultural intelligence.

3. Learning Community Intervention Strategies

The objective of the intervention in this research is to develop teaching skills for the teaching of natural sciences in the students of the Study of the environment and nature course of the second semester of the Bachelor of Primary Education in the 2019-2020 school year.

First, with the development of this intervention, it is sought to diagnose the competencies for the teaching of science that the students of the second semester of the Bachelor's Degree in Primary Education have developed, to favor their development at work in learning communities.

With the design of this action plan, it is intended to integrate a methodological proposal that involves working with learning communities for the development of competencies for teaching science in the 2018 study

plan of the Bachelor of Primary Education, where the design of intervention strategies for this action research, will respond to the model proposed by the Academic Orientations of the degree work of the Normal School (2018), which are: intention, action, observation and evaluation and a general conclusion by strategy.

- The intention in this section will make explicit the objective pursued in each of the activities undertaken as a learning community.
- Planning where the didactic situation to be developed will be made explicit, which will consider the diagnosis made at all times.
- The Action, this section includes the set of strategies, procedures, proposals and designs whose primary purpose is to influence the improvement of practice and consequently in the improvement of their teaching skills.

The data and evidence collected, through a relevant technical procedure, will facilitate the analysis and evaluation of each of the actions undertaken.

• Observation and Evaluation, in the penultimate section of the action plan, it is implied the use of different methodological and technical resources that allow evaluating each of the actions carried out and/or evidence obtained, in order to submit them to analysis and reflection exercises leading to its rethinking.

It is important to emphasize that it is necessary to use instruments such as the field diary, evaluation rubrics and checklists, to verify the fulfillment of the proposed objectives.

• The Conclusion is the process that closes, it allows the rethinking of the problem, in this section a global retrospective look is involved where the efforts can be evaluated and the results compared in a self-reflective spiral of knowledge, skills and competencies developed.

Synthetic Table of Learning Community Strategies

No.	Estrategia	Objetivo general	Actividades	Producto final
1	Strategy 1.	Assemble a diversified team of students to plan the course together	1. Formation of the planning team	Diversified planning team
	Diversified and flexible planning		2. Didactic Planning Meetings	Course project
	Two weeks of work with five total meetings		3. Formation of Guide and work anthology	Course materials (guide and anthology of course work)
2	Strategy 2.	Develop teaching skills in students to teach natural sciences in learning communities	1. Scientific experiments	Jet-propelled rockets
	Interactive and operational learning groups		2. Study trip	Trip to Morelia Michoacán
	Fourteen weeks of management and application		3. School projects.	School area rescued by applied environmental project
3	Strategy 3.	Formation of learning communities, between teaching students and experts invited to participate.	1. Special guests day	Face-to-face or virtual interactive panel carried out by each learning community.
	Support group among experts		2. Team exams	Exam conducted as a team based on strengths and abilities of community members
	Four weeks of management and application			
Totals		20 weeks of application	8 core activities	8 evidences of final work

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