

El método de aprendizaje por proyecto: una experiencia desde las didácticas particulares

The learning method by project: an experience from the particular didactics

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Recibido: 15/04/2020

Aceptado: 10/09/2020

Resumen: El método de aprendizaje por proyecto posibilita que el profesor se convierta en un proveedor de recursos y un participante de las actividades de aprendizaje, es visto más como un especialista, asesor o colega. ¿Cómo utilizar el método de aprendizaje por proyecto en las didácticas particulares? La experiencia desde la asignatura Didáctica de las Ciencias de la Naturaleza en 4to año de la carrera Licenciatura en Educación Especial propone pasos metodológicos que posibilitan adecuarlo a un nuevo contexto. La aplicación demostró ser una alternativa viable para demostrar la autogestión del conocimiento de los estudiantes desde una nueva arista.

Palabras clave: Aprendizaje; Proyecto; Didáctica; Ciencias de la naturaleza

Abstract: The project learning method enables the teacher to become a provider of resources and a participant in learning activities, he is seen more as a specialist, advisor or colleague. How to use the project learning method in particular didactics? The experience from the Didactics of Natural Sciences in the 4th year of the Bachelor's degree in Special Education proposes methodological steps that make it possible to adapt it to a new context. The application proved to be a viable alternative to demonstrate the self-management of students' knowledge from a new edge.

Keywords: Learning; Draft; Didactics; Natural Sciences.

Introduction

Training an education professional is a complex task and represents an enormous challenge, based on the accelerated scientific and technological development of changing social needs; projecting the reflection and continuous improvement of educational practices and their consequent updating, are essential tasks that correspond not only to the training institutions, but to the entire pedagogical community in general, (MES, 2016).

Attention to diversity in the present moment, demands a pedagogical expression that guarantees equality of opportunities, equity and a professional education that facilitates a

preparation to face and promote initiatives before the contradictions that arise in the educational context. Special Education in Cuba is recognized as a network of centers, services, care modalities, professional resources and extension channels, made available to children, adolescents, young people and adults with special educational needs associated or not with disabilities.

The Special Education educator must be a professional who demonstrates, on a daily basis, a solid preparation in political, psychological, pedagogical and didactic matters, with a mastery of content, capable of flexible and innovative educational work that can provide an effective response to the educational and learning needs of his or her students, from a transdisciplinary perspective (MES, 2016).

The economic and social development of our country calls for universities to work on projects. It refers (MCTMA, 2014, p. 2), that the project constitutes the basic cell for the organization, execution, financing and control of the activities and tasks of scientific research, technological development and innovation, aimed at materializing concrete objectives, obtaining results of impact and contributing to the solution of the problems that determined its implementation. The careers should prepare the student with this vision from the curriculum. Encourage them to develop a variety of social skills related to group work, seeking information to solve problems, as well as build their own knowledge by promoting the retention and transfer of it from the transdisciplinary.

In the 4th year of the Special Education degree, Course by EC Meeting, the following subjects are taught: Didactics of the Natural Sciences, Didactics of the Social Sciences (particular didactics), Speech Therapy II and III, Psychology IV.

For the teaching of its content we use the project learning method, taking into account that the current times require the self-management of knowledge, where the adjustment of the pedagogical response in the training of future teachers is a generalized, flexible, creative and transforming practice of the teaching-learning process, in correspondence with the peculiarities of the development of each student with special educational needs, associated or not to the disability.

The project work method emerges from a vision of education in which students take greater responsibility for their own learning and where they apply, in real projects, the skills and knowledge acquired in class. The project learning method seeks to confront students with situations that lead them to rescue, understand and apply what they learn as a tool to solve problems or propose improvements in the educational entities where they work.

According to the Model of the Professional of the Degree in Special Education, the particular didactics constitute one of the essential pillars of the formation of the teachers of the specialty for its content and need to retake general concepts of Pedagogy, Didactics, Psychology and other sciences.

In the analysis we realized that the professional skills are directed to:

Among the professional pedagogical skills of communication of the contents.

- Participate in team work, in the dynamics of your group in a climate.
- Exchange ideas, send, receive, elaborate and emit information, opinions and attitudes, in order to build new knowledge.

Other professional teaching skills, aimed at the scientific substantiation of the solution to professional problems.

- Manage information by working with different sources of knowledge.
- Use integrative seminars, including workshops, where the understanding of the essence of the discipline's foundations is evident

The contents of the Didactics of the Natural Sciences as a common core program were taken as a basis, a program corresponding to the particular didactics. The other subjects (Didactics of Social Sciences, Psychology IV and Speech Therapy II) were worked on in a transversal way from their systems of knowledge, skills and values.

Source: Self-elaboration

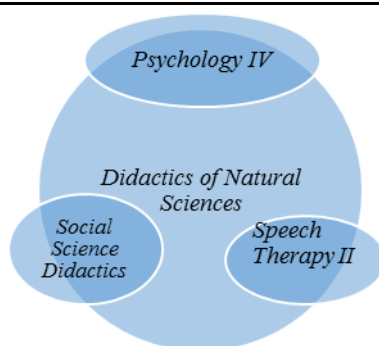


Figure 1. Interrelation of the subjects.

The present work has as objective: To elaborate methodological steps to work the method by project from the Didactics of Natural Sciences subject in the Special Education career.

Development

The project learning method, being a "transdisciplinary" strategy (Hernández, 1998), is related to a wide range of teaching-learning techniques, such as case studies, discussion, problem-based learning, etc. Transdisciplinarity means breaking with the unilateralism of the disciplines and establishing a dialogue among them, thus extending their research horizons and their understanding of the dynamics of the social.

When the project learning method is used as a strategy, students stimulate their strongest skills and develop some new ones. They are motivated by a love of learning, a sense of responsibility and effort, and an understanding of the important role they play in their communities.

The project learning method creates a highly conducive environment for the acquisition and development of knowledge, skills and attitudes in students, enabling the search for solutions to non-trivial problems:

Asking and improving questions

- Discussing ideas
- Making predictions
- Designing plans and/or experiments

- Collect and analyze data
- Drawing conclusions
- Communicate your ideas and discoveries to others.
- Creating artifacts, (teaching aids) (Blumenfeld et al., 1991).

Working with projects can change teacher-student relationships. Projects can change the focus of learning from simply memorizing facts to exploring ideas.

The project learning method approaches the fundamental concepts and principles of the discipline of knowledge and not topics selected based on student interest or the ease with which activities or results would be translated.

Some teacher presentations and student-led work may be involved in this strategy; however, these activities are not ends in themselves, but are generated and completed in order to achieve some objective or to solve some problem. The context in which the students work is, as far as possible, a simulation of real-life investigations, often with real difficulties to be faced and with real feedback, (Díaz, E. and Suñén, M., 2013).

The case in question benefits the teaching and learning process in the units where the students work or carry out their research work practice, as part of a program that complements their training as future professionals.

Proposal of methodological steps to work the method by project in class:

Project approach

In the planning of the project, some elements should be taken into account such as the duration of the project (one week, one month, one semester), complexity (one topic, several topics), scope (the classroom, teaching unit), technology (limited) and support (one teacher, several teachers, specialists, directors of the teaching unit).

Example.

Duration: 1 month

Complexity: subject II of the course

Scope: selected teaching unit

Technology: computer, tablet, phone

Support: teachers of the year, teaching unit tutor, specialists, managers

2. Planning, setting goals and objectives to be achieved

A subject is chosen that is related to the content of the subject, in a way that motivates learning and allows the development of cognitive and educational objectives, where the other subjects that appear in the curriculum are also related and allow their linkage.

A guiding question (problem to be solved) is formulated to help detect their previous knowledge on the subject and to invite them to think about what they should investigate or what strategies they should implement to solve the issue. Work teams are formed.

Example:

General objective: To elaborate a class of the subject The world in which we live of 3rd grade for students with slight intellectual disability where the integration of the contents of the subjects Didactics of the Natural Sciences, Speech Therapy II and Psychology IV is evident.

Specific Objectives

1. Instrument the creation of working groups for the study, planning, orientation, evaluation of class plans according to the didactic preparation of the future professional of the Special Education career.
2. To diagnose the main regularities in the development of the teaching-learning process of the subject The world we live in, in order to define the main potentialities and didactic needs to be taken into account according to good classes.
3. To use audiovisual means in order to increase the quality of the project and the development of professional skills.
4. Plan the class of the subject The world we live in with a multidisciplinary vision that involves the future graduate in Special Education with a didactic preparation in

correspondence with the demands of the professional model and the characteristics of the students with some type of disability taking into account the speech therapy problems according to diagnosis.

Guiding question: How to integrate the contents of the subjects Didactics of the Natural Sciences, Speech Therapy II and Psychology IV in a 3rd grade class of The World We Live in for students with mild intellectual disabilities?

3. Orientation

The teacher organizes teams or groups of three or four students, so that there is a diversity of profiles and each one plays a role. He/she communicates the product to be developed according to the skills to be developed. The cognitive and educational objectives are defined, taking into account the model of the professional and the subject, as well as the criteria that will be evaluated at the end of the project.

Example:

6 groups of 3 students each are formed. In the experience we did it by teaching units, popular council, municipalities, to facilitate the realization of the project, due to the heterogeneity of the group. The leader or head of the group is selected, taking into account the academic and leadership characteristics he or she possesses, to guarantee that the tasks are completed with the highest quality and promptness.

They are asked to submit a schedule or work plan specifying the tasks planned, activities to be developed, those in charge of each, identify the resources to be used and the schedule for carrying them out.

Example:

Task	Activities	Responsible	Resources	Time
1. Determination of activities and tasks	Elaborate the activities and tasks to be developed in the	Professor and student	Computer, phone	2 days

	project			
2. Distribution of task responsibilities to team members	Create (6) teams with (3) students Instrument the creation of work groups. -Distribute the roles of each task to the students	Professor and Students	Computer, phone	1 day
3. Search for basic didactic concepts	- Consultation and review of bibliographies researched fundamental concepts, taking into account students' learning styles.	Students	Books, computer, tablet, phone, internet	4 days
4. Elaboration of guides	- Meeting of the group to determine the guidelines to apply in the research, the degree and the disability with which they will work. - Assign students the responsibilities and application of the	Students, tutors	Computer, teaching materials, books	5 days

	guidelines. -Elaboration of guides, apply to verify the problems to be investigated.			
4. Application of guides	- Establish coordination with the teaching unit to apply research instruments. -Application of research instruments.	Students	Guías	7 days
5. Compilation and analysis of results.	- Team meeting to analyze the results of the instruments. Determination of regularities.	Students, teacher	Computadora, tablet o teléfono	5 days
6. Elaboration of the project or product (the class)	- Study of normative documents (clinical and cumulative student files, programs, methodological orientations, textbooks, educational software).	Students	Programa, orientaciones metodológicas, libros de texto, cuaderno de actividades, materiales didácticos, software educativos, computadora, tablet, teléfono	5 days

	-Collection of information Class planning.			
7. Product (project) presentation and evaluation	Exposure of the project results. -Use of participatory techniques. -Student evaluation	Students and teacher	Computer, tablet or phone	1 day

Table 1. Chronogram. Source: self- elaboration

4. Development of instruments for research (observation guide), interview, document review or others).

In this step, a group meeting is held to determine the guidelines to be applied in the research. In order to determine potentialities and weaknesses in the process of teaching and learning the subject *The world we live in*, classes must be observed, interviews with teachers of the grade, cycle heads, director and specialists must be carried out.

Students are assigned responsibilities and roles in the group related to the development and application of the guides.

5. Information collection and data analysis

Unlike structured exams where only one answer is expected from the students, the guide questions require multiple activities and the synthesis of different types of information before they are answered. The time has come for students to share the information gathered, to share their ideas, to debate, to elaborate hypotheses, to structure the information and to look for the best answers to the initial question among all of them, taking into account the knowledge of the subjects *Speech Therapy I and II*, *Psychology IV* and *Didactics of Natural*

Sciences with a common core, that is, to look for the transdisciplinary for the elaboration of the final project.

6. Elaboration of the product

The students in this step, will have to apply what they have learned to the realization of a product (lesson plan of the subject The world in which we live), as an answer to the guiding question or problem to be solved. The teacher makes a motivation to the students that encourage them to give free rein to their creativity.

7. Report the results of the project

By completing the above steps, students are able to present what they have learned to their colleagues in the collective and show how they have responded to the initial problem. It is important that they have a structured script of the presentation, explain themselves clearly and support the information with a variety of resources; in this case they will be able to refer to

Theme, general objective, regularities of the instruments applied, most important cognitive core concepts in the project, presentation of the final product, use of the Tics.

The exhibition will make it possible to give a collective answer to the initial question. Once the presentations of all the groups are concluded, reflect with your students on the experience and invite them to look for a collective answer to the initial question taking into account those already exposed by the teams. Reflect on all the answers which you consider to be the most complete or effective.

6. Evaluation

The evaluation is done at the end of the project; the criteria are given by the objectives, goals and tasks. The teacher evaluates taking into account the objectives proposed by him, determines how much he managed to integrate the subjects to the subject of the project, which participation and welcome was generated in other people outside the group, if the tasks performed were relevant to deepen the subject of knowledge. It should also be taken

into account whether students achieved progress in thinking skills, argumentation, concept building, and interaction with peers as solidarity, respect, self-care and space around them.

Project progress reports provide the basis for follow-up reviews as well as reflection. Students are often the best critics of projects. In this case, to know the progress of the group in the development of the project, we used email, telephone, interviewing randomly selected students, reviewing draft writings, reviewing steps and their responsible, conducting information sessions at the end of activities.

1. Monitoring project progress can be used to detect problems, change strategies to improve results.
2. Results obtained with students:
3. Study and deepening of cognitive cores necessary for the elaboration of the project from the consultation of bibliographies and didactic materials of the subjects Speech Therapy II, Psychology IV and Didactics of Natural Sciences.
4. Diagnose the didactic needs of the teachers in the teaching unit where they carried out the project in the subject The world we live in.
5. Proposal of actions directed to the treatment of the regularities detected in the application of the research instruments.
6. Elaboration of a class plan for the subject The world we live in from 3rd grade, where the subjects Speech Therapy II, Psychology IV and Didactics of Natural Sciences are highlighted as the core, as a response to the transdisciplinary work for a better social inclusion based on the local priorities of the territory.
7. Use of ICTs as resources that show the professionalism of students in the search for information and its use in the product presented.

Conclusions

At the conclusion of the work, it was found that the project learning method

Enables students to communicate their ideas, make discoveries in their acting context and self-manage their knowledge

Strengthens the knowledge and skills in Educational Research Methodology from the application of techniques to verify the problem under investigation.

Powerful collaborative work, own initiative, skills with ICTs.

Recognizes group work, values contributions and respects the rights of others.

The teacher becomes a resource provider and a participant in the learning activities.

Learning passes from the teacher's hands to the student's, so that the student can take charge of his or her own learning, without continuously controlling the progress of the different project tasks.

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