

Training Through Classroom Pedagogical Projects with ABSTI Approach: An Articulation Challenge Between Higher Education and Primary Education

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Abstract: This research presents the research developed to identify the stimulated investigative skills in the students of the primary educational level through the pedagogical projects of classroom with Learning Based on Solution of Investigative Tasks Approach (ABSTI). Qualitative study based on the theoretical contributions of Murray, Mejia, Moreno and Sanchez. The study was carried out in an educational institution of the southern region of Colombia region that implements ABSTI, the data were analyzed through the qualitative technique of identification of relationships, activity-operation-investigative ability where the profile of investigative skills raised by Moreno was taken as a reference. It was found that through classroom projects activities, the investigative skills of perception, instrumental, thinking, conceptual construction, methodological construction, social construction of knowledge and metacognition are stimulated. The results show that investigative initiation is not an exclusive activity of the university in addition it is proposed that the education systems focus their attention on articulating and aligning the research training processes between primary and university education. Finally, this research points out why ABSTI is a pedagogical strategy for investigative initiation.

Key words: Investigative initiation, Learning Based on the Solution of Investigative Tasks (ABSTI), investigative skills, classroom pedagogical projects, stimulated investigative skills, qualitative technique

INTRODUCTION

The difficulty to investigate in the university students lies in the investigative abilities of instrumental order of thought and of conceptual construction. The difficulties are in basic cognitive operations such as writing, reading, deducting, analyzing, interpreting, synthesizing, observing, asking, generating ideas, reflective thinking, critically and logically. These skills must be developed in basic and secondary education. There are fundamental skills that students must master to achieve success in any subject before they start university education (Zamora, 2009).

According to Sanchez (2014), teaching research is not a matter of definitions but of practical and operational knowledge. More than a problem of concepts it is a matter of strategies of tasks and practices of skills and abilities. The complexity of the research process is related to operations that must be developed from the first year, therefore, this statement completely invalidates the postulate of research training as a direct faculty of university academic programs.

According to the postulate of Bayardo (2005) informative research there are skills that can and need developed in basic education allowing performs multiple complex tasks for human. This planning emphasizes the need for an investigative initiation from early childhood and primary education and not wait for higher education. Thus, is interesting investigate the extent to which these investigative skills are developed at an early age.

To develop this research it was considered feasible to study the classroom pedagogical projects of an educational institution of the South-Colombian Region which aims to learn based on the solution of investigative tasks in early childhood and primary education and focus their interest in awakening the investigative spirit in their students. The objective of this study is to identify the profile of investigative skills that are stimulated in the students of early childhood and primary education through the Learning Based on Solution of Investigative Tasks (ABSTI). The theoretical support of the study is related to early research training, research skills and classroom projects with ABSTI approach.

The investigative initiation since when and how to teach research? Training in research is a deliberate, gradual and demanding process that demands the assimilation of knowledge, attitudes and mastery of thought operations. Their teaching must be oriented to the development of skills from the direct participation of the student and the accompaniment in the proper exercise of the research activity.

Sanchez (2014) states that the best way to teach research is by participating in the effective practices and processes of research. This approach highlights several relevant aspects of didactics in the teaching of research, questions the current modalities that revolve around a formal, conceptual and documentary teaching of research and highlights the need to teach research from the direct participation of the subject in the research process. Rizo (1997) adds that basic skills are required which students do not develop before university and therefore, acceptable management of the research methodology can not be expected. Moreno (2011) explains that training for research should be incorporated as a formative purpose in all the student's school stages as well as early training as a work tool. Initiate early research training is a priority that should not wait until the university, these skills should be developed from the initial education, since, they will allow the realization of multiple complex tasks of the human in all areas of its existence (Bayardo, 2005).

On the other hand, the investigative congenital baggage with which it is born is highlighted. Gopnik (2012) highlights that children use data to formulate and test hypothesis and theories in the same way that scientists do. Scientists learn about the world in 3 ways; they analyze statistical patterns in data, they do experiments and they learn from the data and ideas of other scientists. Recent studies show that children also learn in these ways and that they often resemble ideal Bayesian trainees. In the same way (Murray *et al.*, 2016) affirms that the development of the human brain makes us natural scientists. Early research is an essential and universal part of what makes us human. In this way, the development of the human brain is intrinsically related to early research.

Research skills: The complex of operations that research requires is what rigorosity in the development of investigative skills demands. The mastery of the investigative skills supposes something beyond the appropriation of the investigative procedure of the planning, execution, evaluation and communication or of the generalizing actions of the scientific method (Montes de Oca and Machado, 2009). Bayardo (2005) states that investigative skills are the set of skills of

diverse nature which begin to develop before the individual has access to systematic processes of training for research which mostly are not developed only to enable the realization of the tasks of the research but which have been detected by the trainers as skills whose development in the researcher in training or in functions, is a fundamental contribution to empower him/her to carry out research of good quality.

Classroom projects with a learning approach based on the solution of investigative tasks: For Mejia and Manjarres (2011) the approach of research as a pedagogical strategy is not that children become scientists but that they are able to put those issues into their daily lives. Thus, classroom projects are one of the strategies that aims to develop research skills at an early age while resolving problematic situations of their social, natural, economic and cultural environment (De Faria and de Alizo, 2006).

As Gonzalez and Portillo and Zabala refer, a classroom project facilitates the development of educational processes based on interests or problems, through a collaborative exercise, promoting classroom research and motivation for learning. By dynamizing content around a research problem, the exercise of multiple operations is promoted to give meaning to knowledge regarding a research interest and to build new knowledge. Similarly, the globalizing approach in which Gonzalez frames the pedagogical projects of the classroom, determines them as a fundamental tool for an integral education. Additionally, classroom projects promote meta-cognitive skills as they involve reflective, problematizing, planning and proposing thinking in order to find a solution to problems or their own stated interests.

Consequently, classroom projects become a tool to promote classroom research (Pasek de Pinto, 2007), therefore, it involves students in a research process that stimulates their scientific interest and a number of investigative skills.

MATERIALS AND METHODS

This qualitative research has as a general objective to identify the research skills that are stimulated in the students of the primary educational level, through the learning based on the solution of research tasks. For this, described the activities carried out by the students through the classroom projects in order to respond to their research interests and the relationship between the activities developed in the classroom projects and the research skills that are stimulated in the students was

established. Habilidades investigativas que se estimulan en los estudiantes. The study was carried out in an educational institution of the South-Colombian Region that implements the strategy of classroom projects with ABSTI approach. The population was comprised of the teacher advisors of each classroom project, the students of primary education of the 1st-5th grades and the coordinator of the projects of the classroom. The sample consisted of 5 teacher advisors of each project of classroom, 172 students and 1 coordinator of the projects of classroom.

The 3 questionnaires, 1 observation card and 1 record card were designed and applied for collection of information. The instruments were designed based on three categories of analysis, activity, intentionality and ability. The instruments were validated by 2 experts and a test group with 30 students. The questionnaire addressed to the students was designed for children and the questions focused on 3 aspects, activities carried out in the classroom projects what he likes what he does not like about the projects and the learning that has been given through them. These aspects comprise 2 of the analysis categories, activities and skills. In addition, a film recording was made during the 3 moments of the workshop in order to have the information in detail to be analyzed later.

The information was collected according to the following order, review of the institutional document of the classroom projects. Interview with the coordinator of the classroom projects. Focus group with the advisory teachers. Workshop with students. Documentary review of field notebooks and journal of publication of project results. Observation of the stage of socialization of the classroom project.

The analysis of the information was done in the following way, categorization and systematization of the information collected. Triangulation and interpretation of the information collected with teachers, coordinator and students. Interpretation of the information gathered in the documentary review of the field notebooks, explorando-ando magazine and direct observation of the socialization of the classroom projects. Processing of the information to respond to the objectives. Identification of relations between activity-operation and investigative ability. The data were analyzed through the qualitative technique of identification of relationships where they were associated with the profile of investigative abilities raised by Bayardo (2005).

RESULTS AND DISCUSSION

It was evidenced that the classroom pedagogical projects are related to the development of a research

project in the classroom where the students pose a research question and design a route of activities to answer it. From these findings, 10 types of activities that are developed in the primary classroom projects were identified. The activities were identified the specific operations that demand the execution of the student (Table 1).

It was evidenced that the activities identified in the classroom projects have a strong investigative component that demands from the students mastery of operations that end up becoming a stimulus of investigative skills. In this way, the investigative skills that are stimulated in students through classroom pedagogical projects with ABSTI are perception skills, instrumental skills, thinking skills, conceptual construction skills, methodological construction skills, social construction skills of knowledge and cognitive goals, according to the profile proposed by Bayardo (2005). The relationship found between the activities of the classroom projects and the investigative skills of Bayardo (2005) is highly correspondent, since, the classroom projects are aimed at developing a research interest, therefore, it weaves construction processes in this field. As shown in Table 2, each activity of the classroom projects stimulates several skills at the time, since each activity of the projects involves a variety of operations that are closely related, articulating a diversity of research skills in a single activity.

Perception skills: Projects in the classroom stimulate perception skills through activities to collect information and compare theory with practice because students put their senses into practice to extract information from the environment and make sense of their research. An important relationship is found as the projects in the classroom have as a main exercise a result of direct observation of the school context in order to expand their perception of what surrounds them in environmental, physical, social, etc. and there are abstract perceptions which then generate interests of inquiry.

Instrumental skills: The activities focus on mastering the basic operations for performance in any disciplinary field which are related to generic competences that is to formally master the language; read, write, listen and speak. The activities of the projects in the classroom promote these skills, not only to promote reading and writing but also for the motivation exercised in the student's experience of researching, reading and writing about the subject of their own interest, since, the student learns what is important and significant to him.

Table 1: Operations that involve each activity of the classroom projects

Activities of classroom pedagogical projects	Operations involved
Activities of motivation for research and approach to how to investigate	Interest in exploration Astonishment Terminological appropriation Sensitivity to phenomena Intuition
Activities of group work and strengthening of values	Team work Values such as respect, tolerance, help, responsibility and sharing Assume commitments to oneself and transformation of the environment that surrounds it
Activities to define a research interest	Observation Amplitude of perception Selective perception Inquiry Questioning reality Curiosity Generation of ideas Proposal of questions Establishment of agreements Structuring a research question with order, logic, context and delimitation Listen out Defense of their ideas but respecting those of others Approach a research problem defining what they want to solve or know Decision making Selective perception Perception construction
Activities to plan and execute the collection of information and the confrontation of theory with practice	Planning activities Query Interpretation, intuition analysis and information relationship with your research question Comparison Confrontation of theory with reality Experimentation Testing
Activities to tabulate the information interpret it and draw conclusions	Relationship of knowledge that is acquired Interpretation and understanding of the entire process Analysis of collected information Construction of results Conclude Synthesize
Openness to reflection	Reflective thinking Propositive and transformative thinking
Socialization and exposure activities	Generation of opinion Dissemination of results Make learning known Communicate results construction processes Appropriation of the specific language of the research topic
Reading activities and textual production	Expression in public Read comprehensively Communicate processes, learnings and results in written form Creativity Literary production based on the research topic Use the elements of writing correctly
Interdisciplinary activities	Relate acquired knowledge Apply interdisciplinary knowledge in the development of your research

Thinking skills: In this complex of skills are related the activities of openness to reflection, interdisciplinarity and definition of a research interest. The process that students perform to solve their research question, leads them to demand cognitive and cognitively from all disciplines of knowledge to solve their own research problem. Walking after responses of a real situation generates curiosity and the need to search, interpret, analyze, relate and build knowledge which contributes significantly to the development of thinking skills. In addition, the exercise that students carry out through their field journal is to write an individual reflection about their

research process. This causes them to develop reflective thinking, since, they are carefully contemplating what they did in the classroom project which requires introspection of their own state of mind to understand what they are doing to make judgments and to assume commitments.

Skills of conceptual construction, methodological construction and social construction of perception: These activities make classroom pedagogical projects a strategy with multiple benefits for the development of research skills of conceptual, methodological and social

Table 2: Relation of research skills with activities of classroom projects

Skill	Investigative activities of the class room projects related
A: Perception skills	Activities to collect information and compare theory with practice Activities to define a research interest
B: Instrumental skills	Reading activities and textual production Activities to define a research interest Activities to plan and execute the collection of information and the confrontation of theory with practice
C: Thinking skills	Interdisciplinary activities Openness to reflection activities Interdisciplinary activities Activities to define a research interest Activities to define a research interest Reading activities and textual production Opening activities for reflection
E: Methodological construction skills	Activities to plan and execute the collection of information and the confrontation of theory with practice Activities to tabulate the information interpret it and draw conclusions Activities of motivation for research and approach to how to investigate
F: Skills of social construction of knowledge	Activities of group work and strengthening of values Socialization and exhibition activities Interdisciplinary activities
G: Meta cognitive skills	Opening activities for reflection Socialization and exhibition activities

construction of knowledge. In this way, the activities developed by the students are gestated around their own investigative question, a strategy that generates the need to carry out a systematic and deliberate process of inquiry, information gathering, information processing and knowledge building in a natural way to fulfill the purpose established by the same student. The foregoing, makes the student necessarily stimulate the methodological field of research.

Metacognitive skills: Metacognitive skills are stimulated through projects in the classroom because they exercise the mental processes involved in metacognition (Martí, 1995). In the same way, the students exercise the monitoring during the realization of the task when verifying, rectifying and reviewing the strategy used according to the proposed objective. They evaluate the results at the end of the task when they draw the conclusions of the investigation and verify that they have been able to answer their question and assess the effectiveness of the strategy used. Through projects in the classroom, students are aware of their limitations and ignore the topic before investigating it. They identify and define a research problem and plan actions to solve it reflecting on the action they are going to undertake. Reflect on your cognitive activity when you register in the field diary. They reflect the process all the time where they register their aspect in front of each activity that is being developed and the understandings they are achieving with respect to their research objective which is to answer the research question. They supervise and evaluate the implementation of the plans. Through the magazine exploring and the socialization of the classroom projects to the community where the students communicate the results of their research, the processes of construction of

those results and the acquired learning, the 7 research skills raised by Bayardo (2005) that are stimulated. in students where none of the 7 investigative skills identified becomes less important.

CONCLUSION

Research training should begin in the early childhood and primary education and not in the university. Therefore, it refers to the importance of stimulating research from the first year of age in order for young people to enter higher education institutions with sufficient investigative skills.

The research initiation should be promoted in a transversal way in the curriculum of the school and accompanied by the formality of strategies that allow learning from the solution of investigative tasks. The formative approach must have a pedagogical intention to stimulate investigative skills but not methodological techniques. It should focus on the practical exercise of research that allows the stimulation of the ability to wonder, curiosity, knowing how to observe, ask, interpret, analyze, compare, conclude, hypothesize and experiment to prove.

Children are curious but the educational systems are structured in such a way that they privilege the curricular structure and restrict the creativity when in fact they must be immersed in an active learning that stimulates the capacity of amazement and offers early opportunities of investigation to take advantage of their instinctive curiosity. Educational systems should align the process of research training between the university and the school through pedagogical strategies that stimulate research thinking. The classroom projects with investigative focus is a very good option.

As demonstrated in this research, classroom pedagogical projects with ABSTI focus are a research initiation strategit with results which transcend from a reproductive education to one of construction and meaning. They are structured as a research process in the classroom from the research interest of students and their direct participation in the approach of a real problem, the planning of a route to answer your question, the collection and processing of information, the determination of results and the disclosure of how knowledge was built what they learned and what they concluded. Thus, classroom projects promote scientific initiation that stimulates investigative abilities of perception, instrumental, thought, conceptual construction, methodological construction, social construction of knowledge and meta-cognitive. It awakens the investigative spirit of students in early childhood and primary education, provoking in the depths of their being, an interest in research and fostering a scientific lifestyle what leads to a way of being and thinking from reflection, logic, questioning, curiosity, analysis, verification, structuring and thirst for knowledge.

Through the strategy of classroom pedagogical projects, activities are developed that exercise the domain of operations involved in the investigative act. The activities identified are motivation for research, approach to how to research, group work activities and values strengthening, activities to define an investigative interest to collect information and compare theory with practice, activities to tabulate information, interpret it and draw conclusions, activities of openness to reflection, activities of socialization and exhibition, reading activities, textual production and interdisciplinarity.

With the early research initiation, the contributions that man makes to science will increase which will contribute significantly to the quality of life. "Delaying the commitment and experiences of students in research is pedagogically out of date, short-sighted economically and wasting human capital and invaluable human potential" (Murray *et al.*, 2016).

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