Self-regulation of Learning through the Pro&Regula Program

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Abstract

This article presents the Pro&Regula program as a working tool, integrated into daily classroom teaching-learning processes, and whose purpose is to encourage learning regulation processes.

Starting from the importance of pupils' learning to learn, we consider how students need to become familiar with how one learns and what must be done in order to learn better (self-regulation in learning). In fact, behaviors of self-regulated learning are given a great deal of importance since they improve the quality of learning and of the pupils' performance.

Toward this end we put forward a sequenced methodology for encouraging the teaching of self-regulated learning procedures for students; this is applied in an alternative, reflexive fashion while carrying out the ordinary activities of instrumental curriculum areas.

Keywords: self-regulation, metacognition, learning strategies, teaching strategies

Introduction

In line with contributions from such authors as Bruner, Ausubel, Mayer, etc., who share a constructivist, cognitive idea of learning, we conceive of school learning as a "process of knowledge construction, cognitive and complex, successive and recurring, where the student must make various decisions about how to executive the process in a conscious way (regulating it) so that significant new knowledge is incorporated into schemas of already existing knowledge".

LOGSE[1] echoes this need, defining the benefit of students' "learning to learn" in its "methodology guidelines" for the different curricula. The principle of "learning to learn" is supported by the idea that we as persons can improve our learning capacity, if there is a guided educational intervention process that allows the person to construct different types of knowledge:

1. *Conceptual knowledge*. The student needs to construct a notion and conceptual representation about "learning" as a psychological process subject to change and improvement. The knowledge includes understanding the phases that human knowledge undergoes in order to process any information: task preparation (thinking before you begin), task execution (thinking while you perform) and performance review (thinking after you perform).

2. *Procedural knowledge*. The student needs to incorporate into his or her cognitive skills such skills as will allow for making conscious, regulated decisions about what should be "thought" or "done" when faced with any proposed learning. Diverse cognitive skills are developed, such as observation, analysis, synthesis, reasoning, etc.

3. *Conditional knowledge*. The student also needs to incorporate "strategic" knowledge that enables him or her to decide what best to do in order to successfully carry out learning or any activity. This involves having knowledge about knowledge itself, that is, knowing how one learns and what must be done to learn better. This type of knowledge includes knowledge that enables self-regulated learning.

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[1] Organic Law of 3 October 1990. This law reforms the Spanish Educational System in order to adapt it to transformations at a societal level. Purposes include: full development of the student's personality, training in respect for fundamental rights and liberties and in exercising tolerance and freedom within democratic principles of living in community; acquisition of intellectual and technical work habits, as well as scientific, technical, humanistic, historical and aesthetic knowledge; preparation for practicing professional activity; training in respect for linguistic plurality and Culture of Spain; preparation for active participation in social and cultural life; training for peace, cooperation and solidarity among peoples. This law regulates General Order Education (preschool, primary, secondary, *bachillerato*, professional training, special education), Special Order Education (artistic and languages) and Adult Education.

4. *Attitudinal knowledge*. The type of knowledge entails students' enjoyment of managing and optimizing their own learning, having developed attitudes of pleasure and enjoyment in the way they improve their learning.

For these reasons it seems coherent to take on an educational goal of dispensing enough help for students to learn to consciously execute such a process, and consequently, to acquire skills for learning to learn.

Focusing on self-regulated learning, we must make clear that self-regulating behaviors have great importance: the quality and degree of elaboration of learning itself depends on these. This importance has been brought out by some models that put special emphasis on meta-cognitive skills of awareness and control during learning (Zimmerman, 1989, 1995). Similarly, recent papers have claimed better learning and performance from students with this type of knowledge and with self-regulation repertoires (Jorba & Cassellas, 1997).

Classic approaches to learning have emphasized study techniques (summarizing, underlining, making tables, etc.) as essential skills for successfully accomplishing the learning process. This assumption has been shown to be inadequate, since knowledge of learning techniques or microstrategies without a strategic knowledge or knowledge of the macro-strategies that contribute to learning is, from any angle, insufficient for processing knowledge at a deep level or with significant construction (Monereo, 1990). However, the confusion between knowledge of study techniques and strategic knowledge continues to be common in our educational environment.

Self-regulation strategies during study are a type of knowledge, essentially conditional, that allows students to optimize their handling of current knowledge, both procedural (cognitive and dexterity-related) and attitudinal (Coll, Pozo, Sarabia & Valls, 1992), which is constructed during learning. This metacognitive or strategic knowledge entails diverse implicit knowledge (Flavell, 1987):

1. Knowledge about awareness of the learning process, with respect to itself (skills and limitations), the task (characteristics and difficulties) and the strategy in question (advantages of different procedures in carrying out a task).

2. Knowledge about controlling the learning process, that is, planning, regulating execution, and evaluating it.

Given the relevant role of self-regulation strategies in the teaching-learning process, we developed Pro&Regula in order to encourage the teaching of procedures for "regulation in learning".

Objectives of Pro&Regula

The basic objective of Pro&Regula is two-fold:

1. With regard to teachers:
    -   Provide them with conceptual and procedural knowledge which allows them to be aware of and work on this type of strategic knowledge with students, incorporating this teaching into ordinary teaching-learning processes.
    -   Propose specific teaching strategies which encourage students to learn self-regulated behavior while performing daily learning tasks or activities.
2. With regard to pupils:
    -   To develop learning habits that make the principle of "learning to learn" a reality.
    -   Help students be more "strategic" and become the protagonists in their own learning.
    -   Respond to different learning difficulties in the students, brought about by the way they execute the learning process.

Characteristics of the Pro&Regula program

The Pro&Regula program, at levels 1 and 2, seeks to provide a working tool which can be integrated into daily teaching-learning processes in the classroom. It offers the teacher a sequenced methodology for encouraging the teaching of regulated learning procedures for students, using ordinary activities from the instrumental curriculum areas as a resource.

As for the pupils, they are offered different activities similar to those performed daily in their subject areas, proposing an alternative, reflexive manner for carrying them out. Thus they are "guided" through the cognitive path that should be followed in order to carry them out. Pro&Regula aims to help construct conditional knowledge in the students which encourages the regulation process in learning, in multiple procedural learning areas.

For this purpose, the following types of student knowledge are systematically worked on:

1) Reflexive knowledge, or **learning awareness,** includes:

1. Knowledge about **task characteristics** refers to the learner's awareness of the task's requirements and difficulties, given its demands or characteristics. It includes knowledge of what to do, how to do it, when and where to do it, according to the type of knowledge or learning task that must be performed.

2. Knowledge about **the way one learns** refers to one's own abilities and limitations with respect to different ways of processing information or of constructing knowledge. It includes knowledge of what I do, how I do it, when I do it and where I do it --usually-- in order to acquire a given type of knowledge.

3. Knowledge about the **cognitive process and strategy in use**. This includes knowledge of what is done, how it is done, when it is done and where it is done. It involves general beliefs and beliefs specific to each subject matter as to what it means to learn and how one should learn.

2) Knowledge about **control of the learning process**, while it is underway, allows one to adjust the learning that is being produced while performing the activity in question. It in turn involves other types of strategie knowledge:

1. Knowledge about **planning one's learning**. This involves knowing what to do, how to do it, when and where to do it in order to plan one's learning. This knowledge can be acquired through instruction from others and from one's own reflection.

2. Knowledge about **regulation during learning execution.** This involves knowing what to do, how to do it, when and where to do it while the learning process is underway.

3. Knowledge about **carrying out evaluation** once a task is completed. It involves knowing what do to in order to evaluate one's own learning process in addition to knowing how and when to do so.

Self-regulated learning procedure used in this program

As we stated earlier, Pro&Regula can be used in the execution of any activity from the different instrumental curriculum areas.   For that purpose we propose a series of steps, systematized and sequenced, that the student should perform before, during and after the activity that is to be carried out.

We understand that learning to self-regulate consists of knowing how to think at the beginning of an activity, how to think and do while performing the activity, and how to think at the end of the activity. The whole process that we are about to flesh out is sequenced based on these premises.

Once the activity to be performed is set out, the pupil should analyze what he thinks and does when performing it. For this purpose we begin by having the student think about what the activity requires before taking any action, and plan its completion through a series of questions posed to raise awareness about the task requirements. Thus, he or she must respond to questions related to the activity, such as: Why do you think this activity is important? What are the learning objectives? What has to be done? What difficulties are involved? What parts does it have? Do you remember any similar task? What do you need to know? What do you not understand? What do you know and not know about the activity? Other questions refer to how one does the activity: Is this new for you? Have you done other similar ones? What aspects do you correctly carry out? What mistakes do you make? A series of questions we might consider prior to planning are also formulated, such as: What strategies can be used to resolve the activity? What techniques can be used? What ideas can help you to perform it?

At this point we consider that the pupil is ready to plan execution of the activity, so we suggest that he or she thinks about and describes the steps to be carried out, including what will be done at each step. This is the right moment for proposing both learning goals and goals for personal improvement.

Once the planning is completed, we move on to carrying out each and every planned step so that the formulated activity is resolved. It is important in this phase that the student thinks about maintaining motivation, about directing his or her thoughts while performing, and about how the task must be carried out.

When the activity is completed, we move to the following phase of Pro&Regula, where the student is to think about what he or she has thought and done up till then, before the task (awareness and planning) and while performing it. It is important that the pupils reflect not only about the activity, but also about themselves and their way of doing the activity, and about how it should be done. They will try to answer such questions as: Did you notice all the difficulties that were involved? Did you set goals? Did you set out to do a good job? Did you perform all

the steps you planned? What mistakes did you make? etc. Furthermore, in order to complete this phase, students must consider from their own perspective what aspects should be improved for the next time, with regard to the activity itself, how it is done, and about themselves.

Finally, and in conclusion, we ask the students to reflect about what they have learned in thinking about the activity itself, the way it is done, and about themselves.

Structure of activities proposed in the program

The structure of activities in Pro&Regula is based on previous research about student difficulties in constructing different types of procedural content found in the Primary Education curriculum, using self-reports from a wide sample of teachers (De la Fuente, 1999a).

Based on this evidence a sequence of procedural content was established for working on self-regulation of learning; teachers consider the sequence to have mid-to-high level of difficulty.

Pro&Regula is structured in two levels, 1 and 2. Both levels are intended for use in 2nd and 3rd cycles of Primary [*N.T.* each cycle is two years], although preferably for use in 4th, 5th and 6th grades.

Procedures dealt with at each level are distributed as follows:
a) **Pro&Regula 1:**
   - I am learning to learn: I think in order to self-regulate.
   - Interpretation of spatial situations and simple graphics.
   - Classification into different data or groups according to given criteria.
   - Formulating figures based on other ones.
   - Establishing relationships between temporary quantities.
b) **Pro&Regula 2:**
   - I am learning to learn: I think in order to self-regulate.
   - Carrying out interviews and questionnaires.
   - Comparing, varying and ordering of texts with the structure of language.
   - Analyzing causes of natural phenomena.
   - Spelling application.

- Elaboration and interpretation of figures and tables.

At the end of the procedures, Pro&Regula offers the student a self-evaluation that can be used either as an initial evaluation, to detect what self-regulation strategies are being used; or, as an end-product evaluation, with the purpose of detecting the degree of transferral and use of self-regulation strategies learned.

Methodological Guidelines

It is worth underscoring that the proposed learning, given that it requires reflection and self-knowledge on the student's part, depends on how the teaching process is carried out. This means that the teacher has an irreplaceable role in program application. In order to carry out the different activities a series of methodological principles must be kept in mind:

- **Preparation and motivation**. Students should be prepared in advance for these activities, since they are not the usual. The activities may themselves create learning difficulties if such preparation is not carried out, and if initial motivation is not addressed, explaining the *why* and *what for* of completing them (De la Fuente, 1999b).

- **Support through interaction**. This program is not designed for the student to complete it alone. On the contrary, it requires both personal reflection, promoted by the teacher, and joint reflection, carried out with classmates upon completing each part of each activity.

- **Attention to qualitative aspects of the learning process.** Unlike other programs in use, where the sequence and quantity of activities are such that they are independent from daily classroom activities, Pro&Regula uses a different approach. Activities proposed should be done along with activities from each area of learning, as a way of making students reflect on the activities they perform daily, and so learn to self-regulate. For this purpose, the number of activities proposed for learning each procedure is limited, given the assumption that the quantity of learning activities carried out does not always bring about improvement in performance quality, if strategies like those proposed in the program are not being taught.

- **Systematic teaching and learning.** The students' acquisition of regulatory skills in learning requires repetition of sequences through different types of activities so that the students can generalize them to different types of procedures. For this purpose,

students should first be trained through program activities, and afterward they should apply skills developed to daily situations when performing other assigned activities.

Evaluation

Evaluation of learning promoted through Pro&Regula should be carried out in a qualitative, continuous and process-related fasion, in order to gain sufficient information about problems students have in performing activities, as well as about their achievements. Toward this end it is helpful to use different evaluation strategies:

1) As for the teaching process:

- Preparation and motivation of students toward the learning process.
- Teacher's help and participation during implementation of activities.
- Joint reflection produced upon finishing each part of the activity.
- Teacher involvement and conviction about the effectiveness of this type of activity.

2) As for the learning process:

- Observation of the child's behavior during task performance.
- Dialogue upon finishing each phase or stage of the activity, in order to gain precise information about it: awareness, planning, execution, evaluation.
- Qualitative analysis of activities present in the program: how they solve them, the amount of help required, results, collaboration and dialogue with classmates, cognitive operations used, etc.
- Qualitative analysis of skills put to use at each point: self-questions, decision making, error detection, change in goals, etc.
- Generalization of self-regulation strategies to daily activities.

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