Education & Psychology I+D+i
Research, Innovation and Solutions on-line
Editorial EOS

Improving the Teaching-Learning Process through Psychoeducational Advising

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Abstract

Introduction: In recent decades there has been a well warranted interest in the topic of self-regulated learning, or more recently, in developing the competency "*learning how to learn*". Research has shown substantial differences between those students and teachers who work along these lines, as compared to others who do not. This paper studies the effect of an Advisory Program with regard to the way teaching and learning are *designed* and *developed* (carried out). Our point of reference is the DEDEPRO™ model (DEsign, DEvelopment and PROduct), referring to regulation and self-regulation of the teaching and learning process (De la Fuente & Justicia, 2001, 2004, 2005). The research takes place in the area of educational guidance, as part of the advisory function offered by the provincial-level Office of Guidance to the Guidance Departments at the secondary schools.

Method: A total of 21 teachers and 561 students participated in this experience in educational innovation. A quasi-experimental design was used, with pretest and posttest measurements, and a non-equivalent control group. Based on methodological strategies which the teacher incorporated into his or her daily practice, differences were measured using the Scales for Interactive Assessment of the Teaching-Learning Process, IATLP (De la Fuente & Martínez, 2004), both student and teacher versions. In order to prepare the teachers, a training process was carried out, supported by the Teacher Development Center in Almería, and in collaboration with Education & Psychology I+D+i (Almería), which performed an advisory role in the design, intervention, measurements and data processing, as well as EOS (Almería), who provided the instruments.

Results: Scores obtained from the inferential analyses showed that the intervention produced significant effects in specific teaching and learning behaviors, as expected, in comparison to the control group. These were more profound in the area of teaching and learning process Design.

Discussion: This experience shows that it is possible to improve the competency of *teaching how to learn* (for teaching staff) and in *learning how to learn* (for students), in ecological contexts, through the Guidance Department, especially if the latter takes on its potential functions in Research & Development & Innovation (R&D&I).

Keywords: self-regulated learning, regulated teaching, DEDEPRO model, student-centered teaching, Psychoeducational consulting.

Received: 08-14-07 *Initial acceptance: 10-08-07* *Final acceptance: 10-15-07*

Introduction

Research on self-regulated learning focuses on understanding how to carry out strategic information processing and self-regulated academic action in order to assure academic success (Archer, 1994; Elliot & McGregor, 1999; Greene & Miller, 1996; Wolters, Yu & Pintrich, 1996; Monereo, 2006). In formal education there is a special sensitivity to developing basic competencies, especially *learning how to learn* (Badia & Monereo, 2004; Valle, Cabanach, Rodríguez, Núñez & González-Pienda, 2006). Interest in including the development of academic competencies in teaching-learning processes has received special attention since the European Council in Barcelona in 2002, whose objective was citizens' mastery of these competencies by the year 2010. In November 2004, the European Commission published a document entitled "Key competencies for lifelong learning", which mentions *learning how to learn* as one of the basic competencies for all citizens.

This context draws increasing attention to factors which differentiate academically successful students from the unsuccessful (Rosário, Núñez, González-Pienda, Almeida, Soares & Rubio, 2005). Other studies show that a learning-centered orientation is related positively to use of both cognitive and metacognitive strategies (Pintrich, 2000; Wolters, 2004; Wolters, Yu & Pintrich, 1996) and a student who succeeds academically can be considered a "self-regulated student" (Allgood, Risko, Álvarez, & Fairbanks, 2000; Garavalia & Gredler, 2002; Monereo, 1990; 1993; 1997; 2006; Nota, Soresi & Zimmerman, 2005; Pintrich & DeGroot, 1990; Williams & Hellman, 1998, 2004; Zimmerman, 2002; Zimmerman & Bandura, 1994).

Research that delves further into educational practice for optimizing the teaching-learning process (hereafter, T/L) is justified on the basis of: a) a significant percentage of school failure; b) low levels of motivation at school; c) an unsatisfied, disillusioned sector of

the teaching profession; d) a certain questioning of the effectiveness of the educational system, and so forth. Along these lines we find papers on self-regulation which integrate concepts such as *learning strategies, metacognition, learning objectives, student motivation, learning orientation*, etc. (Boekaerts, 1997). From the different conceptions of regulation, we can gather meaningful contributions about the development of this basic competency.

Self-regulated learning as seen from the conception of the learning process

Self-regulation is important both in academic preparation and in the exercise of daily life; there is therefore a need to develop self-regulated students (De la Fuente, 1998; De La Fuente & Martínez, 2004). Within the field of education, and from the perspective of psychology, self-regulated learning can be defined as an active process by which a person establishes the objectives which direct his or her learning, by trying to monitor, regulate and control cognitions, motivations and behaviors, for the purpose of attaining the proposed objectives (Torrano & González-Torres, 2004; Valle, Cabanach, Rodríguez, Núñez & González-Pienda, 2006). Self-regulated *students* use cognitive, metacognitive, motivational and support strategies which allow them to meaningfully construct their knowledge. Such students perceive themselves as skillful, they increase their ability to be self-motivated and improve their own self-regulation process, in contrast to suffering anxiety in learning and avoiding educational opportunities, as is seen in students with low self-efficacy (Boekaerts, 2003; De la Fuente & Justicia, 1997, 2001; Pintrich, 2000, 2004; Winne, 1997 and Zimmerman & Kintasas, 1997).

The ability to self-regulate has to do with personal initiative, perseverance in the task and demonstrated competencies, regardless of the context in which learning occurs. "Self-regulating" students are aware that academic success depends above all on their work and involvement (Bandura, 2001; Zimmerman, Greenberg & Winstein, 1994; Zimmerman, 2002).

Self-regulated learning as seen from the conception of the teaching process

From the conception of the teaching process, self-regulated learning implies working on: a) initial evaluation and process evaluation (Sanmartín, 2006); b) providing information to students about the teaching process and how learning tasks are structured (Monereo, 2006);

and c) fostering self-regulation in students. The teaching process will be regulated to the extent that teaching, learning and evaluation activities are directed toward acquisition of autonomous, constructive, cooperative and diversified learning (Jorba & Cassellas, 1997; Jorba & Sanmartí, 1996; Luo, 2000).

The essencial characteristic is a teaching process focused on representation and appropriation of objectives, anticipating and planning one's action, and representing evaluation criteria as integral variables of the T/L process (Sanmartí, 2001, 2006). This model superficially touches on cognitive and strategic processes contributed from Psychology. Integrating these two perspectives (pedagogical and psychological) gives rise to a new model of regulated teaching which promotes self-regulated learning.

Self-regulated learning from the conception of the teaching-learning process: the DEDEPRO™ Model.

The DEDEPRO™ model integrates contributions from the conception which focuses on learning and on teaching (De la Fuente & Justicia, 2005; De la Fuente, Justicia & Berbén, 2005). Summarizing, this conceptual model assumes that there are deficits in teachers' design and development of the teaching process, and similarly, in students' design and development of the learning process. Furthermore, both effects are produced in an interactive, multiplicative fashion. This model has formed the basis of research at non-university levels (García, De la Fuente, Justicia et al., 2002; Sánchez, De la Fuente & Peralta, 2007) and at university levels (De la Fuente & Justicia, 2004; De la Fuente, Justicia, Cano, Sander, Martínez & Pichardo, 2003-2006; De la Fuente, Justicia, Sander, Pichardo, Martínez, Peralta & Berbén, 2007-2010). It deals with the target content of self-regulation in three phases or periods, as proposed by several authors (De la Fuente, Justicia, Cano, Sander, Martínez & Pichardo, 2003; De la Fuente & Martínez, 2004): DEsign, DEvelopment and end PROduct (DEDEPRO). This conceptual model forms the basis of the present research.

Regulated teaching and learning through use of information and communication technologies (ICT)

New information and communication technology (ICT) is changing our daily life and even subtly changes our way of thinking (Adell, 1997; Monereo, 2005). In the academic

realm, ICT is becoming more and more familiar and easy to use. ICT leads to attractive, motivating materials that can be used for educational purposes and also as a tool for promoting the competency *learning how to learn* (Laredo, 2006). ICT becomes a field of endeavor aimed at providing the subject with the necessary training to achieve autonomous learning (De la Fuente, Justicia, Cano, Pichardo, Martínez & Berbén, 2003-2006; Monereo 2006).

The appearance of ICT has given rise to a change in how young people store and use knowledge (Adell, 2007; Monereo 2005). ICT modifies how students study and act. Knowledge is not the storage of data, but rather knowing where to find and acquire data. Autonomous learning can be taught using general strategies (design and planning, with questions such as: what is the objective of this task?, what does the teacher want me to do?, what prior knowledge would be useful to me?, what procedures or techniques can I apply in this situation?, etc.) as well as with specific strategies. ICT can be a very useful element in this area.

It is useless to promote the use of new technologies and their effects on learning, if we do not first establish by comparison the effectiveness of such learning systems next to classical, well-used approaches. Some studies which addressed this topic did not find differences (Smith, 2000). Similarly, the effectiveness of these systems for more regulated, strategic teaching and learning has not been established, and is the object of this study.

Advising for the improvement of the teaching-learning process

The advisory function which the guidance department offers to other departments of a secondary school makes it possible to participate corporately and by consensus in experiences aimed at investigating how self-regulated teaching and learning are carried out, as well as to what degree students recognize and make use of specific methodological measures taken by teachers. Research on the improvement of teaching-learning processes falls into this field. The school's curriculum plan, the areas of its curriculum, the homeroom action plan and the educational interaction which takes place in the classroom constitute levels to be addressed professionally and organizationally.

With regard to the *Curriculum Plan,* a school psychologist supports teachers in preparatory and refresher training in educational topics (legal requirements, plans, knowledge typology, evaluation, etc.) and in collective decision making (Parcerisa & Zabala, 1996). Thus,

in the process of advising on the development of the basic competency *"learning how to learn"*, he or she must provide teachers with information on self regulation strategies, their nature and their usefulness when applied by students for learning, and about how to best teach these in each academic discipline, so that they are incorporated into class planning and put into practice within one's teaching effort.

The Spanish educational system establishes two stages of compulsory education. Primary education has six courses and covers ages 6-12. Compulsory secondary education includes four courses and addresses students from ages 13-16. At both levels students are grouped under a homeroom teacher in a fixed class group. The advisory model in our educational system has established three levels for taking action with students: the first is an institutional-type advisory function, performed by the provincial School Psychology team and which addresses the entire school community; the second pertains to the guidance department at a given school (especially in secondary education), its functions include defining how homeroom teachers are to follow up the students' learning process (Homeroom Action Plan); the third level consists in how the homeroom teacher carries out *tutorial action*. This is the function which seeks to maximize students' performance, and to the extent which students learn to self-regulate, their school performance noticeably improves. In this way, homeroom activity is a continuous support process, always working jointly and in coordination with the three pillars of tutorial action: the teacher, the student and his or her respective family (Figure 1). Improving teaching-learning processes through psychoeducational advising goes beyond traditional study techniques in the sense that one finds both macro-strategies and micro-strategies within self-regulation (De la Fuente, Justicia & Berbén, 2005), with study techniques being one component of the latter (Jorba & Sanmartín, 1996).

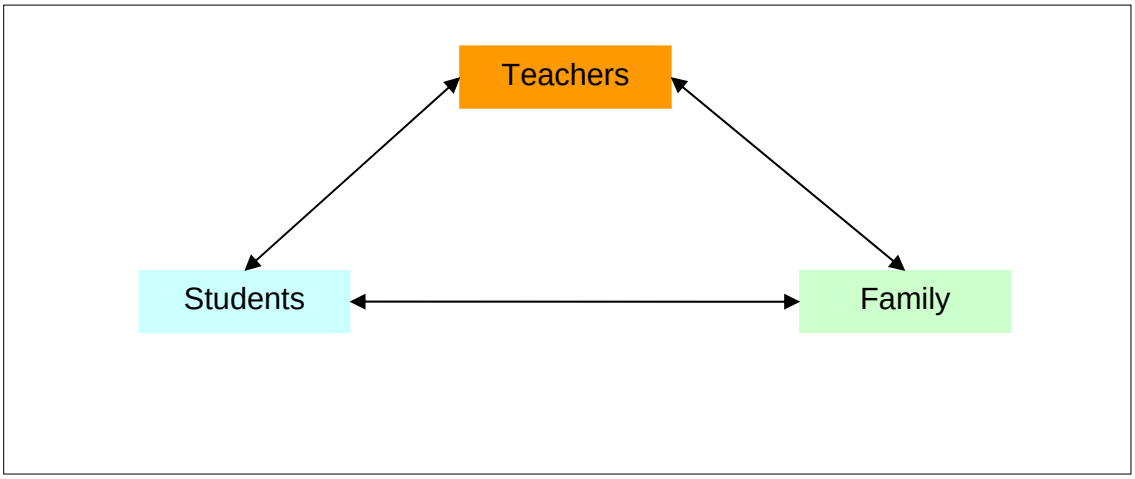

Figure 1. The *Tutorial Action Triangle*: Psychoeducational advising for self-regulated learning.

The *third level of advising and intervention: educational interaction in the classroom,* our final link in the chain, addresses students and their interaction with teachers. The objective is to train persons capable of self-regulation, skillful in knowing and using proper strategies to face a multiplicity of learning problems. Psychoeducational advising can provide assistance with different types of psychological aids to put into play when interacting with students, and can help teachers adjust and modify these for their best effectiveness. This involves not only knowing general ways to provide assistance, but also having sufficient mastery of the discipline to be taught.

Objective

The aim was to evaluate the comparative impact of an advisory intervention from the Guidance Department for Improvement of the Design and Development of the T/L Process, an activity pertaining to the *R&D&I Area (Research & Development & Innovation)* (De la Fuente et al., 2007).

Working hypothesis

Teacher interventions which aim to promote better regulation and self-regulation of the design of the learning process, by means of designing the teaching process, will have effects on the students, producing visible differences between the experimental and control schools.

Method

Participants

A total of 565 students participated. Of these, 326 belonged to the experimental group and 239 to the control group. There were 21 partipating teachers, with 12 teachers at the experimental school and 9 at the control school.

Procedure

The need for involving teachers in this Project sprang from professional development efforts taking place through the Teacher Development Center in Almeria. The model followed was DEDEPRO (op cit.), the Model for Regulation and Self-regulation of Learning. The external advisory process involved the co-participation of this researcher for the length of the school year 2005-2006. Each group from 1st to 4th year of Secondary Education received specific self-regulation strategies in some area of learning, according to the methodology covered in the teacher training sessions.

The *advisory program* consisted of reviewing and reformulating *lesson programming* and *didactic action* for the 2005-2006 school year, with the objective of evaluating and improving specific behaviors of design (classroom programming) and development (educational action) in the teaching-learning process. The IATLP Scales (De la Fuente & Martínez, 2004) were completed in order to obtain a self-evaluation of these aspects. Based on these results, teachers and students proposed specific behavioral objectives for improving both the design of each didactic unit (topic), as well as its development (focusing on self-regulation strategies). For this purpose, specific teaching and learning behaviors were chosen to be worked on during two four-month terms. In the final month of the school year, all behaviors were reassessed using the IATLP scales (op. cit.). Given the specificity of the behaviors worked on in the Advisory & Intervention Program, we expected that an increase in teaching and learning behaviors would also be specific and not general. The entirety of teaching and learning behaviors assessed in the IATLP scales is quite broad. The whole process followed the *Pro-*

tocol for Evaluating and Improving the Teaching-Learning Process (De la Fuente, 2007). In group meetings with the faculty, fundamental commitments were made for each class group, where only one teacher would intervene in the use of these strategies, and that moreover the whole teaching staff was in support of the intervention model.

Design

The design used was a descriptive type, correlational because it studied the associative, quasi-experimental relationships with pre-postest, using pre-formed groups as the criterion for assigning subjects. Variables used in this design were as follows (Table 1):

Table. 1. Variables

Independent Variables:	**levels**	**Dependent Variables:**	**levels**
▪ School	1. Experimental school 2. Control school	Design and Development of the T/L Process	1. Teachers 2. Students

Evaluation instruments

For the pre-test and post-test phases, the IATLP Scales were used (Interactive Assessment of the T/L Process), in their paper version (De la Fuente & Martínez, 2004). The different scales show consistent reliability and validity indices. See Table 2.

Table 2. Scale Structure for Interactive Assessment of the Teaching / Learning Process (IATLP)

Scale 1. Scale for assessing the design of the T/L Process - teacher version
Scale 3. Scale for assessing the development of the Teaching Process - teacher version
Scale 5. Scale for assessing the development of the Learning Process - teacher version
Scale 7. Scale for assessing the end product of the Learning Process - teacher version
Scale 2. Scale for assessing the design of the Learning Process – student version
Scale 4. Scale for assessing the development of the Teaching Process – student version
Scale 6. Scale for assessing the development of the Learning Process – student version
Scale 8. Scale for assessing the end product of the T/L Process – student version

Statistical analyses

The SPSS statistical program (v. 13.0.0), under license for use at the University of Almeria, was used for *treatment of data*. Table 4 details the structure of the scale for assessing the design of the T/L process, for both teachers and students. Due to the large quantity of effects and results from analyzing all the scales and subscales, this report will present detailed results only on improving the Design of the Teaching-Learning Process (IATLP Scales 1&2). The complete report of research results is published elsewhere (Sánchez, De la Fuente & Peralta, 2007).

Results

Teacher Results

1) Effect of the advisory program on the General T/L Process

For the interaction *School* × *Time* significant effects are observed for Scale 5, on *"Evaluating the development of the learning process (teacher perspective)"*. Effects were noticeable although not significant on Scale 1, *"Evaluating the design of the teaching-learning process (teachers)"* and on Scale 7, *"Evaluating the end product of teaching-learning (teachers)"*. These results can be observed in Table 3.

Table 3. MANOVA. Effects for the independent variable *School x Time* with regard to total scores from each of the teacher scales

	Time	Exp. School	Ctrl. School	Partial F	total F p<
		Mean *(sd)*	Mean *(sd)*	(Pillai trace)	(Pillai trace)
		N= 29	N= 20		
Scale 1: Total assessment of the design of the teaching/learning process	1	3.87*(.33)*	3.76*(.36)*	F(1,1,45)= 3.470$^{.06}$	F(4,4,42)= 1.650n.s.
	2	4.07*(.35)*	3.59*(.34)*		
Scale 3: Total of the scale for assessing development of the teaching process	1	3.66*(.52)*	3.54*(.41)*	F(1,1,45)= .927n.s.	
	2	3.97*(.44)*	3.61*(.40)*		
Scale 5: Total of the scale for assessing development of the learning process	1	2.45*(.36)*	3.03*(.56)*	F(1,1,45)= 3.861*	
	2	3.16*(.41)*	3.19*(.64)*		
Scale 7: Total assessment of the end product of teaching/learning	1	3.27*(.37)*	3.41*(.40)*	F(1,1,45)= 3.636$^{.06}$	
	2	3.88*(.56)*	3.49*(.59)*		

*p<.05 **p<.01 ***p<.001 ****p<.0001

Time 1= Pretest Time 2= Postest

2) Effect of the advisory program on the dimensions of the T/L process

The interaction *School* × *Time* had somewhat significant effects on Subscale 1B, addressing "*Planning the Teaching/Learning Process";* it pertains to the Design of the T/L Process on the part of the teacher. The effects on Subscale 5B, "*Strategies for learning and self-regulation",* were more consistent, referring to Developing the learning process. Therefore, the advisory program shows effects on teachers' perception of how they plan their teaching, and their view of how well the students have learned. Results are seen in Table 4.

Table 4. MANOVA. Effects seen for the independent variable *School x Time* with regard to subtotal scores for each of the subscales for teachers

	Time	Exp. School	Ctrl. School	Partial F (Pillai trace)	total F p< (Pillai trace)
		Mean *(sd)* N= 29	Mean *(sd)* N= 20		
Scale 1 Part A: Total, awareness of the Teaching/Learning process	1	3.90 *(.40)*	3.67*(.33)*	F(1,1,45)= 1.439 n.s.	F(9,9,37)= 1.187n.s.
	2	4.00*(.42)*	3.51*(.31)*		
Scale 1 Part B: Total, planning the Teaching/Learning process	1	3.79*(.69)*	3.01*(.72)*	F(1,1,45)= 3.471$^{.06}$	
	2	4.25*(.46)*	3.80*(.50)*		
Scale 3: Part A: Total, teacher's regulatory behavior	1	3.65*(.54)*	3.58*(.44)*	F(1,1,45)= 1.201 n.s.	
	2	3.98*(.47)*	3.60*(.42)*		
Scale 3: Part B: Total, evaluation strategies of teaching	1	3.86*(.44)*	3.43*(.60)*	F(1,1,45)= 1.163 n.s.	
	2	3.87*(.50)*	3.77*(.67)*		
Scale 3: Part C: Total , regulatory activities in the teaching process	1	3.53*(.72)*	3.50*(.60)*	F(1,1,45)= 1.404 n.s.	
	2	4.99*(.44)*	3.55*(.51)*		
Scale 5: Part A: Learning behavior and self-regulation in students	1	2.38*(.46)*	2.85*(.57)*	F(1,1,45)= 2.078 n.s.	
	2	3.18*(.56)*	3.16*(.77)*		
Scale 5: Part B: Learning strategies and self-regulation	1	2.47*(.39)*	3.09*(.57)*	F(1,1,45)= 4.039*	
	2	3.16*(.40)*	3.20*(.63)*		
Scale 7: Part A: Satisfaction with the teaching process	1	3.75*(.44)*	3.56*(.88)*	F(1,1,45)= 2.657 n.s.	
	2	4.36*(.45)*	3.58*(.69)*		
Scale 7: Part B: Satisfaction with the learning process	1	3.03*(.47)*	3.34*(.28)*	F(1,1,45)= 2.462 n.s.	
	2	4.64*(.68)*	3.45*(.70)*		

*p<.05 **p<.01 ***p<.001 ****p<.0001

Time 1= Pretest Time 2= Postest

3) Effect of the advisory program on specific T/L behaviors

The interaction *School* × *Time* on Scale 1 A, *Evaluating the design of the T/L process,* on item 27, "*When designing each instructional unit, topic or lesson, I plan out an explanation for the students about what teaching objectives I am pursuing",* shows a significant inter-

action. Two other items, number 13 "*The way the teacher teaches influences how the students learn*" and 28, "*When designing each instructional unit, topic or lesson, I plan to inform the students about how we will work on this topic*", have effects which approach significance. Results can be observed in Table 5 and Figure 2.

Table 5. MANOVA. Effects seen for the independent variable *School x Time* with respect to significant items from Scale 1 (teachers)

	Time	Exp. School Mean *(sd)* N= 29	Control School Mean *(sd)* N= 20	Partial F (Pillai trace)	total F p< (Pillai trace)
Scale 1, item 13: *The way the teacher teaches influences how the students learn*	1	4.47*(.71)*	4.30*(.82)*	F(1,1,45)= 3.303$^{.07}$	F(29,29,17)= .605 n.s.
	2	4.75*(.45)*	3.80*(.92)*		
Scale 1, item 27: *When designing each instructional unit, topic or lesson, I plan out an explanation for the students about what teaching objectives I am pursuing*	1	3.35*(1.12)*	3.70*(.95)*	F(1,1,45)= 4.428*	
	2	4.50*(.67)*	3.70*(.82)*		
Scale 1, item 28: *When designing each instructional unit, topic or lesson, I plan to inform the students about how we will work on this topic*	1	3.65*(1.17)*	4.10*(.74)*	F(1,1,45)= 3.453$^{.07}$	
	2	4.33*(.89)*	3.80*(.42)*		
*p<.05; **p<.01; ***p<.001; ****p<.0001					
Time 1= Pretest Time 2= Postest					

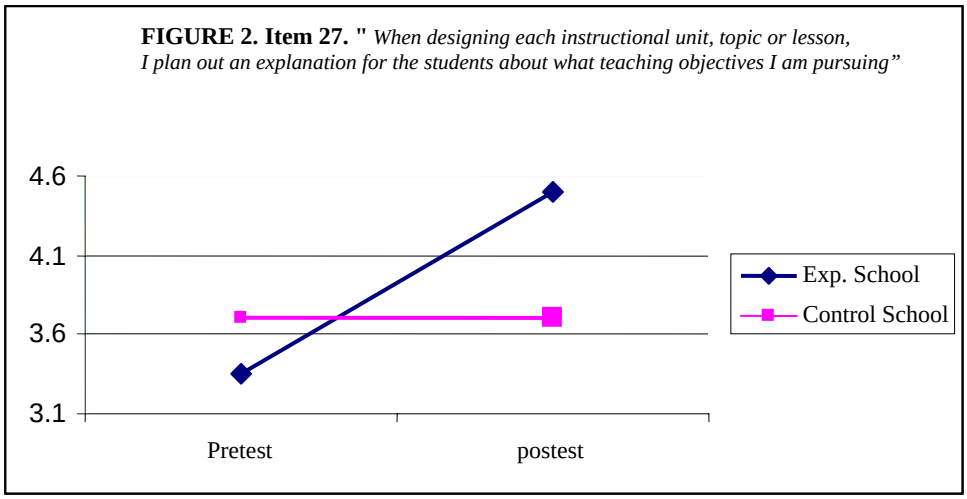

Figure 2.- Item 27

Student Results

1) Effect of the advisory program on the General T/L Process

Statistical effects which appear in students as a result of the intervention indicate significant differences in the interaction between both variables in the total on Scale 2, called "*Scale on the Design of the Learning Process*" and on Scale 6, "*Evaluating the end product of Teaching-Learning*". Results are reflected in Table 6.

Table. 6. MANOVA. Effects seen for the independent variable *School x Time* with regard to total scores on each of the student scales

	Time	Exp. School	Control School	Partial F (Pillai trace)	total F p<
		Mean *(sd)*	Mean *(sd)*		(Pillai trace)
		N= 645	N= 500		
Scale 2: Assessing the Design of the Learning Process	1	3.49*(.42)*	3.58*(.53)*	F(1,1,1141)= 30.438****	F(4,4,1138) = 9.009***
	2	3.50*(.52)*	3.25*(.57)*		
Scale 4: Assessing the Development of the Teaching Process	1	3.28*(.57)*	3.19*(.66)*	F(1,1,1141)= 1.978 n.s.	
	2	3.17*(.60)*	2.98*(.57)*		
Scale 6: Assessing the Development of the Learning Process	1	3.13*(.60)*	3.26*(.58)*	F(1,1,1141)= 15.252****	
	2	3.24*(.60)*	3.10*(.57)*		
Scale 8: Assessing the end product of the Teaching Process	1	3.63*(.67)*	3.43*(.80)*	F(1,1,1141)= 1.945 n.s.	
	2	3.60*(.76)*	3.27*(.86)*		
*p<.05; **p<.01; ***p<.001; ****p<.0001					
Time 1= Pretest; Time 2= Postest					

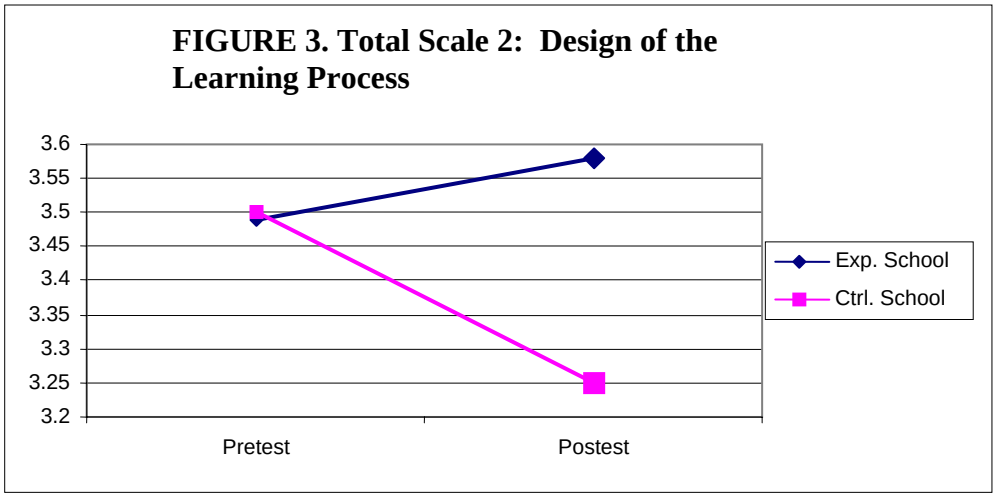

Figure 3.- Total Scale 2

2) Effect of the advisory program on dimensions of the Learning Process

A significant general effect for the interaction *School* × *Time* appeared on the set of IATLP Scales completed by the students, F(9,9,1133) = 5.135 (p<.0001). Significant effects also appeared on different dimensions. With regard to the time period of *Designing the Learning Process* (DEDEPRO Model), Subscale 2A, on "*Awareness of the Learning Process"* and Subscale 2B, on "*Planning the Learning Process*", significant improvements were shown.

Notwithstanding, the most significant results appeared at the time period of *Developing the Teaching and Learning Process* (DEDEPRO Model). Subscale 4B on "*Teaching Strategies for Evaluation"* showed improvement for the Teaching Process. For the Learning Process, Subscale 6A, on "*Self-regulated Learning Behavior in the Classroom*", and Subscale 6B, on "*Learning and Self-regulation Strategies"*, effects showing significant increase appeared for the experimental school.

Finally, with regard to the *Product of Teaching-Learning* (DEDEPRO), a significant increase effect appeared on Subscale 8B, on "*Satisfaction with my Learning Process"*. All the above results are reflected in table 7.

Table 7. MANOVA. Effects seen for the independent variable *School* × *Time* with regard to subtotal scores for each of the student scales

	Time	Exp. School	Control School	Partial F (Pillai trace)	F total p<
		Mean *(sd)*	Mean *(sd)*		(Pillai trace)
		N= 645	N= 500		
Scale 2: Part A: Awareness of the Teaching-Learning Process	1	3.51*(.44)*	3.63*(.54)*	F(1,1,1141)= 34.140****	F(9,9,1133)= 5.135****
	2	3.53*(.52)*	3.29*(.60)*		
Scale 2: Part B: Planning the Learning Process	1	3.44*(.74)*	3.39*(.83)*	F(1,1,1141)= 4.860*	
	2	3.35*(.81)*	3.07*(.85)*		
Scale 4: Part A: General Teacher Behavior	1	3.53*(.66)*	3.37*(.78)*	F(1,1,1141)= .332 n.s.	
	2	3.37*(.68)*	3.16*(.69)*		
Scale 4: Part B: Teaching Strategies for Evaluation	1	3.01*(.61)*	3.07*(.61)*	F(1,1,1141)= 4.530*	
	2	2.91*(.63)*	2.87*(.60)*		
Scale 4: Part C: Regulated Learning Activities	1	3.15*(.76)*	3.03*(.86)*	F(1,1,1141)= 1.901 n.s.	
	2	3.12*(.74)*	2.88*(.74)*		
Scale 6: Part A: Self-regulated Learning Behavior in the Classroom	1	2.99*(.64)*	3.18*(.68)*	F(1,1,1141)= 13.313****	
	2	3.12*(.67)*	3.03*(.66)*		
Scale 6: Part B: Learning and Self-regulation	1	3.17*(.64)*	3.29*(.59)*	F(1,1,1141)=	

strategies	2	3.28*(.61)*	3.13*(.60)*	13.593****	
Scale 8: Part A: Satisfaction with the teaching process as carried out (developed) by your teacher	1	3.84*(.90)*	3.54*(1.08)*	F(1,1,1141)= .189 n.s.	
	2	3.66*(.99)*	3.40*(1.07)*		
Scale 8: Part B: Satisfaction with my Learning Process	1	3.56*(.70)*	3.39*(.80)*	F(1,1,1141)= 3.759*	
	2	3.58*(.80)*	3.23*(.86)*		
*p<.05; **p<.01; ***p<.001; ****p<.0001					
Time 1= Pretest; Time 2= Postest					

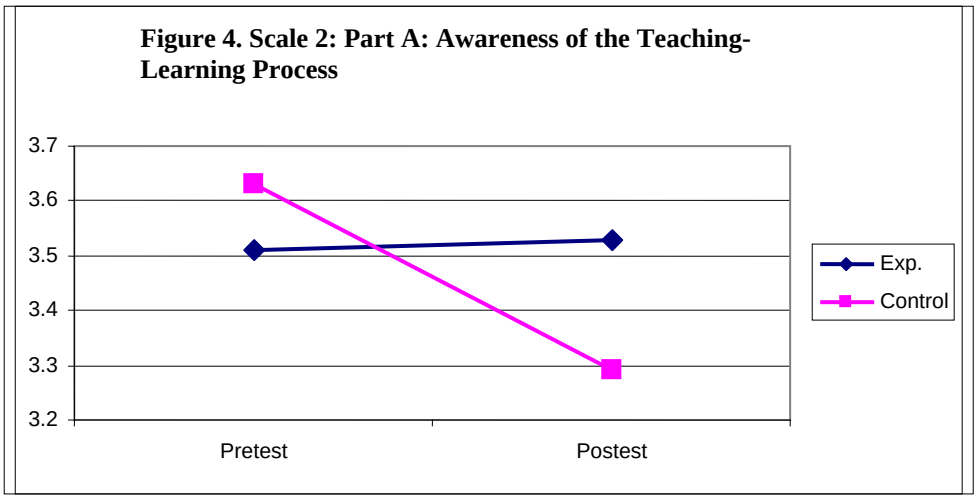

Figure 4.- Scale 2: Part A

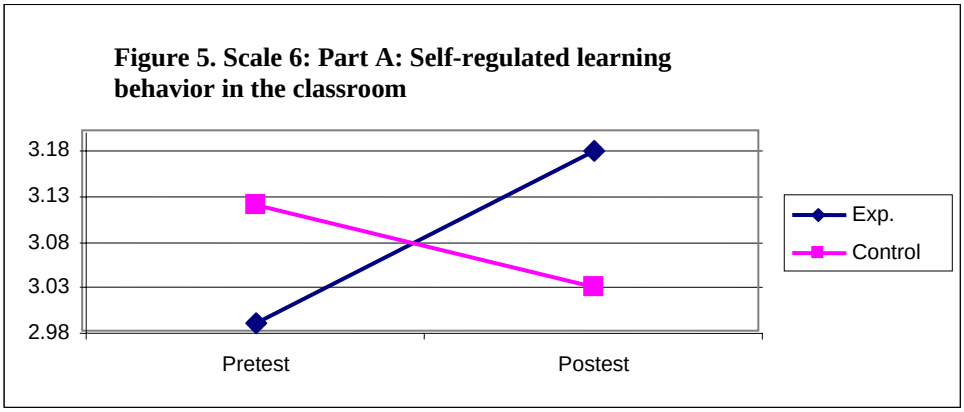

Figure 5.- Scale 6: Part A

3) Effect of the advisory program on specific T/L behaviors

The general effect of the interaction *School* × *Time*, F(22,22,1121 = 4.051; p<.0001), reveals the impact of the intervention. The interaction *School* × *Time* has significant results on item 1, "*Teaching is doing activities with the students to get them to learn the subject matter*", item 2, "*Teaching is helping the student to learn on his own*", item 3, "*Teaching is varying activities until you find what helps the students learn well*", item 4, "*Learning is knowing how to restate the subject matter that the teacher has explained*", item 5, "*Learning is getting adequate results on exams*", item 6, "*Learning is understanding what you study*", item 9, "*Learning is knowing what I have to do in order to carry out class activities*", item 10, "*Learning is knowing what I have to do when I am studying at home*", item 12, "*Grouping better students separately from poorer students encourages everyone's learning*", item 13, "*Helping each student know how to learn on his own encourages students' learning*" and item 20, "*When I'm about to study a lesson, I plan out how to understand the different types of subject material*". Results can be observed in Table 8 and in figures 6, 7, 8, 9 and 10.

Table 8. MANOVA. Effects seen for the independent variable *School* × *Time* with regard to scores for significant items on Scale 2 (students)

	Time	Exp. School	Control School	Partial F (Pillai trace)	Total F p< (Pillai trace)
		Mean *(sd)*	Mean *(sd)*		
		N= 645	N= 500		
item 1	1	3.42*(1.13)*	3.78*(1.18)*	F(1,1,1142)= 24.037****	F(22,22, 1121)= 4.051****
	2	3.82*(1.15)*	3.49*(1.26)*		
item 2	1	3.03*(1.25)*	3.06*(1.35)*	F(1,1,1142)= 5.648*	
	2	3.41*(1.22)*	3.09*(1.23)*		
item 3	1	3.12*(1.36)*	3.58*(1.21)*	F(1,1,1142)= 27.087****	
	2	3.54*(1.12)*	3.23*(1.26)*		
item 4	1	3.45*(1.22)*	3.56*(1.13)*	F(1,1,1142)= 15.387****	
	2	3.58*(1.14)*	3.13*(1.22)*		
item 5	1	3.48*(1.11)*	3.52*(1.22)*	F(1,1,1142)= 4.758*	
	2	3.43*(1.13)*	3.16*(1.24)*		
item 6	1	4.17*(1.04)*	4.19*(1.10)*	F(1,1,1142)= 24.333****	
	2	4.13*(1.01)*	3.50*(1.34)*		
item 9	1	3.39*(1.10)*	3.80*(1.07)*	F(1,1,1142)= 29.889****	
	2	3.63*(1.05)*	3.31*(1.21)*		
item 10	1	3.63*(1.12)*	3.77*(1.12)*	F(1,1,1142)= 19.048****	
	2	3.73*(.96)*	3.30*(1.26)*		
item 12	1	2.33*(1.42)*	2.91*(1.55)*	F(1,1,1142)= 3.731*	
	2	2.61*(1.48)*	2.84*(1.46)*		
item 13	1	3.77*(1.06)*	3.70*(1.16)*	F(1,1,1142)= 3.569*	
	2	3.66*(1.01)*	3.33*(1.24)*		
item 20	1	3.54*(1.11)*	3.48*(1.24)*	F(1,1,1142)= 6.133*	

	2	3.44*(1.01)*	3.04*(1.27)*		
*p<.05 **p<.01 ***p<.001 ****p<.0001					
Time 1= Pretest; Time 2= Postest					

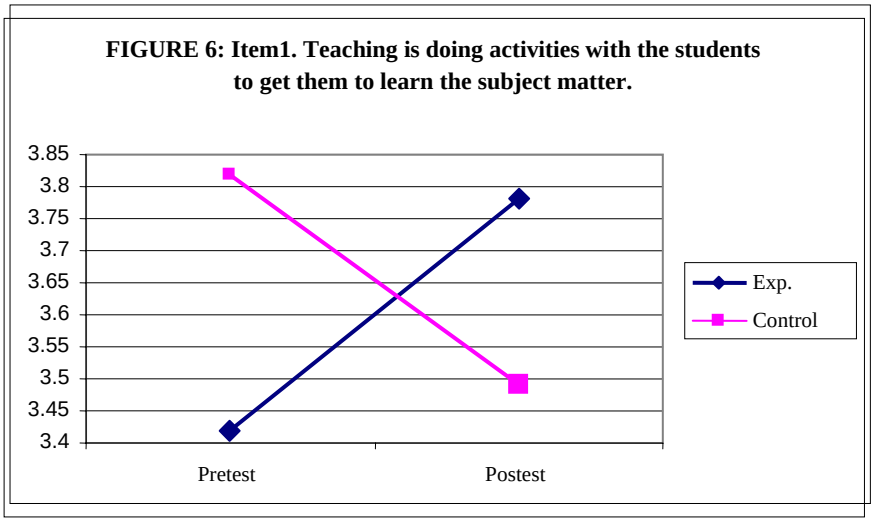

Figure 6.- Ítem 1

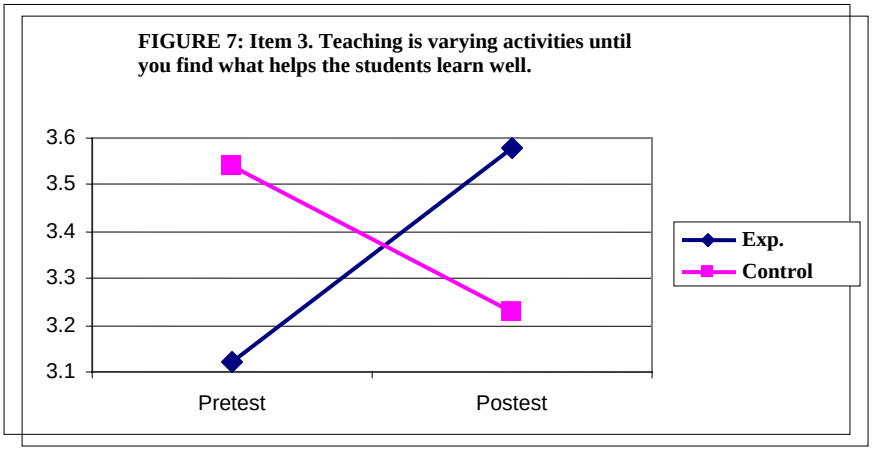

Figure 7.- Ítem 3

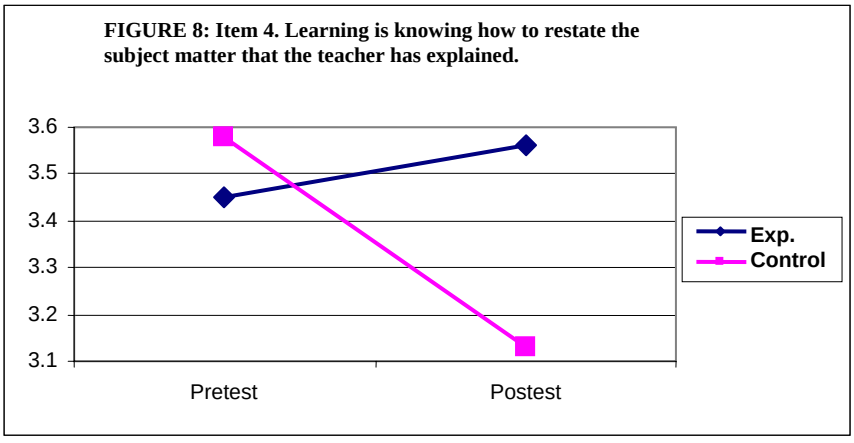

Figure 8.- Ítem 4

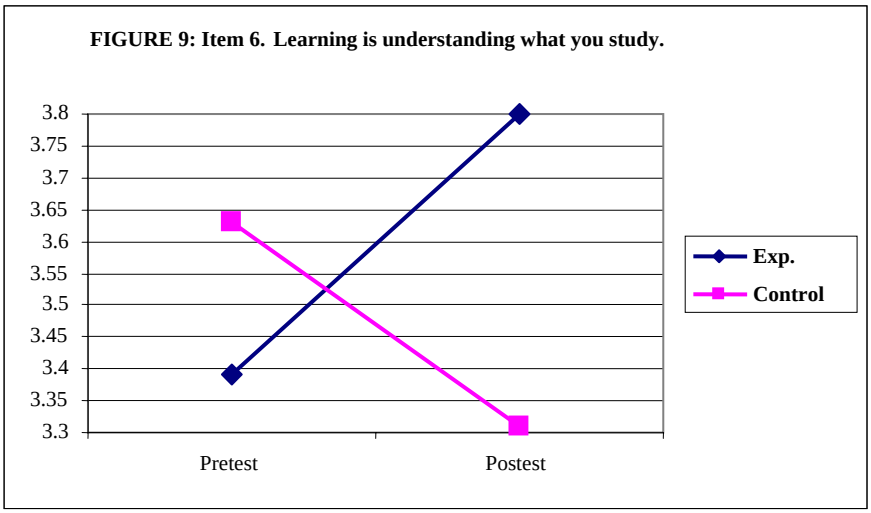

Figure 9.- Ítem 6

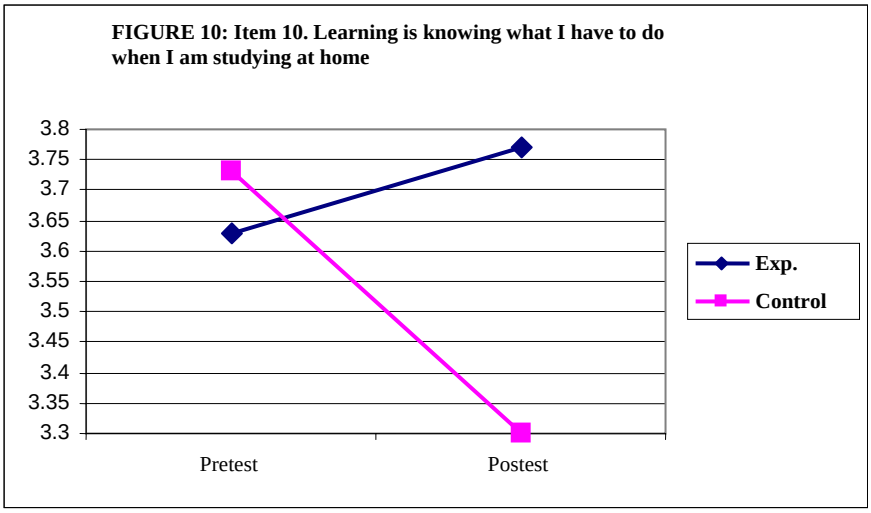

Figure 10.- Ítem 10

Discussion and conclusions

The fundamental objective of this study was to evaluate effects of an Advisory Program in Intervention for improving regulation of the Teaching-Learning Process, as conceived in the DEDEPRO™ model. This model assumes that teacher intervention can promote more self-regulated learning in students (*student-centered and learning-centered teaching).* Results from the inferential analyses showed that the effects of the *School* × *Time Interaction* are clearer and more evident when analyzing scales filled out by the students than those completed by the teachers. As expected, two different significant effects appeared.

Improving the design, development and end product of teaching

Effects of the intervention do not generally modify all the design, development and product of the teaching-learning process; rather, changes are aligned with improving specific behaviors which were worked on and agreed on by the faculty. In the case of *Designing the Teaching-Learning Process*, teachers from the experimental group significantly increased the design of certain regulating behaviors – for example, making explicit to the students the objectives and purposes being pursued with each topic of learning or didactic unit.

Improving the design, development and end product of learning

In general, the effect of the intervention was clearer and more significant in the students. In particular, with behaviors related to *design* (improved planning), to *development* (improved self-regulation and learning strategies) and in the *product* (greater satisfaction with learning). In the specific case of *Design of the Learning Process*, a significant increase of more accurate conceptions and better behaviors was produced in students from the experimental group, as presented in the Results section.

Regulating the teaching-learning process, advising and training the teaching staff

The training process used for the advisory intervention program for improving the Teaching-Learning Process at the experimental school can be considered satisfactory. As for the *advisory* part, it has been demonstrated that the DEDEPRO™ Model and the associated IATLP Scales (op. cit.), are suitable for assessing and improving the teaching-learning process in Secondary Education. As for the *training intervention* inherent in any advisory process, experience has shown that this methodology is fruitful in obtaining immediate changes in teacher behavior (regulated, student-centered teaching) and in students' learning (self-regulated learning). In summary, this paper reinforces the DEDEPRO model and implies a *practical application strategy* of the need for teacher training to develop a teaching style centered on promoting self-regulated learning in students (Chocarro, González-Torres & Sobrino, 2007).

At the same time, this advisory intervention has involved another step forward in teacher development. Notable involvement and sensitization on the teachers' part was a real-

ity. That part of these strategies can be implemented via the Pedagogical Technical Coordination Teams was also verified, affording cohesiveness to the teaching action as a body of teachers. For this purpose, the Pedagogical Technical Coordination Teams should promote ongoing teacher training in how to develop the basic competency "learning how to learn", by forming Work Groups in conjunction with the Teacher Development Center and with external consultants who are professional experts in the area.

Finally, designing this intervention as research and not as only an experience in educational innovation has contributed an added value, being genuine action research. Teachers were an active, knowing agent of the effects of their classroom intervention. Furthermore, this made it possible for the Guidance Department to introduce action-research to the teachers, through the perspective of *research + development + innovation (R&D&I)*, as a substantial way to improve the quality of education (De la Fuente et al., 2007; Sánchez, De la Fuente & Peralta, 2007).

Acknowledgments

This research was made possible thanks to the following subsidies:

1) De la Fuente, J., Justicia, F., Cano, F., Sander, P., Martínez, J.M. & Pichardo, M.C. (2003-2006). *Mejora de la autorregulación del aprendizaje, en estudiantes universitarios, a través de estrategias de enseñanza reguladoras on-line*. [Improving self-regulated learning in university students, through regulatory teaching strategies online.] *R&D&I Project* ref. BSO2003- 6493/PSCE. Madrid: Ministry of Science and Technology.

2) De la Fuente, J. (Dir.), Sánchez-Roda, M. D. & Peralta, F. J. (2005-2006). Proyecto Investigación de licencias por estudio "*Mejora de los procesos de enseñanza-aprendizaje, a través de procesos on-line, en el contexto de la orientación psicopedagógica"*. [Research Project of licenses by study, "*Improving teaching-learning processes through online processes in the context of school psychological guidance.*] Official Call, 28 March 2005, for licenses by studies for civil servants in teaching, under the Department of Education of the Andalusian Regional Government (BOJA no. 75, 19 April 2005). Approved under the Resolution of 3 August 2005. Department of Education, Andalusian Regional Government (Spain).

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