



What Works in Education?

Using Evidence to Improve Education

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Are social and emotional learning programs effective tools to improve students' skills?

Queralt Capsada

Using self-regulation and metacognition in class: what works and under what conditions?

Gerard Ferrer-Esteban

For too long, education has been based on inertia and tradition, and changes in educational intuitions or beliefs were unfounded. The “what works” movement enters into the world of education with a clear objective: to promote evidence-based educational policies and practices. Ivàlua and the Fundació Jaume Bofill join forces to promote the movement in Catalonia.”



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Social-emotional and metacognitive learning in schools: what works?

Miquel Àngel Alegre, co-author of *What Works in Education*

In the education sector, there is now the conviction that, alongside the “classic” cognitive skills related to curriculum areas such as mathematics and language, there are other vital skills which are of great importance for the personal development and social opportunities of children and youth in the 21st century: namely, on the one hand, the so-called social and emotional skills, and on the other, metacognitive and regulation skills.

Several definitions have been given for both these skills. For example, aspects of awareness and self-management, social awareness and interpersonal skills, or the ability to make responsible decisions would come under the category of social and emotional skills. Regarding metacognitive skills and self-regulation, it is customary to refer to learning to learn strategies and motivational elements, autonomy, planning and critical thinking.

Educational research has managed to demonstrate that both types of skills are closely related and, that a good command of both can promote learning in other areas of a more academic profile. At the same time, the importance of these skills in succeeding in increasingly complex social and work environments has been highlighted.

But only recently have begun to avail of robust evidence on the effectiveness of educational programs targeting these skills. This evidence comes mainly from English-speaking countries, where for some time they have been evaluating the impact of these programs on the same

working areas (personal and interpersonal skills, motivation, resilience, self-esteem, autonomy, self-regulation, etc.), but also on educational outcomes in languages, mathematics and science. This body of evidence is still “young” and little known here in Catalonia.

What does this evidence tell us? Do curricular innovations, tutorial initiatives, art projects, projects in values, management of emotions, conflicts and risky behaviours, self-learning, etc., succeed in improving the social and emotional and self-regulation skills of students? Which strategies work best and which are worse? Can these strategies also have positive outcomes on students' academic performance? What lessons can we draw from this accumulated knowledge to improve educational practice here at home?

These are the questions posed in the two reviews of the literature included in this 5th edition of *What works in education*. In the first article, Queralt Capsades Munsech (University of Glasgow) deals with the effectiveness of social and emotional learning programs; in the second, Gerard Ferrer-Esteban (Fundació Agnelli) looks at the efficacy of metacognition and the promotion of self-regulation.



What Works in Education?

Using Evidence to Improve Education

Are social and emotional learning programs effective tools to improve students' skills?



Queralt Capsada

PhD in Sociology at the University Pompeu Fabra. Postdoctoral Researcher at the Centre for Educational Change Robert Owen, University of Glasgow.

Motivation

We all probably know several people who, despite having a high IQ level, struggle to become successful in their academic, professional and personal lives due to a lack of self-esteem, self-management, persistence or motivation. On the other hand, we can also think of an example of a person who, with more modest cognitive abilities, has managed to fulfil many of their goals precisely thanks to a good dose of perseverance, discipline, motivation and self-confidence. It therefore seems clear that all these qualities, beyond strictly the IQ, can play a vital role in the course of our lives.

In the catchall that has become known as *non-cognitive skills*, the so-called social and emotional skills (self-awareness, self-management, social awareness, social skills and decision making ability) are those receiving the most attention in education. The main reason for this is

that these skills are closely related to the ideal of being a good student, citizen and worker, as well as reducing some of the unwanted risk behaviours such as school drop-out, bullying, violent behaviour and drug use. So, while for some learning and

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emphasizing such skills is seen as a way to change and shape a person's character, for others it is an opportunity to highlight skills that have so far been forgotten or have gone unappreciated despite their importance in terms of Integration within society, family, work and health.

Despite the growing number of interventions to develop learning these skills, assessments and systematic reviews of the effectiveness of programs that aim to develop them are far from being a majority. Countries such as the United States and the United Kingdom are leaders in the implementation, evaluation and review of the effectiveness of these programs in a systematic and scientific manner. It is for this reason that the present article contains information and evidence provided by these countries, which, although not directly transferable to our society, can serve as a guide in a wide range of cases.

What is social and emotional learning?

One of the most internationally accepted definitions of social and emotional learning (SEL) is used by the American organisation, Collaborative for Academic, Social, and Emotional Learning (CASEL) [1], a process through which people acquire and effectively apply the knowledge, attitudes, and skills necessary to:

- Understand and manage emotions.
- Set and achieve positive goals.
- Feel and show empathy for others.
- Establish and maintain positive social relationships with others.
- Make responsible decisions.

The aim of social and emotional education¹ is to improve students' academic success and social integration, to develop and improve social interactions among peers and to increase self-control of emotions. Social and emotional learning is based on the idea that learning improves

when it occurs in an environment of trusting and supportive relationships, which in turn facilitates learning that is meaningful, interesting and exciting.

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Many of the programs that focus on social and emotional learning do not concentrate exclusively on learning these skills, but do so within a broader framework that typically includes other skills of a cognitive or academic nature. The ultimate goal of these programs is to help students get to know themselves better and that this fact helps them to improve the way they work and live together with their peers, teachers, family and community.

¹ In this article, the terms *social and emotional learning* and *social and emotional education* are used as interchangeable synonyms.

Box 1.

Which are the social and emotional skills?

Traditionally, skills have been differentiated into cognitive and non-cognitive. While cognitive skills refer to the academic and intellectual level (thinking, reasoning, remembering knowledge) non-cognitive skills include those related to motivation, personal integrity and interpersonal interaction. One group of non-cognitive skills are those referred to as *social and emotional skills*, which are deemed necessary to be a good student, a productive member of society and a valued worker.

CASEL [1] identified five groups of interrelated skills which make up social and emotional competencies. These five groups are:

1. **Self-awareness:** The ability to accurately recognize one's own emotions, thoughts, and values and how they influence behaviour. This also includes the ability to accurately assess one's strengths and limitations, as well as establishing a well-grounded sense of confidence.
2. **Self-management:** The ability to regulate one's emotions, thoughts, and behaviours in different situations — effectively managing stress, controlling impulses, and motivating oneself. The ability to set and work toward personal and academic goals.
3. **Social awareness:** The ability to establish different background and cultural perspectives. To understand social and ethical norms of behaviour and to recognise family, school, and community resources and supports. This area refers to the capacity to empathize with others.
4. **Relationship skills:** The ability to establish and maintain healthy and rewarding relationships with diverse individuals and groups. The ability to communicate clearly, listen well, cooperate with others, resist inappropriate social pressure, negotiate conflict constructively, and seek and offer help, when needed, are all clear examples of these skills.
5. **Responsible decision-making:** The ability to make constructive choices about personal behaviours and social interactions, in accordance with social and ethical norms and considering the well-being of oneself and others.

All the above are social and emotional skills. While self-awareness and self-regulation refer to intrapersonal skills, the competencies of social awareness and relationship skills are of an interpersonal nature. The capacity of decision-making is considered an individual skill as well as a social process.

The social and emotional learning programs under review

This article focuses on a review of the evidence from programs for children and youth which set out to improve, at least one of, the social and emotional skills. The following are the three main types of programs within the social-emotional learning (SEL) programs targeting these groups:

1. **Universal school-based programs:** tend to focus on conflict resolution, empathy, positive social relationships and commitment arising from classroom activities. They apply to all members of the group and often include a crossover, in conjunction with working on other skills and knowledge. They are more of a preventative nature (prevent future behaviours and unwanted results) than corrective.
2. **Indicated school-based programs:** programs targeting students with skills deficit, behavioural problems or academic achievement. Often used as a corrective measure, although in some cases are directed at students at risk of developing these shortcomings or unwanted behaviours. They tend to be implemented within the school.
3. **After-school programs:** activities focused on developing social and emotional skills while developing extracurricular activities such as sports or arts. These cannot be considered universal programs because they take place outside school hours, and participation is voluntary, although in many cases they are aimed at students with existing problems or at risk of developing them.

The review of the evidence follows the distinction between these types of programs because they show significant differences in terms of the number of programs implemented, the target audience, the place where they are implemented and the activity with which they are combined beyond working on social and emotional skills.

Questions influencing the review

The empirical evidence shows how the fact of enjoying a set of social and emotional skills is very closely associated with several outcomes considered to be positive and desirable in our lives, such as good bill of health, social, educational and employment well-being [2]. Moreover, the fact that one enjoys these skills is related with lower levels of unwanted behaviours and associated social problems [3].

The aim of this review of the evidence is to discover to what degree social and emotional learning programs are capable of producing improvements in both the social and emotional dimension of the student as well as in their academic outcomes. The main questions influencing the review of the evidence are:

- What are the effects of social and emotional learning programs on these skills?
- What impact do social and emotional learning programs have on other academic and non-cognitive outcomes?
- Is there a type of program that shows better outcomes?

- Is there any group which benefits more than others from these types of programs?
- How long will the results of the program last?
- Are some forms of implementation more effective than others?

Reviewing the evidence

Every day there are more social and emotional learning programs being put into practice in different countries. However, not all are monitored and evaluated to check their impact and degree of influence on students. So far, most of the reviews and evaluations of such programs have been conducted in the United States and the United Kingdom. It is for this reason that this article focuses on the evidence provided by four meta-analytic reviews carried out by academics, plus three systematic reviews of the literature performed by educational institutions dedicated to the evaluation of the effectiveness of educational policies. The following table lists the main characteristics of the reviews.

So far, most of the reviews and evaluations of such programs have been conducted in the United States and the United Kingdom.



Table 1.
Studies included in the review of reviews, per main characteristics

Authors	Type of review	Type of programs reviewed	Number of studies/ programs	Selection criteria	Ages/ Grades	Control group
Durlak <i>et al.</i> (2007)	Meta-analysis	After-school	73 programs	Active during part of the school year After-school Supervised by adults	5-15 years old	Yes
Payton <i>et al.</i> (2008)	Meta-analysis	Universal, indicated & after-school	180 universals 80 indicated 57 after- school	Published in English Up to December 2007	5-13 years old	Yes
Durlak <i>et al.</i> (2010)	Meta-analysis	After-school	69 programs	Active during part of the school year After-school Supervised by adults	5-15 years old	Yes
Durlak (2011)	Meta-analysis	Universal	213 programs	In English Published or unpublished up to December 2007	5-15 years old	Yes
CASEL, 2013	Systematic review	Universal	52 programs	Included the 5 social and emotional competencies SAFE* implementation Long-term (1-2 years) painstaking implementation	Kindergarten to Primary	Yes, pre-and post-evaluation
CASEL, 2015	Systematic review	Universal	11 programs	Included the 5 social and emotional competencies SAFE* implementation Long-term (1-2 years) painstaking implementation	Secondary level programs	Yes, pre-and post-evaluation
Clarke <i>et al.</i> (2015)	Systematic review	Universal & after-school	39 universal 55 after-school	Evaluated in the UK Results published between 2004 and 2014	4-25 years old	Yes, for universal programs. No, for extracurricular (pre-and post-evaluation)

*SAFE: *Sequenced, Active, Focused and Explicit*. These standards have been explained in the sections below.
Source: Prepared by the authors.

Since some studies provide evidence on the three types of programs considered social and emotional learning (universal, indicated, after-school) and others only on a particular type, the results of the review have been divided into three groups depending on the types of programs evaluated. This grouping enables us to highlight the similarities and differences between the three types of social and emotional learning programs.

Box 2.

How do we measure social and emotional competencies?

Despite the difficulty of measuring social and emotional skills in a systematic way and as objectively as possible, there are a number of methods widely used in the evaluation of social and emotional learning programs. The programs considered in the review of the reviews include some of the following methods to measure these skills before and after intervention:

- **Rating scales:** series of descriptions of personal and behavioural characteristics. Students are classified on a rating scale (generally from 1-4) depending on whether that being rated identifies the student as being “little”, “not much”, “quite” or “very”. The questionnaire is normally filled out by the student, parents and teaching staff independently in order to triangulate data.
- **Checklist:** series of questions concerning students’ activities and behaviour. Students are usually classified on a 3-point scale (“Always”, “Sometimes”, “Not at all”) depending on whether the activity or behaviour described is developed. The list is normally filled out by the student, parents and teaching staff independently in order to triangulate data.
- **Observation:** report completed by teaching staff and/or parents about the students’ behaviour prior to and post intervention. This is often used for specific programs which aim to address specific behavioural problems or risk behaviours.
- **Self-reporting:** series of questions about behaviour, self-management of emotions, problem-solving, etc., answered by the students before and after the intervention to see how it has affected their behaviour and learning. It is often used for specific programs designed to address specific behavioural problems or risk behaviours.

For more information, please see the publication by the Raikes Foundation, which presents a systematic collection of the different methods for measuring social and emotional skills [4].

School-based universal programs

School-based social-emotional learning programs came about mainly as a response to growing evidence provided by clinical studies and prevention programs for young people which suggested that the fact of having and developing social-emotional skills improved their academic success and well-being [5] [6].

Based on this growing body of evidence, the number of such programs within the school setting is on the increase. For this reason, this group accounts for the majority of social-emotional education programs, both implemented and evaluated. The most complete and up to date meta-analysis of such programs is Durlak *et al.* 2011 [7], although Payton’s study also includes these programs in its review [8]. The attention of educational institutions focusing on the review of policies that work has

mainly centred on the review of such universal social-emotional learning programs [1] [3] [9].

The meta-analysis study carried out by Durlak *et al.* (2011) includes the impact of the programs on social and emotional skills, but also on other academic results and behaviours. The study includes 213 programs, most of which have published the evaluation results during the last twenty years (75%). 47% of the studies included used some method of randomization of the students taking part in the program and those not taking part, so the differences between the treatment and control group can be attributed exclusively to the program. More than half of the programs targeted primary school students (56%), 31% focused on lower secondary level and the remainder on upper secondary level. Less than half were carried out in urban areas (47%). Most programs are developed exclusively in the classroom and were delivered by teachers from the centre (53%) non-centre (21%) or a combination of both (26%). The vast majority of programs had a duration less than one year (77%), 11% were between one and two years and 12% over two years.

Box 3.

***I Can Problem Solve*, a school-based universal program**

The main objective of the *I Can Problem Solve* social-emotional learning program implemented in schools in the United States is to teach students to develop alternative solutions and anticipate unintended consequences, as well as effectively solving problems they will encounter throughout life. The program is divided into three distinct groups of classes for students in pre-school, primary and secondary grades and classes are scheduled for periods of 20 minutes. Throughout the session, key social and emotional concepts and skills are introduced and then instruction is provided on how to put that concept into practice, presenting possible real situations that pose problems. The student must then make a decision on how to deal with the issue, bearing in mind the key concepts relating to the necessary social and emotional skills to self-manage their emotions in such a way as to respect other members of the group. Therefore, the principal approach of the session is dialogue between teacher and student. Teachers have the resources to apply this methodology beyond these targeted sessions and thus reinforce interaction with students. Similarly, parents can avail of materials which place the emphasis on the concepts and techniques covered in class, suggesting strategies to implement problem-solving in academic subjects. Normally, teachers are offered a two-day training model on how to apply and develop the program, and have a customised follow-up consultation support system for answering questions and improving program implementation.

More information [1] and <http://www.icanproblemsolve.info/>

The mean impact of all programs on the result set is considered to be 0.30², showing a certain heterogeneity in the results for each program depending on the features referred to below (Table 2). Overall, it was observed that the most significant improvement is in social and emotional (SEL) skills, but also that there is an effective impact in terms of positive attitudes, reducing risk behaviour and academic outcomes. On the other hand, if the programs differ according to whether they have been implemented by teachers from the same education centre, non-school personnel or by a combination of both, the results vary. When the activity is delivered by teachers from the same centre, all skills considered improve on average, while in the case of non-school personnel, the magnitude of the effect is greater with respect to improving the social-emotional skills, but the outcomes are less substantial in the area of behaviour, emotional distress and academic outcomes.

Table 2.

Mean differences in program effectiveness according to who delivers activity

	Class by teacher			Class by non-school personnel			Combination of personnel		
	Effect size ¹	CI (95 %)	N	Effect size ¹	CI (95 %)	N	Effect size ¹	CI (95 %)	N
Social-emotional skills	0.62*	[0.41-0.82]	40	0.87*	[0.58-1.16]	21	0.12	[-0.35-0.60]	7
Attitudes to oneself and others	0.23*	[0.17-0.29]	59	0.14*	[0.02-0.25]	18	0.23*	[0.15-0.31]	26
Positive social behaviour	0.26*	[0.15-0.38]	59	0.23	[-0.04-0.50]	11	0.19	[-0.02-0.39]	16
Conduct problems	0.20*	[0.12-0.29]	53	0.17*	[0.02-0.33]	16	0.26*	[0.17-0.34]	43
Emotional distress	0.25*	[0.08-0.43]	20	0.21	[-0.01-0.43]	14	0.27*	[0.07-0.47]	15
Academic performance	0.34*	[0.16-0.52]	10	0.12	[-0.19-0.43]	3	0.26*	[0.16-0.36]	22

¹ Standardized effect value is given, in accordance with Cohen's effect size measure. In this way, the measure of impact must be compared between programs. Based on Cohen's indications, the following is generally true: values similar to or less than 0.2 indicate a small effect size; values similar to 0.5, a medium effect size; values in the region of or greater than 0.8, a large effect size.

* Denotes mean effect is significantly different from zero at the 0.05 level
Source: Durlak *et al.* (2011).

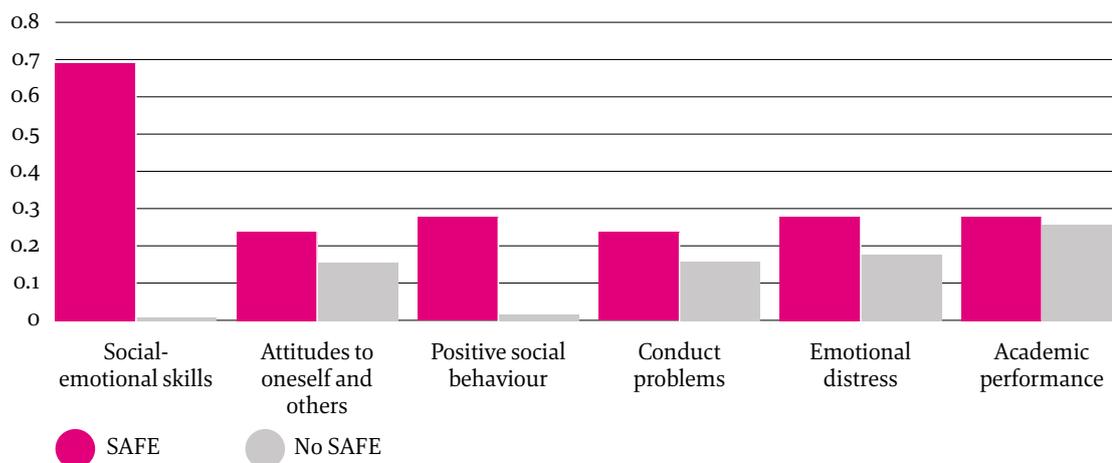
Another of the main differences in the impact of the programs is based on whether there have been complications during implementation and depending on whether teachers have followed SAFE guidelines for implementation, which consist of the four points listed below:

- **Sequenced:** the program uses a set of coordinated and connected activities to achieve their specific objectives.
- **Active:** the program uses active forms of learning to help youth improve skills or learn new skills.
- **Focused:** the program has at least one component devoted to developing personal or social skills.
- **Explicit:** the program has clear objectives that it aims to achieve in specific social-emotional competencies. This assists youth in knowing what is expected of them.

² This value references the standardized mean difference between outcomes from the treatment and control groups in other words, the standardized effect size (Cohen's d). Results are calculated so that positive outcomes are favourable to the treatment group.

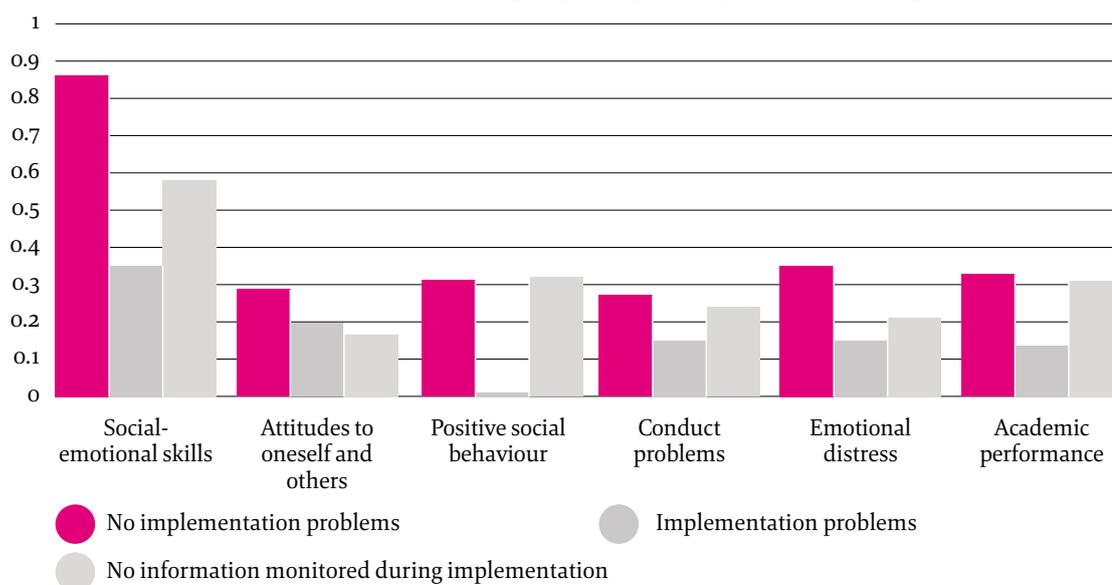
As shown in graphs 1 and 2, programs which were implemented using SAFE guidelines are much more successful in all respects compared with those which do not follow the SAFE practices. Similarly, it is not surprising that programs which experienced implementation problems present worse outcomes than those which did not have problems, although a significant portion of the sample considered do not provide information regarding monitoring throughout implementation.

Graph 1.
Differences in program effect size with and without SAFE implementation



Source: Prepared by authors, based on Durlak *et al.* (2011).

Graph 2.
Differences in effect measurement of program per implementation problems



Source: Prepared by authors, based on Durlak *et al.* (2011).

Reports from educational institutions which include different educational levels of universal programs do not contradict the results just obtained from the meta-analysis. In fact, the CASEL reports are more a collection of good practices rather than a systematic analysis of what works and what does not. Nevertheless, they represent a valuable collection of experiences and examples as shown in [Table 3](#).

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Indicated school-based programs

Although most social and emotional education programs are designed to address the needs of the whole group of children and young people, there are programs targeted exclusively at the needs of students who show signs of social, emotional, behaviour or learning problems. The aim of such programs is to prevent these problems increasing and to avoid greater evils, both as regards health and welfare of students and their peers. A further argument in support of this type of intervention is focused on specific groups that may result in cost-saving for society in the future in terms of social and medical services.

Although there are fewer indicated program experiences that universal ones, they do not constitute a homogeneous group. Interventions refer to very varied topics and address aspects of behaviour that may range from aggression and bullying to serious emotional disorders such as anxiety or depression.

Indicated school-based programs addressed both behavioural issues, which can include aggression or bullying, to serious emotional disorders such as anxiety and depression.



The only systematic review of these types of indicated programs performed to date is included in the 2008 CASEL publication [8], developed by Payton and his colleagues at the University of Illinois. The review includes 80 programs, most of which are subsequent to 1990 (56%) and the results of the evaluations have been published in academic journals or books. Most of the students participating in these programs showed behavioural problems (38%), emotional distress (23%) or problems with peer relationships (10%). In other programs (29%), participants showed more than one problem at a time, such as depression and relationship problems in the same child. Most programs took place in elementary education (69%) and half of the programs were carried out in urban areas. In terms of methodology, we can say that most of the programs included in the review were of extremely high quality, since the majority (80%), used experimental design with participants being randomly to groups.

Box 4.

***Making Choices*, a school-based indicated program**

The Making Choices program is aimed at students identified as presenting at risk behaviours and is designed to work with participants in resolving conflicts and other problems that may arise as a result of peer relationships. The program consists of 30 sessions in which students, through explanatory meetings and case studies are encouraged to recognize their emotions (self-awareness) and to regulate the response to these emotions if they involve physical or verbal aggression (self-management). Students are presented with alternatives regarding how to react when they feel these emotions (e.g., anger) and to react through self-awareness and self-management, avoiding violent backlashes and promoting healthy relationships with peers to build and maintain friendships.

More information [\[10\]](#).

Regarding implementation, in most cases school personnel identified children for participation in the program, while a minority are cases where students self-identified to participate in the program in question, or were identified by a peer. More than half of the programs (59%) consisted of a single intervention component, such as small-group problem-solving, showing students how to become aware of their own feelings and those of others, to learn strategies to cope with anxiety such as generating alternative solutions. The remaining programs (41%) included more multiple intervention components, such as supervised one-to-one and group sessions. Some of the programs (23%) also included the participation of the parents to instruct them in how to reinforce what their children were learning at school. More than half of the programs used non-school personnel to deliver the intervention, while 21% used school personnel with the rest using a combination of both school and non-school staff. Most programs lasted less than six months.

In relation to the results, in all cases the members of the treatment group showed substantial improvements compared to the control group students. However, the magnitude of the effect varies with the type of outcome, as presented in [Table 3](#). An average improvement of 0.38 was detected in attitude towards one's self, the school and peers, while the effects are greater in the rest of the outcomes, especially in the gains social and emotional competencies, with an average of 0.77. It should be noted, however, that the magnitude of these effects decreases as time passes (most controls are monitored for six months at most). Despite this decline, the improvement is still higher than among those who have not participated in the program. The only exception is in reference to academic outcomes, which are still significantly better for those who took part in the program compared to those who did not.

Table 3. Outcomes obtained by students after taking part in the program in relation to the control group

	After intervention			Follow-up		
	Effect size ¹	CI (95 %)	N	Effect size ¹	CI (95 %)	N
Social-emotional skills	0.77*	0.46-1.07	11	0.46*	0.12-0.79	6 [‡]
Attitudes to oneself and others	0.38*	0.19-0.56	29	0.30*	0.07-0.54	11
Positive social behaviour	0.50*	0.34-0.66	38	0.42*	0.17-0.66	11
Conduct problems	0.47*	0.34-0.60	53	0.30*	0.14-0.47	21
Emotional distress	0.50*	0.34-0.67	35	0.58*	0.37-0.80	13
Resultats acadèmics	0.43*	0.17-0.69	12	0.67	0.40-1.74	1 [‡]

¹ Standardized effect value is given, in accordance with Cohen's effect size measure. In this way, the measure of impact must be compared between programs. Based on Cohen's indications, the following is generally true: values similar to or less than 0.2 indicate a small effect size; values similar to 0.5, a medium effect size; values in the region of or greater than 0.8, a large effect size.

* Denotes mean effect is significantly different from zero at the 0.05 level

[‡] Denotes a reduced sample of studies and precaution should be exercised in its interpretation.

Source: Payton *et al.* (2008).

If we compare the mean results for the type of problem of participating students (Table 4), it seems that the effect is greater when students with different problems come together in the same program (0.92) than when the participating students have the same problem (the rest of cases).

Finally, just as with universal school-based programs, the evidence provided by the various assessments show that the impact of the program is more meaningful if carried out by teachers as opposed to non-school personnel.

Table 4. Outcomes obtained by students after participating in the program per type of problem student presents and the person delivering the program

	Outcomes of the effects of program		
	Effect size ¹	CI (95 %)	N
Type of problem students have			
Behavioural problems	0.44*	[0.29-0.58]	30
Emotional distress	0.54*	[0.33-0.76]	18
Problems in relationships with peers	0.89*	[0.53-1.26]	8 [‡]
Each student presents a different problem	0.92*	[0.36-1.47]	3 [‡]
Students with more than one problem	0.42*	[0.24-0.60]	21
Person who delivers program			
By teacher	0.54*	[0.41-0.69]	40
By non-school personnel	0.59	[0.49-0.79]	17
Combination of school and non-school personnel	0.26*	[0.07-0.46]	16

¹ Standardized effect value is given, in accordance with Cohen's effect size measure. In this way, the measure of impact must be compared between programs. Based on Cohen's indications, the following is generally true: values similar to or less than 0.2 indicate a small effect size; values similar to 0.5, a medium effect size; values in the region of or greater than 0.8, a large effect size.

* Denotes mean effect is significantly different from zero at the 0.05 level.

[‡] Denotes that it is a small sample of studies and suggests caution in its interpretation.

Source: Payton *et al.* (2008).

After-school programs

One of the concerns of families and institutions is what children and youth do outside school hours, because several hours without adult supervision can facilitate the development of risk behaviours which could have adverse effects on their academic and personal development. It is for this reason that participation in extracurricular activities tends to be seen as a positive activity. Some of these voluntary participation activities combine artistic or sporting activity outside school hours with activities explicitly aimed at improving social and emotional skills.³

Box 5.

Wisconsin 4-H, an after-school program

The Wisconsin 4-H Youth Development after-school program involves activities organized in projects which young people can join voluntarily. Each activity deals with a different theme, such as theatre. Young people participate in different projects around the theatre (clown workshop, putting on a play, juggling, etc.). The project promotes creativity and decision-making by students as well as teamwork, joint problem-solving and how to communicate effectively. Having an adult directing the activities and promoting these social and emotional learning skills reinforces the lessons learned during school hours.

More information [8] and <http://www.uwex.edu/ces/4h/evaluation/wireresults.cfm>

Although the practice of such activities is on the increase, there are still few evaluations which have rigorously measured their impact on participants' social and emotional learning (and academic). To date, there is only one meta-analysis that has gathered and analysed evidence for after-school social and emotional learning (SEL) programs [11].⁴

One of the concerns of families and institutions is what children and youth do outside school hours, because several hours without adult supervision can facilitate the development of risk behaviours.



As was the case with school-based universal and indicated programs, after-school programs also demonstrate positive effects on social-emotional skills, behaviour and even academic outcomes. As shown in [Table 5](#), the majority of the competencies studied experienced a statistically significant improvement when compared with average values for the treatment group before and after taking part in the program. The most noticeable changes can be observed in the improvement of the child or youth's self-perceptions, an increase in positive social behaviours and a reduction

3 For a general review of the impact of extracurricular programs and activities on performance and non-cognitive competencies of children and youth, please see the article by Sheila González in the fourth edition of the publication *What works in education*.

4 Two previous reports also reviewed this kind of program exclusively [12] or in combination with other types of programs [8], which are included in the meta-analysis presented here. On the other hand, we have not considered the outcomes from a recent report published in the UK by Clarke *et al.* (2015) in this section, as it is a review which includes studies that are not based on experimental or quasi-experimental methodologies.

in the average values for behaviour problems (violence, aggression, etc.). The only exceptions are in drug use and school attendance, where participation in some after-school programs do not result in an on average increased or decreased values.

However, the main outcome to be highlighted is that the improvements in the social-emotional skills are only significant when the program adheres to SAFE guidelines. It seems therefore, that just as in the case of universal programs, after-school programs require a well-sequenced, active, focused and explicit social-emotional learning (SEL) project in order to achieve relevant impacts.

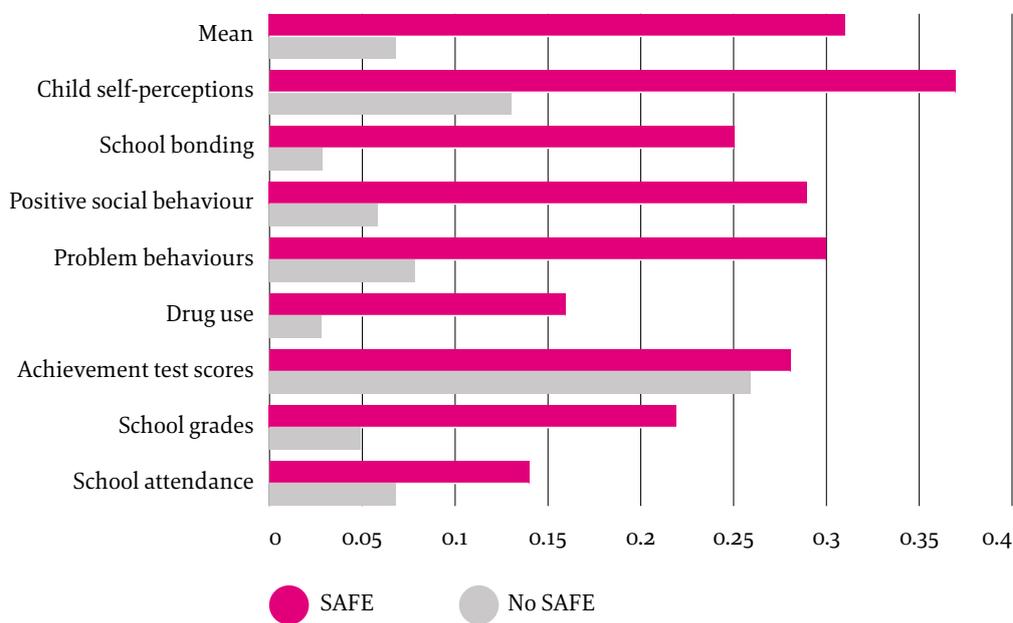
Table 5.
Mean effects of 68 studies after intervention in comparison with before

	Outcomes of the effects of program		
	Effect size ¹	IC (95 %)	N
Feelings and attitudes			
Child self-perceptions	0.34*	[0.23-0.46]	23
School bonding	0.14*	[0.03-0.25]	28
Indicators of behavioural adjustment			
Positive social behaviour	0.19*	[0.10-0.29]	36
Problem behaviours	0.19*	[0.10-0.27]	43
Drug use	0.10	[0.00-0.20]	28
School performance			
Achievement test scores	0.17*	[0.06-0.29]	20
School grades	0.12*	[0.01-0.23]	25
School attendance	0.10	[-0.01-0.20]	21

Denotes mean effect is significantly different from zero at the 0.05 level
Source: Durlak *et al.* (2010).

Graph 3 depicts the magnitude of the differences between outcomes from the different programs which were implemented following SAFE and non-SAFE practices. The graph clearly shows that the effectiveness of after-school programs using SAFE guidelines for social and emotional skills is far greater than those which do not.

Graph 3.
Differences in the effect measurement¹ per type of implementation (SAFE)



¹ All SAFE outcomes present a standardized mean difference (Cohen's conventions) is statistically different from zero at the 0.05 level; in all categories and groups a sufficient number of studies are available to perform a comparison. Source: Prepared by authors, based on Durlak *et al.* (2010).

Summary

The evidence provided and reviewed to date consistently shows that, beyond the potential baseline differences in social-emotional skills levels between individuals, these can be learned and developed both within the school framework as well as outside, in combination with other activities. In an effort to answer the questions which have influenced this review of reviews, we can say that:

- **What impact do social and emotional learning (SEL) programs have on these skills?** In general, the programs reviewed improved social and emotional skills. Although some of the evaluated programs showed no significant differences between program participants and the control group, in no case did participants in the program show deterioration in their social and emotional skills.
- **What impact do social and emotional learning programs have on other academic and non-cognitive outcomes?** The majority of the programs assessed, which consider skills other than the social-emotional have shown positive outcomes in both reducing risk behaviours and increased academic outcomes. In no case, did the evidence show that participation in the program impaired academic outcomes or increased risk behaviours.
- **Is there any program that shows the best results?** In general terms, based on the information available and bearing in mind the difference in the number of programs of each type evaluated, it seems that indicated

Indicated school-based programs as a whole produce better outcomes which exceed those obtained from universal or after-school programs.



programs are those which present better results as a whole, since all the programs demonstrate improvements in social and emotional learning. After-school universal programs do not always show statistically significant results.

- **Do any specific group of participants benefit more than others from these kinds of programs?** While not all programs include information on group composition, it seems that school-based universal programs present undifferentiated positive outcomes. In the case of school-based indicated programs, participants in activities that include students with different problems seem to achieve better outcomes than those grouped into homogeneous classes regarding the issue that affect them.
- **How long will the effects of the program last?** Not all programs offer participants a post-intervention monitoring system once the program has terminated. However, outcomes obtained from the programs which measure the effect of the program post-intervention as well as several months later would suggest that the effects decrease with the passage of time, especially within the academic setting
- **Are some forms of implementation more effective than others?** One of the most consistent outcomes among the different studies and types of programs is that social and emotional learning (SEL) programs are more effective if they are implemented following SAFE practices, which involve sequential development activities through which the student actively participates in tasks that focus on developing specific skills in one or more areas and when the objectives of the program or activity are explicit and clear.

Although the evidence gathered to date shows a clear support for the development and implementation of social and emotional learning (SEL) programs, one must bear in mind certain limitations. [Table 6](#) summarizes the main points in favour of developing and implementing social and emotional programs, as well as the principal limitations detected so far.

Table 6. Arguments for and constraints on social and emotional learning programs

For	Against
<ul style="list-style-type: none"> • Most programs show positive outcomes in social and emotional skills, and in no case were there negative results. • In most cases, social-emotional learning also reduces risk behaviours and improves academic performance; there are no examples of deterioration. • Improvements can be observed in social-emotional skill and other outcomes (behaviour, academic outcomes) for all age groups. • There is a type of implementation (SAFE) which has been shown to be more effective and efficient than the rest. 	<ul style="list-style-type: none"> • The evidence reviewed to date is in English and comes from programs implemented in the United States and the United Kingdom. • Most of the assessed programs included in the meta-analysis come from academic journals, in which there is usually a selection bias towards publication of statistically significant results. • Most reviews are from the same group of researchers and promoted mainly by one organisation (CASEL). • The different impact of programs depending on composition of student body (ethnicity, socioeconomic status, etc.) is not taken into consideration. • We cannot be sure of the duration of the effects of programs over time. • We cannot discern which specific intervention improves each specific outcome. • We do not know whether participation in more than one program at the same time is positive. • The way to measure social-emotional skills varies from one program to another. We cannot be sure if the results would be the same if all programs used the same methodology.

Implications for practise

The significant number of social and emotional education programs and the positive (or neutral) outcomes all confirm the success of such programs and the need to incorporate learning and improve such skills both within and outside the school setting. The improvement in social and emotional skills of children and youth seems to be positive in groups of different ages. Similarly, the provision made by both non-school as well as school personnel seems to show the possibility of including this type of learning within the standard school curriculum or transversely in different subjects.

Nevertheless, the diversity of programs also shows that there are different forms and levels of effectiveness when it comes to implementation. Although there is no evidence that any of these programs has been counterproductive to the learning of children and youth; quite the contrary, it does seem clear that we must ensure that programs are designed and implemented in the most efficient manner and with the greatest possible positive impact:

- **Duration of programs:** Most programs have a short duration. While the improvement of social-emotional skills is positive in all programs immediately after implementation, some programs which have performed monitoring several months later showed a decrease in the

It seems clear that these social-emotional programs require continuity to ensure that skills are not lost or deteriorate.



positive effect. It seems clear, therefore, that these programs require continuity to ensure that skills are not lost or deteriorate, in the same way as with other basic cognitive skills such as reading or numeracy.

- **Monitoring:** in line with the previous point, not only should social and emotional education be continued over time, but also its monitoring and evaluation. Although the evidence shows that its effectiveness decreases over time, there may be other contextual factors (time of year, changes in students' life situation, etc.) that can influence the positive development of this type of learning. Continuous monitoring and evaluation would increase the effects of social and emotional learning programs over time.
- **Implementation method:** While all programs seem to have positive effects, the evidence shows that these are amplified when applied in a certain way. Programs which incorporate the SAFE (Sequenced, Active, Focused and Explicit) approach, seem to perform better than those which do not. Thus, the evidence suggests that social-emotional skills are more easily acquired in programs that perform actions sequentially, make students take an active role, focusing on specific aspects and with explicit objectives.
- **Measurement of skills:** Although all programs included in the reviews referred to in this article have some measure of systematic socio skills before and after the intervention, it seems obvious that we should work together to establish a common and better-structured methodology to enable comparison of outcomes from the different programs.
- **Involving families:** The fact of involving parents in the program and highlighting the importance of social-emotional skills in the positive development as a person facilitates the implementation of such programs and their sustainability over time.

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What Works in Education?

Using Evidence to Improve Education

Teaching self-regulation and metacognition in class: what works and under what conditions?



Gerard Ferrer-Esteban

Researcher at the Fundació Giovanni Agnelli and member of the Interdisciplinary Group on Educational Policies (GIPE-IGEP) of the Universitat de Barcelona.

Motivation

One of the most complex and exciting challenges facing teachers in primary and secondary schools in Catalonia is that the responsibility to be the driving force for learning does not fall principally on their shoulders, but rather that it depends mainly on the motivation and interest of students to learn. Cognitive processes, learning strategies, motivation and self-perception toward studies are key processes upon which learning depends. Making students aware of managing these entails discussing **self-regulation**. However, asking students to self-regulate implies another fundamental psychological process known as **metacognition**: students reflect, become aware of their own skills and knowledge and understand the learning process they follow.

Currently, in **Catalonia**, work on self-regulation plays a very important role within the framework of **curriculum for skills**. In fact, the concept of self-learning integrates naturally with the guidelines at all levels of compulsory education [1], it is referred to explicitly in the curricular development of pre-school and primary education [2][3] and has become one of the most important objectives in the evaluation of primary education [4]. This institutional recognition of learning to learn is therefore, an opportunity for primary and secondary schools to rethink and adapt pedagogical approaches and teaching methods according to these principles.

However, despite knowing that the processes of cognition, metacognition and intrinsic motivation are closely linked to self-regulation and learning improvement, many questions remain regarding the effectiveness of interventions aimed at their promotion and regarding the conditions that make these strategies more effective. This article proposes to answer these questions based on the bulk of empirical evidence on the effectiveness of existing programs to promote self-regulation. In the current situation, we believe that it has become even more necessary than before to understand which practices should be encouraged and which should be reoriented to promote learning.

What do we understand by self-regulation and which programs should we be looking at?

Self-regulated learning is an active and constructive process whereby students set learning goals and try to monitor, regulate and control their cognition, motivation and behaviour. This regulation is obviously conditioned by learning objectives and environmental characteristics [5]. Through self-regulation, the student builds a personal system for learning and improves it progressively in order to become a more independent learner [6].

In this article, we will structure the description of the programs we are reviewing according to the principal self-regulation strategies they expound. Specifically, self-regulated learning is characterized by the interaction between three learning strategies: **cognitive, metacognitive and motivational** [7][8]:

- **Cognitive Strategies.** These include the skills necessary to encode, relate, hierarchize, memorize and recover information [9] [10]. There are several types of cognitive strategies with different levels of complexity: repetition, preparation, organization and problem-solving. They are at a lower level than the metacognitive methods.

- **Metacognitive strategies.**

Metacognition includes strategies that enable students to understand and control their own cognitive processes [9] [10], as well as monitoring and regulating learning. **These make up**

the basis of the self-regulation process [11]. Hence, the so-called metacognitive knowledge refers to knowledge or beliefs about how different variables act and interact to affect the course and the results of a cognitive effort [12]. Such knowledge is a prerequisite for the autonomous use of learning strategies. Students who lack this knowledge find it difficult to understand why and when to use learning strategies [11].

- **Motivational strategies.** Motivation includes beliefs and attitudes that affect the use and development of cognitive and metacognitive skills. For example, we could talk about the reasons why you start a business, the perceived value of this

Metacognition includes strategies that enable students to understand and control their own cognitive processes, as well as monitoring and regulating learning.



activity, when it is considered relevant and useful to do so, or self-efficacy [11] [13]. We must accept that students who possess cognitive skills, but who are not motivated to use them, will have less chances of achieving the same level of performance than those who are more motivated [14].

Programs that encourage and promote these strategies are very heterogeneous

They can be implemented in an integrated manner within the areas of curriculum competencies, or as transversal programs spanning different areas. The degree of structure and complexity of these programs can vary, as well as the number of strategies developed, the duration of the intervention, the educational level in which they are implemented, and the curricular area, etc.

When self-regulation is integrated into curriculum areas such as mathematics or language, metacognition is often developed using **self-instruction, self-control** or **self-regulated learning activities**. For example, in a 1st ESO (first year secondary school in the Spanish system) science class, activities can be proposed which are designed to help students reflect on how they learn. Based on a reading exercise, students can be asked questions about the content of a science text, along with questions which promote meta-reflection on how they answered [15].

When self-regulation is approached in a transversal manner, students can develop the skills by working on individual or group projects, in which they learn to manage and control the learning process itself. In such an activity, the motivational component is key.



When, however, self-regulation is approached transversely across different areas, work can be implemented through individual or group projects, in which students not only **self-assess** but also learn to **manage and control the learning process itself**. In such an activity, the **motivational aspect** is a key component: the child or youth chooses the project, recognizes it and perceives an intrinsic value and projects **expectations for obtaining an outcome**.

Despite the heterogeneity of designs, we can put forward the **three phases** proposed by Zimmerman (2002), which generally **structure a self-regulation process** based on cognition, metacognition and motivation [16]:

1. **Forethought phase** learning activity objectives are established, actions to be taken are planned and outcome expectations and motivations are forecast. We ask ourselves: “Why are we doing it?”, “What is the reason for doing it?”, “What purpose does it serve?” [6][9] [17].
2. **Performance phase**: this is where self-control of the activities comes into play and self-observation is performed. We ask ourselves: “What operations do we need to perform?”, “Why?”, “How are we doing this?”.
3. **Self-reflection phase**: a self-evaluation is carried out. We ask ourselves: “What have we learned?”, “How have we learned it?” [6].

Questions influencing the review

The main question we set out to answer was to what degree do students benefit from programs aimed at promoting self-regulation and metacognition in learning. In addition, we also set out to explore the effectiveness of programs according to their design, student profile, and instructors' teaching style: how should programs aimed at promoting self-regulation be designed in order to be effective? What teaching style should instructors adopt to ensure that these programs are effective? What teaching methodologies and strategies can favour the implementation of these programs?

And finally, we are also interested to know if these programs have a compensating effect on educational and social inequalities: Are there differences in the effectiveness of programs depending on the age and educational level of students? From the perspective of equity, are there differential effects depending on the demographic profile of the students? Do such programs contribute to the learning of academically weaker students? Do they contribute to fostering resilience among socially disadvantaged students?

Reviewing the evidence

For this review, we selected a total of six meta-analyses, which cover around three hundred studies on the effects of self-regulated learning programs (Table 1). Moreover, for the last part of this section, we chose a review of reviews of the cognitive, metacognitive and motivational strategies focused on study. This review covers 14 meta-analyses, 668 studies and over 2,000 effects.

What does the evidence on the overall effectiveness of self-regulation programs tell us?

After reviewing the evidence, we can say that programs designed to promote self-regulation of students have a high level of effectiveness. In the synthesis of the Education Endowment Foundation, **metacognition and self-regulatory programs show the highest levels of effectiveness**, along with intervention programs based on feedback as a strategy for monitoring and the formative assessment of students. Regarding feedback strategies, however, the self-regulatory programs have a broader empirical basis. Based on estimates derived from the meta-analyses used, the Foundation establishes that **students who participate in these programs can expect to gain around eight months in terms of academic progress each academic year**.

The most effective self-regulation programs: areas of application

The following points set out the application variables of programs (subjects, duration, persons in charge of program, target groups) which can determine how effective they can be in terms of improving student learning.

- **Subject.** The intensity of the effects varies depending on the meta-analysis in question. Some studies indicate that these programs tend to favour results in mathematics in primary education and reading comprehension at secondary level [18]. In any case, it is important to note that, in general, a positive impact is observed in all subjects tested: reading comprehension, writing and mathematics [19] [13] [20] [21].
- **Program duration.** In the meta-analyses reviewed, it appears that the duration of the programs is a determining factor [20]. In most meta-analyses, authors highlight that the most effective programs are shorter [11] [13] [20]. Other meta-analyses indicate that programs can be effective if they are longer-term, but not intensive [19], or that the duration of the program is associated with its effectiveness only when the skill being assessed is mathematics [18]. Once again, variations in program design, age of the students and strategies being taught may explain these differences.
- **Educational level and age of students.** On this point, the results are mixed. On the one hand, some meta-analyses indicate that self-regulation programs have a greater impact on boys and girls from ages 12-14 years upwards [19] [21]. Thus, program development would be supported by the fact that students are at the stage of formal operations, characterized by hypothetical reasoning and deductive ability which facilitates the development of metacognition. The students who achieve greater benefit therefore, would be those in higher level secondary education, followed by students in primary education and then pre-school [20]. In other meta-analyses, this outcome is corroborated when the program is applied in literacy, while in the area of math, primary school students are the greatest beneficiaries [18]. Nevertheless, it is important to highlight that the most recent meta-analysis calls this outcome into doubt pointing to an absence of any relationship between program efficiency and the students' level of studies [11][13].
- **Program director.** In more than one meta-analysis, the results of program outcomes are compared according to the person responsible for carrying them out [18] [19] [21]: typically, those involved in implementing programs are the teachers of the subject and a researcher or specialist, often responsible for the design of the study or program. The most recent meta-analyses indicate how the effectiveness of self-regulation programs tends to be higher when the weight of the researcher's role in its implementation is significant [18] [19]. This outcome might be explained by the fact that the researcher is more experienced in the program and its mechanisms and, therefore, may be more effective in its implementation.
- **Academic profile of students.** There is little and inconsistent evidence of differential effects depending on the profile of students. Two meta-analyses found differences, even though they were contained, in relation to the level of skills of the students. These reviews indicated a slightly higher level of effectiveness of programs targeting academically weaker pupils [11] [13] [19]. On the other hand, another meta-analysis examined the differential effectiveness according to three groups of students with different skill levels and found that students of average ability benefitted more from the program, both in terms of performance as well as study skills and affective components such as motivation and self-concept [20]. On the other hand, if we look closely at the quasi-experimental evaluations, we

can see how some programs based on self-regulation show a positive effect on students with learning difficulties, both in cognitive [26] [27] [28] [31] as well as non-cognitive outcomes [29].

- **Student's socioeconomic background.** Regarding the effectiveness of the program for students from socially disadvantaged environments, it is noteworthy that only one of the meta-analyses considered differentiating students depending on their social background. In this case, the effect size among the low socioeconomic status group was high and did not differ significantly from the effect size observed for students with a high socioeconomic status [11]. Meanwhile, some quasi-experimental evaluations have shown that students with a low socioeconomic status may benefit more from these programs [32].

Box 1.

Self-regulated learning programs in Catalonia

Many schools in Catalonia adopt self-regulated learning strategies. The most common practice is to integrate metacognition activities within one of the curriculum areas such as languages or maths. There are also more coherent proposals which anticipate sustained and ongoing self-regulated learning processes over time, such as group project work or individual projects. In some cases, these proposals are designed to innovate and enrich the centre's approach to teaching. In other cases, moreover, innovative learning solutions are being sought to address and correct disadvantaged social situations that hinder learning.

Self-regulation in 'Personal Tasks' in the INS Badia del Vallès public secondary school

In 2009, 95% of early secondary students at the INS Badia del Vallès secondary school were not presenting homework. Although the school had managed to reduce the rate of conflicts thanks to projects such as establishing a conflict mediation service for disputes among peers, support projects and a shared tutoring system, the average levels of efficiency did not improve. From the 2009-2010 academic year, in collaboration with the LIECO (Language and Science Teaching) research group at the UAB, the school orchestrated a series of actions that were decisive: working in cooperative groups, self-assessment and co-assessment processes and working on writing skills in accordance with the principles of self-regulation.

Just over a year later, the results showed not only a significant reduction of students who did not present homework (5%), but also an increase in the average levels of students' competence, raised course advancement and graduation rates in secondary and reduced drop-out levels.

During the 2015-16 academic year, the public secondary school Institut de Badia del Vallès, under the auspices of a newly formed management team, decided to take their educational renovation process that extra mile. This change, in conjunction with other initiatives, focused primarily on the Individual Tasks project. This project was implemented within the first three course years of the ESO and involves a weekly 5-hour space in which every student works on the subject they most require assistance with or that motivates them the most.

One of the implicit objectives of this project is to promote competencies which are key to self-regulated learning. For example, to develop metacognition, the proposal is to decide and plan weekly content jointly between student and tutor; It also encourages students with difficulties apart from relying on their tutor, can also count on their peers to find solutions.

A few teachers of Institut de Badia del Vallès are currently part of the Inspira Secundària network.

The 'Proposals' from La Maquinista (Barcelona)

In the Escola La Maquinista, one of the ways to develop self-regulated learning is through *Proposals*. These are small individual projects which facilitate instruction in self-regulated learning in all its dimensions:

- *Cognitive*: allows students to apply knowledge in different areas, learn new material and relate the knowledge they have acquired.
- *Metacognitive*: based on the child's own actions, who is aware of what they must learn and what they learn from. Students self-assess.
- *Motivational*: the child is the principal actor in their own process, selects the project, is acknowledged and perceives an intrinsic value and projects expected achievement outcomes.

In this context, the teacher assumes the role of mediator in the process of each child thanks to individual attention. Educational response is also adjusted respecting the child's autonomy.

The Escola La Maquinista is one of the promoters of the Escola Nova 21 alliance.

More information:

Escola La Maquinista. (2016). Espais i propostes. (Spaces and proposals) https://prezi.com/xox8_atipdik/espais-i-propostes/

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Box 2.

Self-regulation programs: International examples

Self-Regulated Strategy Development (US)

The SRSD is a writing model created by Dr. Karen Harris (University of Arizona) and colleagues, which encourages students of all educational levels, from pre-school to secondary, to plan, project, edit and revise their own writing. The SRSD provides a clear structure to assist students in writing and can be used for many genres including narrative texts. The main goal is to help children and youth:

- Master the high-level cognitive processes associated with writing.
- Monitor the use and development of strategies for effective writing: brainstorming, planning, creating and organising writing content, reviewing the text using feedback.
- Develop positive attitudes toward the writing process and themselves as writers.
- Identify themselves as competent writers.

There are six basic stages of instruction and four self-regulation strategies, including setting goals and self-monitoring, enabling students to have control over how they understand and develop the writing process. These stages are:

1. *Prior knowledge about students is developed*: the aim is to ensure that students understand, learn and apply the strategy they have been taught. Teachers therefore, are required to know what point students are at, which skills they have and which they lack.
2. *Discuss it*: discuss the importance of being a good writer, explain to students the need to communicate with others in an effective manner. Show the class that a new strategy will be used to strengthen their writing skills.
3. *Model it*: model the strategy to use thinking aloud, speaking to one's self and self-instruction as the process advances.
4. *Make It Your Own*: using mnemonic strategies to help students become familiar with the different steps of the strategy.
5. *Support It*: use the strategy often and in different ways. Students can use diagrams and lists, the way they deem best to make the strategy their own.
6. *Independent Performance*: students apply the strategy independently in different tasks.

Twenty years after the SRSD was first set up, there is a very robust body of research that proves its effectiveness. Much of this research focuses on students from disadvantaged environments with special educational needs and learning difficulties. The program is currently being implemented in the UK, and the Education Endowment Foundation is conducting an evaluation of the program through the *Using Self-Regulation to Improve Writing* project.

Examples of experimental evaluations applied to this program:

Brunstein, J. C., Glaser, C. (2011). Testing a path-analytic mediation model of how self-regulated writing strategies improve fourth graders' composition skills: a randomized controlled trial. *Journal of Educational Psychology*, 103(4), 922-938.

De La Paz, S., Felton, M. K. (2010). Reading and writing from multiple source documents in history: effects of strategy instruction with low to average high school writers. *Contemporary Educational Psychology*, 35(3), 174-192.

Complete list of research projects: <http://www.thinksrsd.com/research/>

Table 1.
Self-regulation programs. Meta-analyses reviewed

Meta-analysis (reference country)	Nº of studies included	Years of studies	Design of primary study	Self-regulation strategies	Duration	Competencies considered	Educational level	Average (AE) and differential effects (DE)	Effect size*
Haller, Child & Walberg (1988) [21]	20	1975-1987	Experimental & quasi-experimental	Consciousness, monitoring & regulation	n/a	Reading comprehension	Primary & secondary education	AE: Performance	0.71
Hattie, Biggs & Purdie (1996) [20]	51	1968-1992	Experimental & quasi-experimental	Strategies associated with the activity, self-management & affective components (motivation & self-concept)	From 1 day to over 1 month	Performance, study and affective skills	Pre-school, primary, secondary, university & adult education	AE: Performance	0.57
								AE: Study habits	0.17
								AE: Affect (motivation and self-perception)	0.48
Chiu (1998) [19]	43	1979-1995	Experimental & quasi-experimental	Metacognitive strategies for reading comprehension	Between 1-36 weeks, average 3 days/school week	Reading comprehension	Primary, secondary & university education	AE: Performance	0.67
Dignath, Büttner & Langfeldt (2008) [22]	48	1992-2006	Quasi-experimental	Cognitive strategies, metacognitive strategies, & motivational strategies	Between 2-90 sessions	Reading comprehension, writing, mathematics & others. Use of cognitive or metacognitive strategies and use of motivational strategies	Primary education	AE: Performance	0.62
								DE: Mathematics	1.00
								DE: Others	0.64
								DE: Reading comprehension, writing	0.44
								DE: Cognitive & meta-cognitive strategies	0.73
DE: Motivational strategies	0.76								
Dignath & Büttner (2008) [18]	74	1992-2006	Quasi-experimental	Cognitive strategies, metacognitive strategies, & motivational strategies	n/a	Reading comprehension, writing, mathematics & others. Use of cognitive or metacognitive strategies and use of motivational strategies	Both levels (n = 74)	AE: Performance	0.69
							Primary education (n = 49)	AE: Performance	0.61
								DE: Mathematics	0.96
								DE: Reading/writing	0.44
							Secondary education (n = 25)	AE: Cognitive & meta-cognitive strategies	0.72
								AE: Motivational strategies	0.75
								AE: Performance	0.54
								DE: Mathematics	0.23
								DE: Reading/writing	0.92
AE: Cognitive & meta-cognitive strategies	0.88								
AE: Motivational strategies	0.17								
De Boer <i>et al.</i> (2013) [11] Donker <i>et al.</i> (2014) [13]	95	2000-2011	Experimental & quasi-experimental	Metacognitive knowledge, cognitive strategies metacognitive strategies & management strategies	Between 1-40 weeks, average of 2.31 days/school week	Reading comprehension, writing, maths & sciences	Primary & secondary education	AE: Performance	0.66
								DE: Writing	1.25
								DE: Sciences	0.73
								DE: Mathematics	0.66
								DE: Reading comprehension	0.36

Source: Prepared by authors based on Haller, Child i Walberg (1988), Hattie, Biggs i Purdie (1996), Chiu (1998), Dignath i Büttner (2008), Dignath, Büttner i Langfeldt (2008), De Boer *et al.* (2013), Donker *et al.* (2014).

* Standardized effect value (Cohen, 1988). Small effect size: 0.2; medium effect size: 0.5; large effect size: 0.8.

Notes: n.a. Not available. AE: Average effect. DE: Differential effect.

The impact of self-regulation programs is positive in all academic subjects and may achieve gains of up to eight months' academic progress.



The most effective self-regulation programs: design and educational proposal

This section will deal with variables associated with the educational design of programs which could determine their effectiveness.

- **Didactic approach.** Self-regulation strategies often entail cooperative didactic methods based on the interaction between students and between student and teacher. This becomes particularly necessary if training and trainer assessment initiatives are carried out [6]. In line with this approach, part of the research confirms that **metacognitive programs show a higher level of effectiveness insofar as students work in small cooperative groups** [19] [18], where students can help each other and explain their reasoning through discussion [23]. The importance of combining methodologies based on self-regulation and methods of cooperative learning is corroborated by experimental evaluations which show robust research outcomes [27] [30].
- **Customization and flexibility.** From a pedagogical point of view, in-class support has been highlighted as one of the most effective factors. Moreover, the importance of having spaces available to implement flexible learning for developing self-regulation has also been acknowledged. Thus, it is understood that **the more education solutions there are, the more effective the programs are.** Insofar as methods of instruction are more varied and combine different teaching strategies, students respond better to the variety of learning styles [21].
- **Combination of self-regulation strategies.** Self-regulation programs can be classified according to their degree of complexity. Programs with a simple structure focus only on instruction of one or more metacognitive strategies. In contrast, **complex self-regulation designs integrate metacognitive learning strategies into educational content and into the learning context.** In the latter case, we are referring to activities where there is a greater transfer of learning [20].

In line with the level of program complexity, studies recognize that the level of program effectiveness increases insofar as it combines several metacognitive learning strategies with motivational strategies, or metacognitive with cognitive methods [21] [22]. However, despite the proven track record for the effectiveness of approaches that **combine strategies, it is still not clear as to which combination best promotes learning** [11] [13] [21]. For example, one of the meta-analyses shows how reading comprehension competencies are higher insofar as lessons combine the use of several metacognitive strategies [21], or how metacognitive and motivational strategies are more effective in improving student learning than solely cognitive strategies [18].

Metacognitive programs show a higher level of effectiveness insofar as students work in small cooperative groups.



The effect of the specific self-regulation strategies: the study process

In this last section, we show the results of a review of reviews of programs involving study strategies and techniques [24] [25] (Table 2). As in the previous section, these strategies fall into three major self-regulated learning categories: cognitive, metacognitive and motivational strategies. This synthesis analysed 14 meta-analyses, containing 668 studies, 2,217 effects and 29,311 subjects.

The overall size of the effect of the programs is 0.59, between medium and high, with significant variability being observed depending on the skill to which we refer. In any case, the premise is the same as in the previous section: although programs covering specific self-regulation skills can have an impact on a superficial level, it is necessary to combine and integrate them with educational content to obtain a more relevant effect in terms of understanding and knowledge. [25]

It is particularly interesting to focus on the first seven strategies with the greatest impact, which show a level between medium and high effectiveness (effect size between 0.50 and 0.85). These strategies can be placed in the different stages of the self-regulation process mentioned previously: strategies for planning and predicting expectations (1, 2) would make up the *forethought phase*; metacognitive strategy of self-instruction, the strategy of asking for help, and cognitive strategies of recording, memorizing and repeating information (4, 5, 6, 7), would be part of the performance phase; and finally, the self-assessment strategy would close the cycle (3), allowing students to reflect on the consistency between task outcomes and previously planned objectives (*self-reflection or self-assessment phase*).

Table 2.
Programs of strategies, skills and techniques of the study process

Strategy	Definition	Description	Effect size
1. Organise & transform	Adjustment of didactic materials to improve learning	Prepare an outline before writing a text (n = 89).	0.85
2. Self-consequences	Student imagines an awards/penalties system for having performed the task well/badly.	Put off pleasurable events until work is completed (n = 75).	0.70
3. Self-evaluation	Establish assessment criteria and use them for self-evaluation.	Review exercises before handing them in to the teacher (n = 156).	0.62
4. Self-instruction	Self-verbalize the steps required to complete a task.	Self-verbalize the steps required to resolve a maths problem (n = 124).	0.62
5. Help seeking	Seek assistance from a peer, teacher or another adult.	Use a study partner (n = 62).	0.60
6. Keeping records	Record the information associated with the study task.	Take notes in class (n = 46).	0.59
7. Rehearse and memorize	Memorize content using a variety of strategies.	Write down a maths formula until you know it off by heart (n = 99).	0.50
8. Review records	Reread class notes, tests or text books to prepare the class.	Review text books or material prior to entering class (n = 131).	0.49
9. Goal setting/planning	Establish learning goals or plan specific objectives and plan the stages and time required to complete the tasks depending on these objectives.	Prepare lists to complete tasks during study (n = 130).	0.49
10. Task-related strategies	Analyse tasks or activities and identify specific methods which make learning easier.	Create mnemonic strategies for remembering facts (n = 154).	0.45
11. Self-monitoring	Observe, follow and record your own academic progress.	Conserve the record of academic outcomes (n = 154).	0.45
12. Time management	Estimate and attribute value to use of time.	Mark on a calendar the time spent each day studying or doing homework (n = 8).	0.44
13. Environmental restructuring	Select or arrange the physical setting to make learning easier.	Study in a quiet and isolated place (n = 4).	0.22

Source: Lavery (2008) [24].

Summary

The self-regulated learning programs benefit the learning of all students more than any other program or intervention that has been evaluated experimentally to date. All the available evidence points to a high level of effectiveness equivalent to a gain of about eight months' academic progress. The fact that there is no clear trend or signposting of the effects depending on the subject, educational level or duration of the programs suggests that the effect, even though it is clearly positive, is transversal to the conditions and population to which it is addressed.

Self-regulation strategies are favoured by flexible and personalized didactic approaches, in which instruction is varied and delivered using a variety of teaching strategies. The more instruction solutions there are, the more effective the programs will be. Metacognition strategies are often more effective when delivered to small

working groups. A plausible explanation for this is that in these contexts cooperative teaching methods are implemented, based on the interaction between students and teacher.

Program structure can vary greatly in terms of complexity. Programs can be delivered in an integrated manner in the areas of curriculum skills or as transversal programs across a range of different areas. They can focus on teaching metacognitive strategies, or strategies can be integrated into educational content and within the learning context. The research points out that programs tend to be more effective insofar as they are integrated into the teaching and educational activities, have a complex structure and combine different self-regulation strategies.

There is no consensus regarding the most appropriate combination of strategies to achieve higher levels of effectiveness. However, it is essential to develop activities that cover the various aspects of self-regulation: cognitive, metacognitive and motivational. Depending on the educational activity, of course, one or another aspect might be prioritized, but they must always go hand in hand. Research indicates, for example, that the most effective self-regulation strategies include cognitive strategies (recording information, rehearsing and memorizing), metacognitive (organizing, planning and self-evaluation) and motivational (projected expectations).

Table 3.
Arguments for and against programs to promote self-regulation and metacognition

For	Against
<ul style="list-style-type: none"> • High level of effectiveness. • Instruction in self-regulation is coherent with curriculum content and approach in terms of competencies. • If implemented structurally, integrating self-regulation in all curricular areas, this allows for cognitive, metacognitive and motivational aspects to be developed globally. • Requires a rethinking of traditional teaching methods: may be an opportunity for innovation. • Can be implemented at all levels of education, adapting the strategies to the different stages of development. • An indirect effect is that it promotes innovation processes in the school, grade year and classroom. • Facilitates the promotion of students' non-cognitive aspects: autonomy, motivation, self-concept. 	<ul style="list-style-type: none"> • Effectiveness depends on the ability to implement program. • Requires greater dedication on the part of teaching staff. • Implementation is complex if the aim is to integrate self-regulation in areas of curricular competencies, going beyond simply instruction in strategies. • Requires a rethinking of traditional teaching methods: may become an obstacle to extend ideas to some educational staff.

Implications for practical application

Programs involving self-regulated learning and metacognitive strategies have the greatest documented impact on educational effectiveness. The review of the evidence on these programs reinforces the need to extend and integrate self-regulation in the various fields of curriculum competencies at both primary and secondary school level. As we mentioned at the beginning, the need for compulsory education to adopt self-regulation processes becomes even more important within the framework of the curriculum for skills. In this sense, the current curriculum implementation in Catalonia presents an opportunity for primary and secondary schools to rethink and adapt pedagogical approaches and teaching methods based on a self-regulatory approach.

The review of the evidence on these programs reinforces the need to extend and integrate self-regulation into the various fields of curriculum competencies at both primary and secondary level.



In effect, the research indicates how we might conform to working certain aspects of self-regulation, as is currently the case in many Catalan schools, to improve average efficiency levels. We can share the learning objectives with students, collaborate with them to plan activities and introduce self-evaluation exercises into everyday class activities. We can teach how, when and why self-regulation strategies should be used. We can also reinforce motivational aspects, such as the perceived value of the activities, self-efficacy and self-concept. Making these changes will represent a major step in the right direction.

However, if we want to raise educational levels even higher, subsequently reinforcing non-cognitive aspects (autonomy, self-concept, self-efficacy), the research underlines that we cannot settle for superficial changes. We must develop articulated didactic approaches that allow us to combine multiple self-regulation strategies, even considering proposals that are transversal to the different areas of curriculum competencies, proposals for rethinking coordination between all areas and which include all teaching staff.

Implementing self-regulated learning at a structural level often requires a change of course from many of the existing educational and pedagogical approaches in Catalan schools. Turning towards methods that allow the development of self-regulation implies, in many cases, reversing pedagogical approaches and teaching methods, or at the very least a rethinking of these methods. Implementing radical change in education is a complex task that is not without difficulties, however the bright side is that the change is well worth the effort.

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© Fundació Jaume Bofill, Ivàlua, 2016
fbofill@fbofill.cat, info@ivalua.cat
www.ivalua.cat
www.fbofill.cat

Authors: Queralta Capsada
and Gerard Ferrer-Esteban
Translator: Diarmuid Raory Magourty
Publishing Technical Coordinator: Anna Sadurní
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