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ARTIGOS

Teacher education: effects of a self-reflective intervention program on socio-cognitive theories of motivation[1] [2] [3] [4] [5]

Formação docente: efeitos de um programa autorreflexivo de intervenção em teorias sociocognitivas da motivação

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Abstract
Continuing teacher education is a frequent theme in the literature. However, studies aimed to analyze teachers, their motivation and learning as a student are scarce. This article reports results of a self-reflective intervention program for teachers, on motivation to learn, conducted in a dual focus: the teacher as a student and as a teacher. The sample consisted of twenty-seven elementary school teachers divided into two groups: experimental and control. The data were collected by qualitative and self-reflective instruments. The intervention increased teachers' self-awareness not only about their motivation and learning, but also about their pedagogical practices, besides expanding their knowledge about motivational theories.
Keywords: motivation, self-reflection, intervention, teaching

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Resumo

A formação continuada de professores é tema recorrente na literatura. Todavia, estudos que visam analisar o professor, sua motivação e aprendizagem como estudante são escassos. Este artigo reporta resultados de um programa autorreflexivo de intervenção para professores sobre motivação para aprender, realizado em dupla vertente: o professor como estudante e como docente. Participaram do estudo 27 professores do ensino fundamental, divididos em dois grupos: experimental e controle. Os dados foram obtidos por instrumentos qualitativos e autorreflexivos. Constatou-se que a intervenção aumentou a autoconsciência dos professores não só sobre sua motivação e aprendizagem, mas também sobre suas práticas pedagógicas, além de ampliar seus conhecimentos acerca das teorias motivacionais.

Palavras-chave: *motivação, autorreflexão, intervenção, docência*

Introduction

The involvement of teachers in professional learning activities is a strong predictor of better teaching practices. However, studies on teacher education emphasize structural dimensions, such as school work conditions, and cultural issues at the expense of psychological factors associated to teachers' learning (Avila, Pranke, & Frison, 2018; Thoonen, Sleegers, Oort, Peetsma, & Geijsel, 2011). The need for continuing teacher education proposed in the *Plano Nacional de Educação 2014-2024* (Brasil, 2014) shows that the student dimension of teachers must be investigated and valued (Hollingsworth & Clarke, 2017; Machado & Boruchovitch, 2019; Szücs, 2018). Nonetheless, there are few national studies and investments focused on knowing and improving teachers' learning process. Boruchovitch (2014), when analyzing several national and international studies on in-service teachers, points out that teachers generally reflect little on how they learn and also tend to not offer opportunities for their students to think on their own learning processes. According to Nóvoa and Finger (2010), during teachers' education and self-development it is key that in-service and pre-service teachers develop an awareness of their own ways of learning. Similarly, Avila et al. (2018) highlight that it is fundamental in the process of self-education for teachers to develop an ability to learn how to learn.

The perspective of self-regulated learning has been used in current studies related to teacher education (Avila et al., 2018; Godfrey, 2014; Zimmerman, 2002). Self-regulated learning is defined as the individual's ability to self-manage and adjust thoughts, feelings, motivations, and actions depending on the task ahead. The importance of self-regulated processes for the

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promotion of a deep and meaningful learning between students and teachers is acknowledged in several investigations (Ardasheva, Wang, Adesope & Valentine, 2017; Boruchovitch, 2014; Boruchovitch & Gomes, 2019; Callan & Cleary, 2018; Frison, Veiga Simão, & Cigales, 2017; Szücs, 2018; Zimmerman, Moylan, Hudesman, White, & Flugman, 2011). Furthermore, these studies show that the individuals' ability to self-regulate their learning is seen as determinant to success in any educational context, allowing several benefits, such as: better information processing; responsibility over their own actions; better problem-solving, knowledge transfer, and general academic performance (Boekaerts & Corno, 2005; Dembo, 2001; Flores, 2012; Machado & Boruchovitch, 2019; Steinbach & Stoeger, 2016).

Among the key variables of self-regulated learning, we can highlight self-reflection and the motivation to learn (Bzuneck, 2009; Callan & Cleary, 2018; De Smul, Heirweg, Van Keer, Devos, & Vandevelde, 2018; Machado & Boruchovitch, 2019). It is believed that studies dealing with self-reflective practices connected to the teaching of motivational content are important for teacher education. If teachers know and are aware of their motivational processes to learn and to teach, they are more understanding, reflective, and analytical on their own beliefs and educational practices. They can also efficiently promote these processes in their students (De Smul et al., 2018; Paris & Winograd, 2003). Furthermore, the knowledge of motivational theories helps teachers develop new ways to understand students' motivation, propose evaluations, and plan classes. Besides those advantages, there are personal benefits for their teaching practice, such as the confidence on their ability to teach and the awareness of their role as models and promoters of situations that can help students feel more motivated (Boruchovitch, 2008; Chatzisarantis & Hagger, 2009; Ryan & Deci, 2020).

The motivational theories started to be more deeply studied by psychology in the mid-1930s. Initially, motivation was tied to the satisfaction of physiological and organic needs of the subjects, such as hunger, thirsty, sleep, and others (Graham & Weiner, 1996). In the 1960s, with the advancements in cognitive theory, the focus of motivation studies turned to the cognitive processes, as choices, engagement in activities, success and failure, and learning in the educational context. This change of focus transformed environments, such as school, into important research fields for motivational studies. Teachers, students, teaching and learning methods gained prominence in the subsequent studies. However, little is known on the main motivation characteristics to learn and the quality of teacher education, pre and in-service

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(Callan & Cleary, 2018; Machado & Boruchovitch, 2019; Reeve, Ryan & Deci, 2018; Ryan, Soenens & Vansteenkiste, 2019).

In general lines, we can see the need to integrate the fundaments of cognitive psychology, the socio-cognitive theories of motivation, and the perspective of self-regulated learning into teacher education, due to the importance of the theoretical knowledge they can provide, as well as the possibility to reflect on the beliefs and the constructs they create, which would certainly contribute to a pedagogical practice more oriented towards a deep and quality learning (Boruchovitch & Machado, 2017; Boruchovitch & Gomes, 2019; Frison et al., 2017). In fact, the perspective of learning self-regulation and the socio-cognitive theories of motivation become relevant to understand the pre and in-service teacher, in their professional dimension, their pedagogical practice, and their student dimension (Boruchovitch & Gomes, 2019; Dembo, 2001; Machado & Boruchovitch, 2019; Parsons, Vaugh, Malloy, & Pierczynski, 2017).

Though learning motivation is a key variable to strategic and self-regulated learning, teachers generally not only ignore their own motivation to learn and teach, but also do not master the main theories on how to motivate themselves and their students (Haerens, Aelterman, Vansteenkiste, Soenens, & Van Petegem, 2015; Reeve & Cheon, 2016). However, it is essential for teachers to know well the socio-cognitive theories of motivation and their psycho-educational implications. Despite their relevance, these theories are little studied and debated in the teacher education courses, especially with a self-reflective focus, which is key for the pedagogical practices that kindle the suitable motivation to learn, study, and teach (Cheon & Reeve, 2015; Slemp, Field, & Cho, 2020; Szücs, 2018).

Thus, the aim of this article is to present the main results of a research that proposed to design and analyze the effects and the efficacy of a self-reflective intervention program, to be developed in a continuing teacher education course for a group of elementary school teachers with the theme "How to motivate students in the school context". We formulated the following hypothesis: the course will broaden the use of teachers' self-reflective practices – as a student and as a teacher – in situations of teaching and learning and it will improve their knowledge on motivation; amotivation; and socio-cognitive theories of motivation.

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The self-reflective intervention program in socio-cognitive theories of motivation

The self-reflective intervention program in socio-cognitive theories of motivation to the continuing education of teachers was developed into the format of an innovative self-reflective course on the main socio-cognitive theories of motivation. Composed of 6 modules, the course had the following syllabus: self-determination theory (SDT), achievement goals theory, and causal attribution theory. It lasted 12 weeks, with an in-person two-hour meeting every fortnight, besides two hours of weekly activities on a virtual platform (Moodle), developed together with the Secretary of Education of a city in the countryside of São Paulo, where the research took place. The first session was aimed at both presenting the objectives of the research and collecting the pre-test data, by the administration of some instruments. The last session was used for the post-test, whose aim was to reapply the instruments used in the pre-test, and give teachers feedback on the activities done during the course.

The course dynamic followed the same sequence. Each module started with a proposition, the execution, and discussion of a self-reflective activity on the theme of the module, followed by a presentation of theoretical content and research evidences on the theme. It finished with an activity of practical application on the content learned. These activities, proposed for self-reflection and discussion, had a double facet: the teacher should analyze the content learned and the questions proposed in the perspective of a student doing the course as well as in their professional perspective.

The following description brings an example of the course dynamic for the first module whose content was the meaning of the terms "motivation", "intrinsic and extrinsic motivation". The first author asked participants to reflect and write on the notebook (field notes) an answer to the question: what motivates you to continue studying? After, there was an open group discussion with this question as a guideline. Next, the theoretical content was orally presented with the aid of power point slides. The themes approached were: what is motivation, its types, examples of activities with intrinsic and extrinsic motivation. At the same time, questions were made to the participants, who would give their opinions on the theme. Later, they were asked to answer a second issue proposed: "to guarantee that students are not bored with activities that are too easy or give up because they consider them above their abilities, in the school tasks, the challenge must be present to strengthen students' intrinsic motivation. Therefore, please, create

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a school activity in any area of knowledge using challenge as a characteristic. If you prefer, you can describe an activity in which you used challenge with your students and had good results". Some participants started talking with the colleagues, as they could not precisely remember an example to answer. After all participants answered, the responses were shared with the group. Finally, the participants were informed on the two self-reflective tasks to be done in the virtual platform. The first asked participants to watch a video on motivation and answer a question on their own motivation as a student. The second self-reflective activity was a question on the application of the content of the module on their teaching practice. They had to be done until the following meeting.

The content of the intervention, the objectives of each meeting, and the activities done to reach them can be found in details on Table 1 in the Appendix.

Method

Participants:

Among the schools in a city in the countryside of São Paulo, Brazil, which volunteered to receive the intervention program, we randomly selected two to compose our experimental and the control groups. All elementary-school teachers from both schools were invited to participate in the research. The sample was composed by 27 teachers. Among them, 14 teachers participated in the Experimental Group (EG), all women, and 13 in the Control Group (CG), 11 women and 2 men. The age range of GE participants was: 23-30 years old (n=4; 29%), 31-50 years old (n=9; 64%) and over 51 (n=1; 7%). At the CG, the ages varied between: up to 22 years old (n=1; 7.6%), 23-30 years old (n=2; 15.5%), 31-50 years old (n=9; 69.3%) and over 51 (n=1; 7.6%). Regarding their time as teachers, in the EG we had the following scenario: no experience (n=2; 14.3%), from 4-10 years (n=4; 28.6%), over 11 years (n=8; 57.1%). At the CG, their teaching time varied among: no experience (n=1; 7.8), from 1-3 years (n=2; 15.4%), from 4-10 years (n=4; 30.7%), over 11 years (n=6; 46.1%).

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Instruments

Applied in pre-test in both groups:

1 – "How to I teach and motivate an amotivated student". Developed by Reeve, Bolt, and Cai (1999), asked participants to briefly describe a situation in which they acted to motivate a student.

2 – "Questions on teachers' self-reflection" (Machado & Boruchovitch, 2014). They consisted of three self-reflective questions aiming to identify the concepts and practices adopted by teachers regarding their motivation to learn.

Answer the questions below as truthfully as possible.

A – What type of class motivates you, when you are the one attending it?

B – What do you do when you have to study something but is not motivated?

C – What do you do to teach classes that motivate your students?

Applied in the post-test in both groups:

In the post-test phase we reapplied the instruments used in the pre-test phase.

Applied in the late post-test – only in the experimental group

3 – "Questions on the self-reflection of teachers" (Machado & Boruchovitch, 2014). The instrument is composed by two self-reflective questions and was applied three months after the end of the intervention program. The first question investigates if the knowledge acquired in the course had been used by teachers in their pedagogical practices. The second evaluates if the socio-cognitive theories of motivation and the self-reflective activities have contributed for teachers to strengthen their self-regulation processes as students:

a. Are you using anything you learned in the course? ( ) Yes ( ) No

If so, retell a situation in which you have used such knowledge in the classroom. If not, explain why.

b. Now, reflect about yourself as a student. Could the course, in some way, help to improve your study abilities and your motivation to learn? If so, describe a situation in which

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the knowledge acquired was useful to strengthen your way of learning. If not, we would like you to explain why.

Data collection procedures

Data collection was held in two phases, previously scheduled, in the best times for the schools and teachers willing to participate. After the contact with the local Secretary of Education, we offered a psycho-pedagogical training in socio-cognitive theories of motivation in a meeting with the coordinators or principals of elementary schools. We have used the opportunity to survey on the coordinators who would possibly like to receive in their school an intervention program on socio-cognitive theories of motivation. Several schools showed an interest to participate in the course "How to motivate students in the school context". However, we selected only two to develop the research. We randomly selected what school would be the control group and which would be the experimental one. The research was approved by the ethics committee and the Secretary of Education of the city, participant teachers signed a consent form. The experimental group (EG) was evaluated in four phases: pre-test, intervention, post-test, and the late post-test; the late post-test was applied three months after the end of the intervention. The control group (CG) participated in the phases of pre and post-test. The application of questionnaires was done in a different place and time in the EG. The time to collect the data and develop the intervention program was agreed with the school coordination that made available the weekly *Horário de Trabalho Pedagógico Coletivo* (HTPC- Collective Pedagogical Work Time), which lasted 2 hours. .

Data analysis procedures :

We made a content analysis of the answers collected by the instrument "How do I teach and motivate an amotivated student" and the information raised by the questionnaire on self-reflection, which were both qualitative. This method of analysis is broadly grounded on qualitative studies and is mainly based on the protocol developed by Bardin (2011). A first analysis, pre-analysis, was held to systematize the initial ideas, guided by the objectives of the research and the theoretical references. Thus, we established the indicators to interpret the information collected. The second phase, exploration of material, considered the construction of coding operations (Mendes & Miskulin, 2017). The text was cut into units of registry after

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we established rules of counting, classification, and, finally, the assembling of information into theme categories. The third phase was the treatment of results, the inference and interpretation, aiming to capture both the content shown and latent in the data collected.

Results and Discussion

The section of results is divided in two parts. The first describes and analyzes the impact of the "Self-reflective intervention program in socio-cognitive theories of motivation" in the teacher as student. The second discusses the intervention impact in relation to teachers' pedagogical practice.

The impact of the "Self-reflective intervention program in socio-cognitive theories of motivation" in the teacher as student.

The results that show the student dimension of the teacher were collected through Instrument 2, *Self-reflective questions*. Table 1 shows teachers' answers to the question: "What type of class motivates you, when you are the one attending it?". The categories emerged from the answers given by participants and were organized according to the frequency of occurrence.

Table 1 – Type of ideal class in teachers' opinion, pre and post-test

Categories	EG pre n[1] %	CG pre n %	EG post n %	CG post n %
Class characteristics	13 (68.4)	13 (65)	14 (70)	12 (70)
Material resources	3 (15.8)	5 (25)	2 (10)	6 (30)
Teacher quality	3 (15.8)	2 (10)	4 (20)	0 (0)
Total	19	20	20	18

[1] Number of answers higher than the number of participants. Each participant could give more than one answer and be included in more than one category.

It is possible to notice that both groups were similar on the pre-test when defining what would be an interesting class when in the role of students. The most recurrent category attributed the success of a class to the methodological procedures used. According to the participants, a motivating class would be dynamic, that is, would mix theories with debates and practical activities, mainly connecting the content taught to real and meaningful

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situations. Besides this, to make it more interesting, the teacher should use multimedia resources – videos, audio, internet, among others- as a support for the selected content.

In the post-test, on the EG and the CG, the most chosen category were class characteristics and, among the answers, the qualities most often cited were "dynamic" and "interactive". However, the EG has shown more varied answers on the qualities of a good class. In other teachers´ reports, it was clear that the course, by dealing with constructs and practices guided by socio-cognitive theories of motivation, had a positive impact on participants' perception, as in these examples:

> T5: Dynamic classes in which, besides thinking on the content, I can act, that is, there is also practice.

> T12: Dynamic participative classes that make me think on the topic and are meaningful.

In the pre and post-test, in both groups, motivation was related to the quality of class, i.e., for the class to be interesting, it should be dynamic, interactive, involve challenges and novelties. This finding is consistent to other studies (Reeve, Ryan, & Deci, 2018; Ryan & Deci, 2020). The use of motivational embellishment strategies and resources that promotes a sense of competence, autonomy, and belonging has long been related to the success in the teaching-learning process (Cheon & Reeve, 2015).

The second question of this instrument asked participants what he/she does when studying a content and feel amotivated. The answers were organized on table 2.

Table 2 – Participants' answers on the amotivation to study

Categories	EG pre n[1]%	CG pre n%	EG post n%	CG post n%
Cognitive Strategies	4 (22.4)	3 (15.8)	1 (5)	3 (17.6)
Metacognitive strategies	7 (38.8)	12 (63.1)	12 (60)	10 (58.9)
Strategies of resource management	7 (38.8)	4 (21.1)	7 (35)	4 (23.5)
Total	18	19	20	17

[1] Number of answers higher than the number of participants. Each participant could give more than one answer and be included in more than one category.

In general, the two groups reported taking some type of attitude regarding amotivation, even when the topic did not please them in both phases. However, on the EG, in the post-test

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phase, the answers were closer to the literature in the area on self-regulation of learning (Machado & Boruchovitch, 2019; Steinbach & Stoeger, 2016; Zimmerman, 2002), compared to the pre-test phase. This can be seen in the following examples:

> T3 – I check if I'll have another date for this study. If not, I make an effort to do it.
>
> T8 – I try to focus and remember my target that is learning about that topic.
>
> T9 – I try to think on what the content will add to my practice.
>
> T12 – I keep on studying and finding other strategies to finish it.
>
> T7 – I try to think that the content might be useful, so I try to study thinking about reaching and achieving the objectives proposed.

The pre-test results point out that the CG participants report a higher use of learning strategies, especially metacognitive ones, when compared to the EG. In this category, there were behaviors as planning, monitoring, and regulation.

After the intervention period, we could perceive an increase on the reports of the use of metacognitive strategies for the EG participants. This evidence could be observed in the answers in the instruments, as well as in the self-reflective activities. This change is relevant because, according to Boruchovitch (2008), the use of metacognitive strategies is greatly associated to the self-regulation of learning, allowing individuals to invest more effort on tasks, in the future, thus, reaching a deeper and meaningful learning (Ardasheva et al., 2017; Dembo, 2001; Godfrey, 2014). The learning of this type of strategies by teachers can later lead them to promote the teaching and the development of these abilities in their students (Szücs, 2018).

The third question proposed in this instrument asked participants to describe what they did to teach classes that motivated their students. Table 3 summarizes their answers.

Table 3 – What do I do to give good classes?

Categories	EG pre n[1]%	CG pre n%	EG post n%	CG post n%
Class quality	10 (50)	11 (52.4)	11 (50)	10 (52.6)
Material resources	7 (35)	4 (19)	7 (31.8)	5 (26.3)
Teacher's characteristics	3 (15)	6 (28.6)	4 (18.2)	4 (21.1)
Total	20	21	22	19

[1] Number of answers higher than the number of participants. Each participant could give more than one answer and be included in more than one category.

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It was possible to notice that, in both groups of teachers, teaching a good class is associated to the quality of class itself. In this sense, participants highlight the importance of diversifying strategies, using games and fun, and bring the syllabus closer to students' reality. Bzuneck (2009) argues that autonomous and positive motivation in the school environment is related to the quality of involvement in the activities, effort investment to learn challenging tasks, allowing, then, the construction of knowledge . Ryan and Deci (2020) argued that the teachers' actions in the classroom that would promote the types of autonomous motivation were those that satisfied the basic psychological needs of any human being: competence, belonging, and autonomy. Furthermore, meaningful tasks, connected to the real world should be prescribed to contextualize the student and show possible uses of the knowledge learned. The results presented on Table 3 corroborate those found in the literature, as teachers were able to recognize these qualities in the post-test (Haerens et al., 2015; Reeve & Cheon, 2016; Ryan & Deci, 2020).

The impact of the "Self-reflective intervention program in socio-cognitive theories of motivation" in teachers' pedagogical practice.

Table 4 shows the results of the analysis of Instrument 1. The data allowed us to evaluate the second part of the hypothesis – that the course would improve the knowledge of participant teachers on motivation and amotivation.

Table 4 – Participants' concepts on students' amotivation

Categories	EG pre n[1]%	CG pre n%	EG post n%	CG post n%
Amotivation due to low ability	1 (4.5)	2 (7.7)	5 (20)	2 (13.5)
Amotivation due to little effort	6 (26)	7 (27)	6 (24)	4 (26.6)
Amotivation due to low task value	9 (39)	9 (34.6)	11 (44)	4 (26.6)
Amotivation due to students' personal characteristics	7 (30.5)	8 (30.7)	3 (12)	5 (33.3)
Total	23	26	25	15

[1] Number of answers higher than the number of participants. Each participant could give more than one answer and be included in more than one category.

For EG teachers, amotivation seems to be mainly connected to the perceived low task value, the lack of energy and effort invested in the proposed activities, and students' personal

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characteristics. Teacher 7 described: "Last week I was faced by an amotivated student, with a sad look, with no will to sit down and pick the material for the class"; Teacher 3 told "I remember a class in which there were many students in this situation. No matter what you did, you couldn't reach the student. It was one of those that showed that it didn't matter, nothing would shake him up, and nothing motivated him".

For CG teachers, in the category amotivation, the justifications of 'low task value' and 'students' personal characteristics' were the most cited. Teacher 10C comments: "a 9th grade student, she doesn't like Physical Education, she refuses to participate in the practical classes" Teacher 5C shares: "the student doesn't participate in the classes, doesn't answer teachers' questions, doesn't interact with the classmates, and thinks that everything is a pain".

It was interesting to see that, after the intervention program, EG teachers increased their amotivation attributions to the perceived low value of the task, lack of energy and effort to engage in the activities proposed, and decreased their justifications on students' personal characteristics

> Teacher 6 – Today I talked with a student that was really not motivated and I tried to make him think on the actions he could change, the effort must come from within him.

> Teacher 11 – I'm working on the project World Cup for around 45 days and this week we were showing and exhibiting what we produced in the schoolyard. I didn't see any apathetic student because they were all engaged on showing what they had produced. That is, an amotivated student that is not normally active and doesn't participate much, in tasks such as this, acts naturally, because they can see and develop an intrinsic and extrinsic motivation to actively participate in the learning process.

On the CG, four teachers did not answer this question. Those who described the amotivated student mostly opted for the category related to students' personal characteristics. Among the examples of this group, teacher V. describes an "apathetic student who prefers to copy the answers then trying to solve the challenges, to not go through the mistake, he would rather wait for the solution".

The results that arose from the pre-test on the definition of amotivation have shown that both groups had similar concepts regarding the categories originally presented in the literature of the area (Cheon & Reeve, 2015; Reeve et al., 2018; Ryan & Deci, 2020). However, it was possible to notice that some teachers related amotivation to indiscipline and components of aggressiveness. According to Cheon and Reeve (2015), amotivation is closer to a state of

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apathy, when students have little or no reason to invest the necessary energy and effort to learn to do something. Thus, behaviors as indiscipline, commotions, and aggressiveness would be expected by a student who simply does not see the need to get involved with the classroom environment. In the post- test, we could see that the EG teachers, in their reports, described the amotivated student with more theoretical knowledge, closer to the definition proposed by Cheon and Reeve (2015), Ryan and Deci (2020), and Ryan, Soenens, and Vansteenkiste (2019). On the CG, some teachers did not define the term and those who did used words as "lack of interest", "sadness", and "absence" to refer to amotivation. We could see that in both groups the definitions were very similar to what is theoretically proposed (Ryan & Deci, 2020).

However, the intervention procedure could have created a clearer definition on the concepts of motivation and amotivation for EG teachers. In another perspective, adopting the definition of amotivation based on the lack of effort, that is, on the lack of will to spend the necessary energy to enact a certain behavior or a particular task, is more interesting and able to be overcome, as teachers can stimulate and create strategies for students to invest more energy in future activities.

The answers to the second question, related to the strategies used to motivate these students, can be seen on Table 5.

Table 5 – Description of strategies to motivate an amotivated student

Categories	EG pre n[1]%	CG pre n%	EG post n%	CG post n%
Focus on the student	9 (25.7)	10 (27)	11 (24.5)	8 (25)
Incentivize initiative	7 (20)	4 (10.8)	7 (15.5)	7 (21.9)
Show the reasons	7 (20)	7 (19)	4 (8.8)	6 (18.7)
Nourish competence	3 (8.6)	4 (10.8)	9 (20)	3 (9.4)
Use non-controlling language	4 (11.4)	9 (24.3)	5 (11.2)	5 (15.6)
Value task	5 (14.3)	3 (8.1)	9 (20)	3 (9.4)
Total	35	37	45	32

[1] Number of answers higher than the number of participants. Each participant could give more than one answer and be included in more than one category.

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On the pre-test phase of EG, the occurrence of the categories were balanced. For example, Teacher 3 said:

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> At that time, I decided to try to be a "friend". It was a difficult class, a complicated project. I got closer to them, bargaining, for instance, "try to solve this exercise and I'll play ball with you in the courtyard", or "do that activity and we will arm wrestle", and so on. This way, that class especially could count on me on everyday moments. I needed to teach them school things, but also show a bit of the life outside. I had to show them a path that was not the one of drugs, robbery, and ill-treatment. I liked the results.

Teacher 6 described that "Talking and understanding the students makes it so that the interaction helps create a relationship of trust. This can result in changes of attitudes in both sides".

We can see in both excerpts, teachers' will to create an empathic atmosphere that favors connection and a more pleasant learning environment. However, in another report it is evident that, often, only the actions of the teachers and the pedagogical staff were not enough to solve the classroom problems. This was related by Teacher 8:

> To try to revert this situation, I mainly talked with the student and questioned why he was acting this way. He did not explain and, in the following day, he attacked a classmate. He was warned because of this attitude. The problem was not solved, as he physically attacked the classmate once more, and was suspended. In the conversation with the mother, she said that he does not respect or listens to what she says. We talked with her about the rules, respects, and limits, so that she could demand these from him at home, and to respect classmates and teachers at school.

On the CG, in the pre-test phase, the category 'focus on the student' was observed in most answers. It was interesting to see that the CG teachers presented more complete reports which were more tied to the discourse of promoting autonomy than those in the EG, as can be seen in the following statement:

> Teacher 2C – To get closer to the students I tried to get to know their reality and why they presented such type of behavior. I tried many ways to get closer, always with patience and dialogue. The beginning was not easy, but afterwards it was very gratifying. Knowing why the person has an attitude changes completely the goal. I always try new pathways to reach my goals. I look for help in talks with colleagues, coordinator, sites, and experts. The best way is to know what is making the subject act that way. After recognizing that, set goals and objectives. Each one has their way of acting and reacting. We have to understand and help in this learning process.

The post- test results show an increase on the answers of interactions that promote autonomy reported by the EG groups, when compared to the CG. In the EG, three categories stand out: 'focus on the student', 'nourish competence' and 'value of task'. As an example we quote:

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> Teacher 4 – I talked with him, guiding him to make the tasks, because his attitude indicated amotivation but I was sure he could do much better if he tried to do the activities.

On the CG there was a lower number of this type of answer than in the EG. The most quoted categories were: focus on the student, incentivize the initiative, and show the reasons. The reports were shorter, when compared to the pre-test phase. However, the content of the answers was also aligned with what is theoretically proposed by Ryan and Deci (2020) regarding the strategies to promote learning motivation. For example:

> Teacher 2C – I invited a student to talk alone with me and asked what was going on with him/ in his family. From that, I looked for solutions to encourage this student to move forwards, showing that there are possibilities and ways out.

Post-test results have shown an increase on the reports that use strategies to support of autonomy among EG students, by stimulating autonomous motivation. To this group, ideas on how to understand students' situation and nourish their need of the competence appear in most reports.

Consistent with other experimental studies focused on the theory of self-determination (Chatzisarantis & Hagger, 2009; Cheon & Reeve, 2015; Reeve et al., 2018; Ryan & Deci, 2020; Ryan et al., 2019), the data of this article show that the teachers who participated in the intervention have increased the accounts on the use of strategies that favor motivation.

Late post-test

The phase of late post-test, done three months after the end of the intervention, aimed to identify if the intervention program promoted positive changes in the participants' learning, as students and as teachers. In this phase 11 teachers from the EG, out of the initial 14 took place. The first question in the questionnaire was: "Are you using anything you learned in the course?" All teachers answered yes. The second questions asked: 'If so, retell a situation in which you have used such knowledge in the classroom. If not, explain why.' and 'If not, we would like you to explain why.'

The answers obtained were mostly positive. Regarding the gain for the pedagogical practice, we can quote: the use of more collaborative methodologies, as group talks; group activities; interesting and challenging material; use of other school spaces; more direct and frequent evaluation, without accumulating much content; students' active participation. Besides

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this, there are personal benefits on their practice, such as confidence in their ability to teach and awareness of their role as influencer and generators of situations that can help their students to feel more motivated.

The third part of the post-test asked participants to reflect on themselves as students and answer the question:

> Could the course, in some way, help to improve your study abilities and your motivation to learn? If so, describe a situation in which the knowledge acquired were useful to strengthen your way of learning. If not, we would like you to explain why.

According to teachers' answers, the course led to personal benefits related to self-regulated learning: better time management, concentration, effort, use of self-reflection on learning activities, valuing of the knowledge to be learned, recognition of limitations and needs to improve study, and motivation to learn. Thus, benefits to teachers' practice are portrayed on the new ways of understanding students' motivation, of proposing evaluations, planning classes, among others. These are positive effects, showing the reach of the objective of this study, considering the qualitative changes in teachers' self- perceptions as students and of their educational practices (Boruchovitch & Machado, 2017; Flores, 2012; Frison & Veiga Simão, 2011; Machado & Boruchovitch, 2019).

Final Considerations

The current context of Brazilian education requires, through *Plano Nacional de Educação 2014-2024* (Brasil, 2014), teachers' education and training to be a permanent and innovative process. This article presented the results of a research aiming this goal, to design and analyze the efficiency of a self-reflective intervention program developed in a continuing education course for teachers on motivation in the school context. We can see that the results, though modest in some aspects, were very promising and show important gains for the experimental group that took part in the intervention.

The analysis on the impact of the intervention program in the teacher as a student has shown gains in the self-awareness of time management, increase in concentration and effort, broadening of the use of self-reflection in other learning activities, higher value to the knowledge

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to be learned, recognition of their own limitations, and the needs to improve in study situations. Teachers, in their teaching roles, have broadened their knowledge on socio-cognitive theories that grounded the motivation to learn and the practices that promote autonomous motivation, such as a higher promotion of cooperative activities that stimulate students' participation and fulfill basic psychological needs. Teachers also started to better understand the importance of using more challenging and meaningful activities and more closer and direct evaluations. Teachers' learning processes affect the way they teach, and a way of influencing their teaching strategies is, therefore, enriching their behavior as teachers-students. If they experience the efficiency of their own abilities of self-regulation, teachers might be more willing to promote it on their students.

Beyond those remarks, we hope that this study can stimulate Brazilian researchers to invest in interventions with teachers around themes related to cognitive psychology, mainly regaining self-regulated learning and motivation to learn. Through initiatives such as this, we can expect more data and information to design other proposals that can help teachers of different schools and regions of the country. Thus, stimulating the development of scientific thought and the production of knowledge among different professionals in the area of education. We suggest that future interventions should aim on increasing teachers' awareness on alternative teaching approaches, looking for ways to promote teachers' self-realization and self-development. Focusing on the themes dealt in this intervention program is a positive future direction, as, these topics are little explored in the undergraduate courses. If they are learned in depth they will certainly bring many benefits to the learning-teaching process.

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APENDIX

Table 1 – Self-reflective intervention program on socio-cognitive theories of motivation

Content	Objectives	In-person meeting	Virtual Platform
MODULE 1 Meaning of the term motivation in psychology Intrinsic motivation and its characteristics: challenge as a pedagogical strategy Extrinsic motivation and its characteristics	– Allow participants to reflect on their motivation and how it can interfere in the activities to be proposed in the course. – Analyze the relations established by participants of the content presented and its potential to be applied in their teaching practice.	Pre-test. Self-reflective activity 1. (as a student) Answer the guiding question: "What motivates you to keep on studying?" – Self-reflective activity 2 (teaching practice): create a school activity in any area using challenge as a characteristic.	– Self-reflective activity 1. (as a student). Watch a video on motivation and answer a question on their motivation to study – Self-reflective activity 2 (teaching practice): answer a question on the application of the content in their practice
MODULE 2 Intrinsic and extrinsic motivation Motivation according to the self-determination theory	– Stimulate participants to reflect on the reasons why they and the students engage in academic activities. – Analyze participants' understanding on the benefits and disadvantages of using external rewards as students' motivation.	Self-reflective activity 1. (as a student) Answer a question and participant on a practical activity on the reasons to engage in a task – Self-reflective activity 2 (teaching practice): practical activity on intrinsic and extrinsic motivation	Self-reflective activity 1. (as a student). Research models of online educational games that are motivators in itself and describe the experience – Self-reflective activity 2 (teaching practice): analyze a cartoon and propose evaluation models based on self-determination theory
MODULE 3 Motivation according to the achievement goal theory	– Establish and evaluate the goals to the development of the activities during the course - Reflect on the goal to be achieved with a task and enact the ability to evaluate its fulfillment	Self-reflective activity 1. (as a student) Establish personal goals, as students, for the ongoing course - Self-reflective activity 2 (teaching practice): create an example table with the goals for a classroom activity	Self-reflective activity 1. (as a student). Answer a question on their plan for the study activities, according to the goal theory – Self-reflective activity 2 (teaching practice): apply the content learned to a classroom activity

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MODULE 4 Motivation according to the theory of causal attribution	Show that feelings as injustice, incompetence, and failure can lead to quitting activities Promote a reflection on how competent the participants fell about the task of learning something	Self-reflective activity 1. (as a student) Participation in a game of general knowledge with 2 groups; reflection on the feelings and emotion arisen in the activity. – Self-reflective activity 2 (teaching practice): issues on personal efficiency in a task, feeling of incompetence/competence, success/failure in the activities proposed to students.	Self-reflective activity 1. (as a student). Answer a question on the theory of casual attribution. - Self-reflective activity 2 (teaching practice): Apply the content learned in a classroom activity
MODULE 5 Impact of contextual factors in the motivation to learn	– Stimulate participants to reflect on the causes of indifference and amotivation in learning situations – Promote a reflection on teaching practice and the use of strategies to increase motivation.	Self-reflective activity 1. (as a student) Reflect on the problems, the people, and the situations that can hinder or decrease motivation to continue to study. – Self-reflective activity 2 (teaching practice): Analysis of teaching practice, guided by the question "Do you think you are adopting any of the strategies presented in the course?"	Self-reflective activity 1. (as a student). Answer the question on how teachers' feedback can be important to learning – Self-reflective activity 2 (teaching practice): Apply the content learned to a classroom activity
MODULE 6 End of the course	Promote a self-reflection moment on the participation in the course and its possible benefits	Self-reflective activity 1. (as a student) Analysis of the learning reached in the course as a student – Self-reflective activity 2 (teaching practice): Analysis of the teaching practicing, using as a guiding axis the theories presented in the course. Post-test.	Self-reflective activity 1. (as a student). Self-evaluation as student – Self-reflective activity 2 (teaching practice): Self-evaluation as teacher

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