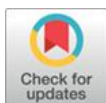


Social self-regulation strategies: reports of use in an intervention with high school teachers



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Abstract

This article aims to analyze the effects of an online intervention on the report of the use of social self-regulation strategies by high school teachers in a continuing education course. The research was conducted through a quasi-experimental design with 14 teachers, using a mixed approach to analyze data collected before and after the intervention. To this end, a structured questionnaire containing 15 questions prepared for this research was used. The intervention, based on curricular overlap, addressed social, cognitive and metacognitive self-regulation strategies. The results did not demonstrate statistically significant differences for the social self-regulation strategies used, however, they showed the increased use of digital technologies, such as WhatsApp, for social support. In general, the intervention proved to be effective in promoting behavioral adjustments and strengthening communication among teachers, highlighting the importance of social self-regulation strategies in the educational environment.

Keywords

social self-regulation; High School; learning strategies; intervention; teachers.

Estratégias de autorregulação social: relatos de uso em uma intervenção com professores do Ensino Médio

Resumo

Este artigo tem como objetivo analisar os efeitos de uma intervenção realizada *on-line* no relato de uso de estratégias de autorregulação social por professores do Ensino Médio em um curso de formação continuada. A pesquisa foi conduzida por meio de um delineamento quase experimental com 14 docentes, utilizando uma abordagem mista para analisar dados coletados antes e após a intervenção. Para tanto, foi utilizado um questionário estruturado contendo 15 questões elaborado para esta pesquisa. A intervenção, baseada em sobreposição curricular, abordou estratégias de autorregulação social, cognitiva e metacognitiva. Os resultados não demonstraram diferenças estatisticamente significativas para as estratégias de autorregulação social utilizadas, no entanto, evidenciaram o aumento do uso de tecnologias digitais, como o WhatsApp, para suporte social. De forma geral, a intervenção mostrou-se eficaz em promover ajustes comportamentais e fortalecer a comunicação entre os professores, evidenciando a importância de estratégias de autorregulação social no ambiente educacional.

Palavras-chave

autorregulação social; Ensino Médio; estratégias de aprendizagem; intervenção; professores.



Strategies of social self-regulation: reports of use en una intervención con profesores de Enseñanza Media

Resumen

Este artículo tiene como objetivo analizar los efectos de una intervención en línea en el informe de uso de estrategias de autorregulación social por parte de los profesores de Enseñanza Media en un curso de formación continua. La investigación se llevó a cabo mediante un diseño cuasi experimental con 14 docentes, usando un enfoque mixto para analizar los datos recogidos antes y después de la intervención. Para ello, se utilizó un cuestionario estructurado con 15 preguntas, elaboradas específicamente para esta investigación. La intervención, basada en la superposición curricular, aborda estrategias de autorregulación social, cognitiva y metacognitiva. Los resultados no mostraron diferencias estadísticamente significativas en el uso de las estrategias de autorregulación social, sin embargo, evidenciaron un aumento en el uso de tecnologías digitales, como WhatsApp, para el apoyo social. En general, la intervención resultó eficaz en promover ajustes conductuales y fortalecer la comunicación entre los profesores, destacando la importancia de las estrategias de autorregulación social en el entorno educativo.

Palabras clave

social self-regulation; Enseñanza Media; learning strategies; intervention; teachers.

1 Introduction

This work is part of a broader research, derived from a doctoral thesis carried out during the pandemic context, which investigates the impact of an educational intervention on the use of cognitive, metacognitive, motivational, affective and social self-regulation strategies among high school teachers. Self-regulation refers to an individual's ability to manage their own thoughts, emotions, and behaviors to achieve specific goals (Bandura, 1991). It involves processes such as monitoring, control and adjustment of one's own actions in response to internal and external stimuli (Bandura, 2018). For Romero-Ayuso *et al.* (2022), social self-regulation is the application of these processes in social contexts, where interaction with others is fundamental. It involves the ability to adjust behaviors according to social norms, expectations and feedback received in collective environments (Warschburger *et al.*, 2023). A student who practices social self-regulation can decide when it is most appropriate to ask for help during a class or how to participate in a group discussion productively (Martínez-López *et al.*, 2023). This form of self-regulation is crucial for academic success, as it helps students efficiently face the complex social dynamics that influence learning (Ezmeçi; Parpuçu; Akman, 2022).

Social self-regulation strategies are practices that involve the use of interpersonal interactions to promote individual and collective learning. These strategies include activities such as asking for help, group study, and participating in collaborative discussions (Toyokawa; Whalen; Laland, 2019). Asking for help, for example, can occur when a student seeks clarification from peers or teachers, which not only clarifies specific doubts, but also strengthens the bond between members of the educational community. Studying in groups is another important practice, allowing students to share different perspectives, clarify each other's doubts and develop teamwork skills (Rania; Coppola; Pinna, 2021). These strategies are based on the idea that learning is enhanced when students engage in collective practices, in which knowledge can be built and negotiated together, facilitating the understanding of complex contents (Toyokawa; Whalen; Laland, 2019).

In the academic context, social self-regulation strategies play a key role in fostering student collaboration, resilience, and adaptation. By utilizing these strategies, students are able to seek out and offer mutual support, which not only improves academic performance but also contributes to the development of crucial interpersonal skills such as communication, empathy, and problem solving (Amerstorfer; Münster-Kistner, 2021). By studying in a group, students can explain concepts to each other, strengthening their understanding and retention of information. In addition, positive social interaction can increase motivation, reduce stress, and create a more inclusive and welcoming learning environment. Social self-regulation strategies also help build a support network, which is essential to address academic challenges and maintain emotional well-being (Bahtiar *et al.*, 2023).

Depending on some factors, teaching social self-regulation strategies can be especially challenging. One of the main difficulties is the diversity of learning styles and personalities among students, which makes it challenging to create pedagogical approaches that effectively serve everyone (Baumeister *et al.*, 2007). In addition, some learners may resist using these strategies due to factors such as shyness, fear of judgment, or lack of social skills. Another limitation is the difficulty of accurately evaluating and measuring the effectiveness of these strategies in academic development (Cordier *et al.*, 2021).

The teaching of social self-regulation strategies, especially in teacher training courses, includes practical challenges that go beyond theoretical aspects. The lack of

adequate physical space can hinder the implementation of collaborative and mutual support activities, which are fundamental for the development of these strategies. An enabling environment is essential to create areas of emotional support or reflection rooms (Thornhill-Miller *et al.*, 2023).

Difficulty in reconciling schedules between teachers can be an additional barrier. In teacher training courses, they often deal with simultaneous academic and professional commitments, which makes it complex to schedule collective activities that promote social self-regulation. The logistics of gathering groups at compatible times and in suitable environments is often complicated, resulting in an impossibility of implementing these strategies (Forsell *et al.*, 2021).

According to Ozimek and Förster (2021), in distance learning contexts, these limitations are even more pronounced, since the lack of face-to-face interaction can reduce the opportunities for collaborative practices and mutual support. These barriers highlight the need for careful planning and innovation in the integration of social self-regulation strategies, ensuring that they are applicable and accessible in diverse educational contexts. Explicit teaching of social skills such as assertive communication and cooperation can help better integrate social self-regulation strategies into pedagogical practice, making the learning environment more collaborative and effective.

Research investigating interventions focused on teaching social self-regulation strategies has shown promising results (Ateş, 2022; Mammadov; Schroeder, 2023; Muwonge *et al.*, 2020). Studies indicate that these interventions can lead to a significant increase in participants' use of these strategies, resulting in improvements in academic achievement and emotional well-being. For example, interventions that teach specific techniques of requesting help and group cooperation resulted in a greater willingness of students to seek support and collaborate, which, in turn, improved understanding of the contents and active participation in academic activities. In addition, these interventions often result in a more cohesive classroom environment, where students feel more comfortable sharing their difficulties and working together to overcome them (Amerstorfer; Münster-Kistner, 2021; Bahtiar *et al.*, 2023; Toyokawa; Whalen; Laland, 2019).

The present research is justified by the need to deepen the understanding of how educational interventions can improve the use of social self-regulation strategies among high school teachers, a group that plays a crucial role in the academic and social formation

of students. Previous studies suggest that despite the recognized value of these strategies, there is a significant gap in the development and systematic application of interventions aimed at strengthening social self-regulation skills among educators. The objective of this study is to analyze the effects of an intervention on the use of social self-regulation strategies by high school teachers.

2 Methodology

This study was conducted as quasi-experimental research, encompassing the pre-test, intervention and post-test stages, within a mixed, qualitative and quantitative approach. The quasi-experimental design allows us to observe the effects of specific variables on study subjects, subjecting them to conditions controlled by the researcher (Morettin; Bussab, 2024). The mixed approach facilitates the translation of opinions and qualitative information into numerical data, using statistical techniques for analysis and interpretation (Fávero; Belfiore, 2024).

The intervention followed the curriculum overlap model proposed by Rosário and Polydoro (2015), occurring outside the regular curriculum, in activities such as projects or extension courses. This approach was designed to teach social self-regulation strategies, promoting the adherence of participants without directly interfering in the professional or academic context.

2.1 *Participants*

All 57 teachers at the school were invited to participate, of which 25 agreed to participate in the intervention proposal. After defining the intervention times, 16 teachers remained in the study. The age of the participants ranged from 29 to 66 years, with a mean of 45.5 years. Two teachers dropped out after Session 8, leaving a final group of 14 participants with diverse academic backgrounds, such as Sociology, Philosophy, Mathematics, among others. The time since graduation ranged from 8 to 40 years, with an average of 19.25 years, and the time of professional practice ranged from 7 to 42 years, with an average of 19.68 years. The majority (81.25%) worked 40 hours a week and had a specialization, and 35.71% had already participated in the Paraná State Educational Development Program (PDE). Six had attended courses related to Educational Psychology, while eight had not. At the time of the research, 37.5% of the teachers were not studying, 31.25% were in continuing education, 12.5% had a master's degree, 12.5% were in a second degree and 6.25% participated in courses and workshops.

2.2 *Instruments*

Two main instruments were used in this research. The first was a sociodemographic questionnaire applied to the participating teachers, which addressed variables such as age, gender, academic background, participation in continuing education courses and details about their professional practice. The second was a structured questionnaire focused on self-regulation strategies, composed of 15 questions based on the guidelines of Cruvinel and Boruchovitch (2019). Three of these questions were aimed at understanding the constructs related to social self-regulation. An example question explored the application of social self-regulation strategies, as in the following example: “a) Do you prefer to study alone or in a group? Why?”

2.3 Ethical procedure and data collection

The project was approved by the Research Ethics Committee of the State University of Londrina, Paraná, Brazil (Opinion number 3,762,483). All teachers were informed in detail about the objectives, procedures and potential benefits of the research and, upon agreeing to participate, signed the Informed Consent Form (ICF). Participation involved a 50-hour continuing education course, certified by the university's Dean of Extension, Culture and Society.

2.4 Pre-Test

In the pre-test stage, carried out in person, the participants completed the Sociodemographic Questionnaire and the Structured Questionnaire. Although there is no doubt about the Structured Questionnaire, some participants asked for help in completing the Sociodemographic Questionnaire. The application of the questionnaires took, on average, 50 minutes, after which the intervention phase began.

2.5 Intervention

The continuing education course lasted one semester, totaling 50 hours, divided between face-to-face meetings and remote activities. Intervention sessions focused on social, cognitive, metacognitive, and contextual self-regulation strategies. Of the 50 hours allocated to the course, eight were specifically aimed at teaching social self-regulation strategies (Sessions 1 and 17). However, these strategies were also addressed in other sessions, according to the convenience and needs presented by the students. Each session included previous readings, theoretical classes and practical activities, encouraging the application of the strategies in the teachers' professional daily lives. Due to pandemic restrictions, most sessions took place remotely, but teacher engagement was maintained. During the sessions, the concepts, methods, steps and skills of social self-regulation were addressed, including reflective questioning and practical examples.

In Session 1, teachers were introduced to different types of social self-regulation strategies, such as asking for help, group study, peer tutoring, asking someone to explain

the content, and using digital tools such as email, WhatsApp, and Google Meet to implement these strategies. It is noteworthy that, throughout the intervention sessions, this content was resumed. In Session 17, these strategies were reviewed, and participants had access to the post-test results, which allowed them to observe, discuss and reflect on the results, promoting a critical analysis of their progress and the practices adopted throughout the course.

2.6 Post-Test

In the post-test phase, teachers participated in a virtual meeting via Google Meet, where they received the same pre-test instructions. They were instructed to answer the structured questionnaire online, without distractions, with an average time of 50 minutes.

2.7 Data analysis

Data analysis included comparison of pre-test and post-test results. After careful reading of the answers, the data were codified following the guidelines of Bardin (2011). The categories were analyzed by two judges with PhDs in Education, with a correspondence of 83% to 100% between the analyzes of the judges and the researchers. To evaluate significant differences in reports, McNemar's test was applied, using The SAS System for Windows software (version 9.2).

3 Results

In this study, social self-regulation strategies were analyzed through a pre-test and a post-test, with the objective of evaluating changes in the teachers' report of use of strategies after the intervention. Next, the results of the pre-test will be presented, followed by the results of the post-test. Table 1, presented below, shows the teachers' responses, followed by the absolute and relative frequencies (%) of the responses.

Table 1 – Social self-regulation strategies to ask for help, study and better learn content

Categories	n = 14						
	Pre-Test		Post-Test		McNemar		
	Attd	%	Attd.	%	S	DF	p
Studying alone	7	50	8	57.14	0,68	1	0,41
Ask the tutor for help	3	21.43	4	28.57	0,14	1	0,71
Chat with coworkers to ask questions	2	14.29	2	14.29	0.00	1	1.00
Study in a group	2	14.29	2	14.29	0.00	1	1.00
Discuss with friends	2	14.29	-	-	2.00	1	0,16
Ask questions in the WhatsApp group	0	0	2	14.29	2.00	1	0,15

Source: The authors.

In the pre-test, 16 mentions of social self-regulation learning strategies were identified, while this number rose to 18 mentions in the post-test. As shown in Table 1, among the social self-regulation strategies related to asking for help, studying and improving the learning of a content, teachers pointed to studying alone as the most used (*fr post*=57.14%), followed by asking the teacher for help (*fr post*=28.57%), talking to co-workers to ask questions (*fr post*=14.29%), studying in a group (*fr post*=14.29%) and asking questions in the WhatsApp group (*fr post*=14.29%).

As in the pre-test, studying alone remained the most adopted strategy (*fr pre*=50% and *fr post*=57.14%). Asking the teacher for help also had an increase in the relative frequency from pre-test to post-test (*fr pre*=21.43% and *fr post*=28.57%), although this difference is not statistically significant. The strategies of talking to co-workers to ask questions (*fr pre*=14.29% and *fr post*=14.29%) and study in groups (*fr pre*=14.29% and *fr post*=14.29%) kept their relative frequencies unchanged. The strategy of discussing with friends, which appeared in the pre-test, did not emerge in the post-test; on the other hand, it is possible to observe that the strategy of asking questions in the WhatsApp group appeared only in the post-test.

4 Discussion

The results of this research reveal significant insights into teachers' use of social self-regulation strategies during the Covid-19 pandemic. The strategy of studying alone,

which remained the most reported, both in the pre-test and in the post-test, can be attributed to social distancing measures that limited face-to-face interaction. According to Bandura (1991, 2018) and Romero-Ayuso *et al.* (2022), self-regulation is crucial for the management of actions and behaviors in response to internal and external stimuli. The results reinforce the importance of encouraging teachers' continuing education to promote social self-regulation strategies, helping them to develop effective teaching methods and emotional support, even in restrictive contexts. The pandemic forced teachers to take a more independent approach due to restrictions on social interaction, reflecting an adaptation to new teaching and learning conditions.

The emergence of the strategy of answering questions in the WhatsApp group in the post-test indicates an innovative adaptation to the use of digital technologies to overcome communication barriers imposed by remote teaching. The use of WhatsApp as a support tool demonstrates how continuing education can promote teachers' digital adaptation and flexibility, offering resources to maintain support and collaboration. The use of WhatsApp as a tool for immediate support and interaction between colleagues is in line with the perspective that social self-regulation strategies involve the application of behavioral adjustment processes in collective contexts (Warschburger *et al.*, 2023). This phenomenon demonstrates how teachers were able to integrate digital technologies to maintain mutual support and communication, key aspects for academic success and emotional well-being, as suggested by Ezmeci, Parpucu and Akman (2022).

Social self-regulation strategies, such as studying in groups and asking questions with colleagues, did not show a significant increase in the post-test. This constancy can be attributed to the restrictions imposed by the pandemic, which limited the opportunities for face-to-face interactions and, consequently, the effective use of these strategies. Toyokawa, Whalen and Laland (2019) argue that social learning strategies, such as group study, are essential for strengthening learning, as they promote the exchange of knowledge and the collective construction of knowledge. In the pandemic context, the lack of face-to-face meetings made this collaborative dynamic difficult, which may have limited the effectiveness of these practices.

The constancy in the relative frequencies of the strategies of group study and discussing with colleagues can be attributed to the limitations imposed by the pandemic, which significantly reduced the opportunities for face-to-face interactions. The literature

supports the idea that group study can enrich understanding and information retention, as highlighted by Panadero *et al.* (2015). However, the effectiveness of this strategy was limited due to physical interaction restrictions, reflecting the difficulties faced by teachers to fully adopt collaborative practices during remote teaching (Fernandez-Rio *et al.*, 2017; Järvelä; Järvenoja, 2011).

The small increase in the frequency of requests for teacher help suggests that even in a remote teaching context, educators continued to seek direct support to overcome specific challenges. This observation is in line with the importance of social self-regulation strategies to promote collaboration and mutual support (Amerstorfer; Münster-Kistner, 2021). The pandemic highlighted the need for continuous and adjusted support, as evidenced by the increase in the use of WhatsApp to answer questions and promote interactions, a reflection of the limitations faced in face-to-face interaction and group discussions. The limitation of face-to-face contact during the pandemic made it difficult to carry out collaborative activities and develop effective social strategies (Bahtiar *et al.*, 2022). The logistics of gathering groups at compatible times and in suitable environments is complex, resulting in an unsatisfactory implementation of these practices (Forsell *et al.*, 2021; Thornhill-Miller *et al.*, 2023).

The research findings corroborate previous studies that point to the preference for individualized study strategies during periods of social isolation (Ateş, 2022; Mammadov; Schroeder, 2023; Muwonge *et al.*, 2020). This trend reinforces the need to reassess and adapt educational interventions to better meet the demands of different contexts, such as distance learning, ensuring the effectiveness of social self-regulation strategies. Adaptation and innovation in pedagogical practices will be essential to overcome challenges and create collaborative and effective learning environments, benefiting both teachers and students in the future.

5 Final Considerations

This study aimed to analyze the effects of an intervention on the use of social self-regulation strategies by high school teachers, especially in the context of remote teaching imposed by the Covid-19 pandemic. The main results revealed that there were no statistically significant changes after the intervention. Studying alone remained the most

adopted strategy in both the pre-test and post-test. In addition, new strategies emerged, such as the use of WhatsApp to answer questions, highlighting teachers' adaptation to remote teaching conditions and their ability to integrate digital technologies to maintain communication and mutual support.

Among the limitations of this study, the absence of a larger and more diverse sample stands out, which could provide a broader view of the social self-regulation strategies used by teachers in different contexts. In addition, the intervention did not exclusively address social self-regulation strategies during the sessions, which may have limited the impact of the observed changes. The restriction to remote teaching also influenced the potential for collaborative interaction among participants, limiting the effectiveness of the social strategies analyzed.

The importance of continuing education for the promotion of social self-regulation strategies is highlighted, since such strategies can provide teachers with important resources to deal with the collaborative and challenging dynamics of different teaching contexts. The results of this research contribute to the understanding of the impacts that educational interventions can have on the development of these skills among educators, suggesting that continuing education has the potential to improve the use of self-regulatory strategies, especially in remote and hybrid teaching situations.

For future research, it is suggested to explore more robust and diversified interventions that consider different educational contexts, such as hybrid or face-to-face teaching, to better understand the dynamics of social self-regulation. Future studies could also investigate the impact of different forms of digital support and its consequences for social self-regulation, deepening knowledge about how teachers can effectively adapt to different teaching environments.

In conclusion, this study reinforces the importance of social self-regulation in the educational context, especially during challenging situations such as the Covid-19 pandemic. The research highlights the need to reassess and adapt pedagogical strategies to ensure that both teachers and students can fully benefit from collaborative practices, even in restricted environments. Continued development of self-regulatory strategies, adjusted to emerging technological and social realities, will be key to creating more resilient and effective learning environments in the future.

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