


Article

Teacher Self-Regulation and Its Relationship with Student Self-Regulation in Secondary Education

Fabiola Sáez-Delgado ^{1,*}, Yaranay López-Angulo ², Javier Mella-Norambuena ³, Catherine Baeza-Sepúlveda ⁴, Carolina Contreras-Saavedra ⁵  and Gisela Lozano-Peña ⁵

¹ Centro de Investigación en Educación y Desarrollo (CIEDE), Facultad de Educación, Universidad Católica de la Santísima Concepción, Concepción 4330000, Chile

² Departamento de Psicología, Facultad de Ciencias Sociales, Universidad de Concepción, Concepción 4330000, Chile

³ Departamento de Ciencias, Universidad Técnica Federico Santa María, Concepción 4330000, Chile

⁴ Programa de Magister en Ciencias de la Educación, Facultad de Educación, Universidad Católica de la Santísima Concepción, Concepción 4330000, Chile

⁵ Programa de Doctorado en Educación, Facultad de Educación, Universidad Católica de la Santísima Concepción, Concepción 4330000, Chile

* Correspondence: fsaez@ucsc.cl or saezfabiola24@gmail.com



Citation: Sáez-Delgado, F.; López-Angulo, Y.; Mella-Norambuena, J.; Baeza-Sepúlveda, C.; Contreras-Saavedra, C.; Lozano-Peña, G. Teacher Self-Regulation and Its Relationship with Student Self-Regulation in Secondary Education. *Sustainability* **2022**, *14*, 16863. <https://doi.org/10.3390/su142416863>

Academic Editors: Ana B. Bernardo, Adrian Castro-Lopez, Leandro Silva Almeida and Silvia Fernández Rivas

Received: 21 November 2022

Accepted: 13 December 2022

Published: 15 December 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Abstract: Self-regulation is relevant to understanding the teaching–learning process; however, few studies have focused on teachers' self-regulatory processes. The aim of this study was to characterize and analyze the relationship between teachers' and students' self-regulation. The design was cross-sectional and correlational. The sample consisted of 1481 participants (students $n = 1123$ and teachers $n = 358$) from 25 secondary schools in 17 cities of the Biobío region of Chile. In students, self-regulatory strategies were found to be deployed only half of the time; women were more self-regulated, and there was no difference in the levels of self-regulation according to grade. Teachers, it was found, almost always self-regulate their teaching, and the variables that influence their self-regulation are motivation, gender, and age, explaining between 25% and 28% of the variance. Positive and small correlations were evidenced between teacher role disposition with learning performance ($\rho = 0.10$, $p < 0.05$) and teacher role self-evaluation with both learning performance and self-evaluation of learning in their students ($\rho = 0.12$, $p < 0.05$). This study provides relevant evidence and proposes changes that could have a positive impact on teacher training and improve current teaching–learning practices in Chile, which would contribute to the quality of education.

Keywords: teacher self-regulation; student self-regulation; secondary education; quantitative study

1. Introduction

Available evidence related to factors that impact academic success highlights the theory of self-regulated learning as a central element to understanding the different performance trajectories during the school stage [1,2]. It has even been shown that self-regulatory skills predict academic success when controlling for intelligence [3].

Particularly, the level of self-regulation of students in secondary education has become a central focus of attention since its relevance for successful academic performance has been confirmed [1,4]. It empowers students for the demands of higher education [5,6], it provides students with the fundamental competencies for lifelong learning [7], and it develops the ability to overcome learning difficulties arising from an unfavorable environment [8].

1.1. Background on Self-Regulation of Learning in Schools

SRL is defined as self-generated and student-directed thoughts, emotions, and behaviors that are cyclically adapted to achieve academic and personal goals [9]. SRL is an active, recurrent, critical, and reflective process, where students approach tasks in a

purposeful, strategic, and self-directed style, which contributes to the individual's sense of self-determined learning [10].

Although it is possible to identify different models of self-regulation, they share certain components and coincide in understanding SRL as a cyclical process which involves macro- and micro-phases in its development, highlighting three main phases: the first phase of disposition where the task is analyzed, the study is strategically planned, and motivational beliefs are deployed; a second phase of performance where the student performs the task and monitors and adjusts his strategies if necessary; and, finally, the evaluation phase where the student performs a self-evaluation of his results regulating and adapting strategies for next performances [11].

It has been widely demonstrated that self-regulated students achieve better academic performance [12–16], have better self-efficacy beliefs for the task [17] and intrinsic value motivational strategies [18], and demonstrate a goal-oriented approach to learning [19]. Self-regulated students are able to set goals proactively, monitor their learning intentionally, use study strategies effectively, respond to personal feedback adaptively, and reach goals more quickly, and they are also more motivated to maintain their efforts to learn [20]. In addition, research has shown that self-regulated learning also has positive effects on other variables, decreases academic stress, increases subjective well-being [21], and decreases behavioral problems [3].

Conversely, low self-regulation leads to unsatisfactory outcomes such as academic failure, e.g., repeating a course or achieving low final grades [22], failure to achieve the established learning demands of school [23], and making inexact self-assessments of performance that are consequently unlikely to be modified [24]. In this sense, it is of concern that secondary school students show inadequate levels of self-regulation [23]. Therefore, this metacognitive competence is seen as a key and determining factor for improving performance at the secondary-school academic level [2].

1.2. From Self-Regulation of Learning to Teacher Self-Regulation

Although there is empirical evidence focused on students' self-regulated learning, few studies have focused on teachers' self-regulatory processes considering that it is a central actor of the context and learning dynamics that happen in classrooms [25,26]. In this sense, specifically, the available research has focused on the epistemological beliefs that teachers have about SRL [27,28], knowledge about this competency [29], self-efficacy to instruct SRL in the classroom [30], teachers' beliefs about feedback practices in relation to self-regulation [31], assessment practices that help improve self-regulation [32], teachers' practices in specific disciplines or subjects [33], the potentiality of teachers' instruction in self-regulation [34], and direct or indirect instructional practices of teachers to drive the improvement of their students' self-regulation [35]. The emphasis of existing studies involving teachers has been on the different variables associated with promoting or fostering self-regulation in students and not on the level of self-regulation of the teachers themselves [35,36], and to a lesser extent on whether their level of self-regulation relates to the self-regulation of their students.

1.3. Self-Regulated Teachers

Just as self-regulation helps students take responsibility for their own learning, it can also be expected to help teachers in their own professional development. Teachers have to constantly deploy many strategies to achieve teaching goals [37].

Teacher self-regulation (TSR) refers to the teacher's own self-regulated strategies executed in the teaching environment to achieve the set pedagogical objectives [38]. Consequently, teacher self-regulation can be seen as an active process where teachers direct and maintain their metacognition, motivation, and strategies for effective instruction. This definition is consistent with Zimmerman's theoretical model of self-regulation of three cyclical moments corresponding to disposition, performance, and self-reflection [9]. That

is, for each teaching session, the teacher plans his class, executes the teaching–learning process, and concludes with an evaluation of his teaching [37].

In the disposition phase, which includes processes necessary for the preparation of the action, teachers establish specific objectives to be achieved by the end of a class. Based on the objectives and considering the nature of the content, the characteristics of students, and the available resources, teachers select the appropriate instructional methods. Teachers need to apply many strategies to achieve the pedagogical objectives and, therefore, they need to self-regulate their teaching and maintain high levels of professional motivation [39].

Self-regulated teachers evaluate the effectiveness of their instruction based on comparison to their previous performances, student feedback, and whether or not the goals set at the beginning of the class were achieved. As a result of these evaluation processes, they develop behavioral, cognitive, and affective responses that will influence future action, planning, and execution processes in a cyclical manner. The literature describes that effective teachers are those who achieve self-regulation processes of their teaching, which can stimulate their beliefs to select appropriate actions that lead to the successful execution of their tasks and professional performance [37]. Thus, a self-regulated teacher is aware of why, when, where, and how pedagogical knowledge and skills can be learned and applied in the classroom. Teachers also have a strong sense of personal responsibility for their teaching; they exercise metacognitive control of continuous reflection on their pedagogical practices and the effort deployed to meet challenges [40]. Self-regulated teachers exhibit adequate functioning in the teaching exercise, and they build knowledge before and after the teaching session through cyclical self-regulatory processes that allow them to improve with each class [37].

1.4. The Present Study

Undoubtedly, promoting an autonomous learning model requires a corresponding teaching model, which consequently necessitates appropriate teachers of cognitive and meta-cognitive strategies in the service of teaching. Undoubtedly, promotion an autonomous learning model requires a corresponding teaching model, therefore, teachers are required to apply cognitive and metacognitive strategies during teaching [41]. First, teachers must be self-regulated, and then they need to learn how to effectively teach their students to self-regulate their study and learning processes [42].

Although self-regulation has been highlighted as an important part of a teacher's role in the school experience [43], the self-regulatory processes of teachers, and whether these are related to the regulatory processes of their students, are still unknown. In general, evidence on secondary-school teachers' self-regulation has been investigated from a qualitative approach [44], and in the case of quantitative studies, these have focused on adding elements for understanding self-regulatory factors that help explain variability in students' performance [45]. For example: the relationship between teachers' reflective practices, their self-regulation, and their teaching experience has been examined [46]; teachers' emotional regulation while teaching has been studied from their students' perceptions [47]; and the interrelationship between teacher self-regulation and teachers' knowledge for teaching has been explored [40]; however, a study examining teachers' self-regulation and their students' self-regulation has not been found. Although it has been argued that the construction of self-regulation includes steps, processes, and components that integrate and interact with each other, providing positive learning outcomes [48], there is little evidence of the interaction specifying relationships in teacher–student self-regulatory processes [49]. It is noted that this approach to the phenomenon is limited; therefore, studying how the learning process is related to the teaching process from the perspective of self-regulation has become a central concern in formal instructional situations [50]. Additionally, it is important to specify sociodemographic characteristics for an adequate inference of results.

Due to the background presented, this study aimed to respond to the theoretical and empirical gaps regarding teacher and student self-regulation, considering the importance

of these variables on the success of students' academic performance, in particular given that few investigations have included both participants. The specific research questions were:

- RQ1. Are there differences in the stages of self-regulation of learning in students according to gender and grade level?
- RQ2. Is there an association between teacher motivation and sociodemographic variables on teacher self-regulation phases?
- RQ3. Is there a relationship between students' self-regulation phases of learning and teachers' self-regulation phases?

2. Materials and Methods

The present study is based on the positivist paradigm, implementing a study with a quantitative approach and a cross-sectional, correlational design.

2.1. Participants

The sample consisted of students and teachers from public secondary schools in the Biobío region of Chile. The sampling was non-probabilistic, specifically "convenience sampling".

Specifically, the sample for objectives 1 and 2 was composed of 1123 students from 25 schools in 17 different cities, with a mean age of 15.42 years ($SD = 1.64$); 578 (51%) were women, 527 (47%) were men, and 18 (2%) preferred not to declare their gender. Regarding educational level, secondary education in Chile has a first, second, third, and fourth grade. Of the total, 319 students (28%) were in first grade, 419 (37%) were in second, 295 (26%) were in third, and 90 (8%) were in fourth. The sample of teachers was composed of 358 participants from 20 schools in 14 different cities, with a mean age of 39.08 years ($SD = 10.99$); 218 teachers (61%) were women, 139 (39%) were men, and 1 (0%) preferred not to declare their gender. In relation to work experience, the mean was 12.09 years ($SD = 10.14$) of experience, with respect to the type of employment contract: 241 teachers held permanent contracts, 112 teachers held fixed-term contracts, and 5 teachers held fee contracts. Regarding the workload, respondents had a mean of 39.84 hours ($SD = 6.68$) of contract per week.

Finally, to achieve the third objective of this study, the data of students and teachers who interacted with each other were cross-checked, and the teachers and their respective students were verified. For this objective, the sample of students was 721 participants with a mean age of 15.42 ($SD = 1.77$); 355 students (49%) were women, 353 (49%) were men, and 13 (2%) preferred not to declare their gender. The sample of teachers was 133 with a mean age of 38.43 years ($SD = 9.85$); 73 teachers (55%) were women, 59 (44%) were men, and 1 (1%) preferred not to declare their gender. Both teachers and students were from 12 schools in 10 different cities.

2.2. Instruments

2.2.1. Teacher Self-Regulation

The instruments to measure the teachers' self-regulation phases scale were designed and validated in the context of the FONDECYT Project 11201054-ANID-Chile. Based on an analysis of the literature and theory of teacher self-regulation [38,39,51,52], a first proposal of items was obtained. It then went through the process of validation by expert judges, followed by cognitive interviews and a pilot application for exploratory analysis. In this design and validation process, the international guidelines for test development in research were considered [53]. The result of this process concluded with an instrument of 3 scales: disposition, performance, and self-evaluation of teacher roles. Instrument dimensions were confirmed in this study. The teacher role disposition scale was composed of 5 items and measured the frequency with which teachers used self-regulatory strategies to prepare their teaching. An example item is, "I plan learning activities according to the needs of my students", and the internal consistency was adequate ($\alpha > 0.80$; $\Omega > 0.88$). The teacher role performance scale was composed of 5 items and measured the frequency with

which teachers used strategies to monitor their teaching. An example item is, “I monitor my teaching strategies used and adjust them if necessary”, and internal consistency was adequate ($\alpha > 0.84$; $\Omega > 0.86$). Finally, a teacher role self-evaluation scale was composed of 5 items and measured the frequency with which teachers reflect on the results obtained at the end of their academic processes. An example of this item is, “I self-evaluate whether my teaching practices were effective”, and internal consistency was adequate ($\alpha > 0.84$; $\Omega > 0.87$). For these three dimensions that make up the instrument, the response format was a 7-point Likert-type scale, where 1 is always, 2 is almost always, 3 is frequently, 4 is half the time, 5 is seldom, 6 is almost never, and 7 is never (See Appendix A). The instrument went through the process of evaluating its factorial structure by means of confirmatory factor analysis (CFA) where three models were tested: (1) a model of 3 independent factors; (2) a multilevel model of 3 factors and 1 of higher order; and (3) a multilevel model of 3 related factors and 1 of higher order. Of these models, the second one showed fit indices according to the fit indices proposed in the literature, i.e., an RMSEA ≤ 0.07 , the CFI and TLI > 0.92 , the SRMR < 0.08 [54], and the chi-squared [55] (see Table 1).

Table 1. Confirmatory factor analysis fit index of the teacher self-regulation instrument.

| Instrument | Model | X ² | CFI | TLI | RMSEA | SRMR | Estimator |
|------------|-------|----------------|-------|-------|-------|-------|-----------|
| TSR | 1 | 21,164.2 | 0.285 | 0.166 | 0.827 | 0.434 | DWLS |
| | 2 | 206.38 | 0.996 | 0.995 | 0.49 | 0.05 | DWLS |
| | 3 | 454.5 | 0.987 | 0.984 | 0.114 | 0.067 | DWLS |

Note. TSR: teacher self-regulation. X²: chi-square goodness-of-fit statistic. CFI: comparative fit index. TLI: Tucker-Lewis index. RMSEA: root mean square error of approximation. SRMR: standardized root mean square. DWLS: weighted least squares.

2.2.2. Teacher Motivation

A brief scale of teacher motivation was designed and validated in the context of the FONDECYT Project 11201054-ANID-Chile. It followed the same construction and validation process as the teacher self-regulation instrument. The unidimensional scale consisted of 5 items, and measured the intrinsic causes of teaching practices, an example of which is, “I am motivated to improve my teaching practices”, and the internal consistency was adequate ($\alpha > 0.87$; $\Omega > 0.90$). The response format is a 7-point Likert-type scale, where 1 is always, 2 is almost always, 3 is frequently, 4 is half the time, 5 is seldom, 6 is almost never, and 7 is never (See Appendix B). The instrument went through the process of evaluating its factorial structure by means of confirmatory factor analysis (CFA) where three models were tested: (1) a model of 3 independent factors; (2) a multilevel model of 3 factors and 1 of higher order; and (3) a multilevel model of 3 related factors and 1 of higher order. Of these models, the second one showed adequate fit indices according to the fit indices proposed in the literature, i.e., an RMSEA ≤ 0.07 , the CFI and TLI > 0.92 , the SRMR < 0.08 [54], and the chi-square [55] (see Table 2).

Table 2. Fit index of the confirmatory factor analysis of the teacher motivation instrument.

| Instrument | X ² | CFI | TLI | RMSEA | SRMR | Estimator |
|--------------------|----------------|-------|-------|-------|-------|-----------|
| Teacher motivation | 15.26 | 0.997 | 0.992 | 0.048 | 0.044 | DWLS |

Note: X²: chi-square goodness-of-fit statistic. CFI: comparative fit index. TLI: Tucker-Lewis index. RMSEA: root mean square error of approximation. SRMR: standardized root mean square. DWLS: weighted least squares.

2.2.3. Self-Regulation of Learning in Students

To assess self-regulation of learning, scales were used to measure the phases of the cyclical process of student self-regulation. The original version was created for secondary-school students in Ecuador [56] and then adapted and validated for Chilean students of the same academic level [57]. Both studies showed adequate psychometric properties. This instrument, in its original version validated in Chile, has 34 items in total which

are distributed in three scales consistent with the self-regulation process proposed by Zimmerman (2000) (disposition: 7 items; performance: 16 items; and self-evaluation: 11 items). However, in the present study, the decision was made to apply a new abbreviated version of the instrument. When changes were made to the scales, their psychometric properties were again studied in the context of the first stage of implementation of the FONDECYT 11,201,054 research project.

The adjusted instrument consisted of the same three subscales, but the number of items was reduced. The disposition learning scale was composed of 5 items and measured the frequency with which students use self-regulatory strategies to prepare their study, an example of which is, “Before starting to study, I make a schedule to organize my study time”, and internal consistency was adequate ($\alpha > 0.79$; $\Omega > 0.82$). The learning performance scale was composed of 6 items and measured the frequency with which students use strategies to monitor their study based on established pre-planning that includes the goals to be achieved, an example of which is, “While studying, I check if my strategies are effective and adjust them if necessary”, and internal consistency was adequate ($\alpha > 0.87$; $\Omega > 0.91$). Finally, the self-evaluation learning scale was composed of 5 items and measured the frequency with which students reflect on the results obtained in any school task or test, an example of which is, “When I finish my study, I self-evaluate whether I met my proposed goals”, and internal consistency was adequate ($\alpha > 0.85$; $\Omega > 0.87$). For these three dimensions that make up the instrument, the response format is a 7-point Likert-type scale, where 1 is always, 2 is almost always, 3 is frequently, 4 is half the time, 5 is seldom, 6 is almost never, and 7 is never (See Appendix C). In this study, the new version of the instrument went through the process of evaluating its factorial structure by means of confirmatory factor analysis (CFA) where a unifactorial model was tested and showed adequate fit indices (see Table 3).

Table 3. Fit index of the confirmatory factor analysis of self-regulation of the learning instrument.

| Instrument | Model | χ^2 | CFI | TLI | RMSEA | SRMR | Estimator |
|------------|-------|----------|-------|-------|-------|-------|-----------|
| SRL | 1 | 953.71 | 0.992 | 0.991 | 0.092 | 0.053 | DWLS |
| | 2 | 745.02 | 0.994 | 0.993 | 0.05 | 0.049 | DWLS |
| | 3 | 953.71 | 0.992 | 0.991 | 0.092 | 0.053 | DWLS |

Note: SRL: self-regulation of learning. χ^2 : chi-square goodness-of-fit statistic. CFI: comparative fit index. TLI: Tucker-Lewis index. RMSEA: root mean square error of approximation. SRMR: standardized root mean square. DWLS: weighted least squares.

2.3. Data Collection Procedure

All procedures followed the ethical guidelines for research with human subjects. The research was approved by the Ethics and Bioethics Committee of the Universidad Católica de la Santísima Concepción. Specifically, the procedures were as follows: (a) meetings were coordinated with the directors of the Municipal Education Administration Departments (DAEMs) responsible for public schools in cities belonging to the Biobío region in Chile, and directors were asked for authorization to conduct the study; (b) then a meeting was coordinated with the directors of each secondary school, and an invitation was extended for their participation; (c) after that, a meeting was coordinated with the management team of the participating schools to invite teachers, students, and their parents to participate, as well as to send links to the surveys for teachers and students, and in the case of parents, to send a link to read and review the informed consent form. In the case of teachers and students, the link was sent in its first section, and before answering the scales, they had to answer an informed consent and assent, respectively; (d) the instruments were applied in the first academic semester of 2022 (between March and June).

The links were generated in the SurveyMonkey technological tool. Once the data collection process was completed, the responses were downloaded into an Excel spreadsheet for data analysis preparation. A data collection protocol was standardized for all schools, following similar procedures for both teachers and students. Finally, activities were carried

out to benefit the participating schools. These consisted of the presentation of a global report of the results and a workshop on topics agreed upon with the school's management team; in all the schools The workshops dealt with the socioemotional competencies of the teachers.

2.4. Data Analysis Procedure

In order to respond to the first objective of this study, which referred to the evaluation of differences in the phases of self-regulation of learning according to gender and level (grade) in students, a two-way ANOVA analysis was proposed [58]. Prior to its performance, it was verified that there were no extreme outliers, and then the assumption of normality was evaluated for the distribution of each variable according to comparable groups. For this, the Kolmogorov–Smirnov test was used with Lilliefors coding [59]. Then the assumption of homogeneity of variance was evaluated; for this purpose, the Levene test was used [60].

To respond to the second objective of this study, referred to as the association that sociodemographic variables (age, gender, years of teaching experience, type of employment contract, workload, and teaching discipline) and teacher motivation have on the phases of self-regulation of teaching work, multiple linear regressions were proposed for the selection of variables. The mixed stepwise method was used to test the fit of the models; normality of the residuals was evaluated with the Kolmogorov–Smirnov test with the Lilliefors modification; then homoscedasticity of the residuals was evaluated using the Breusch–Pagan test [61]; multicollinearity was evaluated using the variance inflation factor (VIF) [62]; and finally, autocorrelation was evaluated using the Durbin–Watson test [63].

To respond to the third objective of this study, referred to as the relationship between phases of self-regulation of student learning with phases of self-regulation of teaching, first the normality in the distribution of data in each variable was evaluated. For this, the Kolmogorov–Smirnov test with the Lilliefors modification was used; because in all cases it was not possible to assume normality in distribution of data, Spearman's correlation test was performed.

Non-representative groups were excluded from the analysis. Specifically, in the case of RQ1 that incorporated the gender variable, people who preferred not to declare gender were excluded from the analysis because of their low representation ($n = 18$). All analyses were performed in RStudio version 4.2.2.

3. Results

3.1. Results of Objective 1: Evaluation of Differences in Students According to Gender and Grade for Each SRL Phase (RQ1)

To evaluate differences in phases of SRL in students according to gender and school level, the two-way ANOVA assumptions were reviewed. The review of outliers showed that for the disposition phase there were seven outliers and for the performance and self-evaluation phases there were five outliers each, but in all these cases none was an extreme outlier. Then, normality in the distribution of the data was checked for each group to be compared, and the Kolmogorov–Smirnov test with the Lilliefors modification was applied. In the group of fourth-grade men, it was possible to assume normality in the disposition ($W = 0.98, p = 0.59$) and performance ($W = 0.97, p = 0.25$) phases. In the case of the self-evaluation phase, the groups of fourth-grade men, $W = 0.97, p = 0.36$, and fourth-grade women, $W = 0.95, p = 0.06$, could be assumed normal. Then, the homogeneity of variances was evaluated using Levene's test. The disposition phase showed $F(7.1097) = 0.87, p = 0.53$; the performance phase showed $F(7.1097) = 0.96, p = 0.46$; and the self-evaluation phase showed $F(7.1097) = 1.69, p = 0.11$; therefore, in all three phases homogeneity of variance could be assumed.

In relation to the means of the phases of self-regulation of learning in students, it could be observed that, for each of the phases of disposition, performance, and self-evaluation, women had higher scores than men, the highest mean for women being in the disposition

phase ($M = 4.87$), while for men the lowest mean was for the self-evaluation phase ($M = 4.12$) (see Table 4).

Table 4. Descriptive statistics of self-regulation of learning in students according to gender.

| Gender | N | Disposition | | Performance | | Self-Evaluation | |
|--------|-----|-------------|------|-------------|------|-----------------|------|
| | | Mean | SD | Mean | SD | Mean | SD |
| Men | 527 | 4.44 | 1.48 | 4.44 | 1.55 | 4.12 | 1.61 |
| Women | 578 | 4.87 | 1.41 | 4.79 | 1.52 | 4.40 | 1.62 |

Note: SD: standard deviation.

Regarding the descriptive analysis considering gender and grade, the mean for women is higher for all phases of self-regulation, with women in the fourth grade of secondary school having the mean average ($M = 4.68$ and $M = 5.05$); see Table 5.

Table 5. Descriptive statistics of student self-regulation according to gender and grade.

| Grade | Gender | N | Disposition | | Performance | | Self-Evaluation | |
|--------|--------|-----|-------------|------|-------------|------|-----------------|------|
| | | | Mean | SD | Mean | SD | Mean | SD |
| First | Men | 142 | 4.55 | 1.44 | 4.57 | 1.47 | 4.23 | 1.53 |
| First | Women | 173 | 5.00 | 1.39 | 4.94 | 1.43 | 4.62 | 1.51 |
| Second | Men | 197 | 4.35 | 1.56 | 4.39 | 1.63 | 4.08 | 1.74 |
| Second | Women | 214 | 4.80 | 1.36 | 4.62 | 1.56 | 4.17 | 1.64 |
| Third | Men | 141 | 4.49 | 1.47 | 4.41 | 1.55 | 4.10 | 1.58 |
| Third | Women | 153 | 4.78 | 1.42 | 4.81 | 1.56 | 4.41 | 1.66 |
| Fourth | Men | 47 | 4.35 | 1.33 | 4.27 | 1.49 | 3.99 | 1.41 |
| Fourth | Women | 38 | 5.03 | 1.66 | 5.05 | 1.55 | 4.68 | 1.71 |

Note: SD: standard deviation.

Regarding the inferential analysis used to determine differences between groups, the two-factor ANOVA for disposition to learn showed that only the effect of gender was significant $F(1.1097) = 28.81$, $p < 0.05$. With this result, we proceeded to perform a T-test to analyze disposition to learning according to gender, which was significant $T(1080.4) = 4.917$, $p < 0.001$, $d = 0.30$. Therefore, it can be assumed that women have a significantly higher mean in their disposition to learn compared to men.

The two-factor ANOVA for the performance of learning also showed that only the effect of gender was significant $F(1.1097) = 14.6$, $p < 0.001$. With this result, the T-test was applied to the performance phase according to gender. The test was significant $T(1089.8) = 3.87$, $p < 0.001$, $d = 0.23$; therefore, it can be assumed that women have a significantly higher mean in the performance phase compared to men.

The two-factor ANOVA for the self-evaluation phase of learning also showed that only the effect of gender was significant $F(1.1097) = 8.39$, $p < 0.01$. Then a T-test was applied that was significant $T(1094.5) = 2.94$, $p < 0.01$, $d = 0.18$. Therefore, it can be assumed that women have significantly higher means for the self-evaluation phase of learning compared to men.

Finally, it can be stated that none of the phases of self-regulation of learning varied as a function of the participants' school level (see Table 6).

3.2. Results of Objective 2: Evaluation of the Association between Teacher Motivation and Sociodemographic Variables on TSR Phases

In relation to the means of TSR phases, it was observed that, as in the case of students, women teachers had higher average scores for phases of disposition, performance, and self-evaluation, with the highest mean for women being in the disposition phase ($M = 6.15$) and, on the contrary, the lowest mean for men being in the self-evaluation phase ($M = 5.77$) (see Table 7).

Table 6. Results of the two-way ANOVA analysis on differences in student self-regulation according to gender and grade level.

| Differences by Grade and Gender for the Learning Disposition Phase | | | | | | | |
|---|---------------|-----|------|--------|-----------------------|----------|-------|
| | Effect | DFn | DFd | F | p | p < 0.05 | Ges |
| 1 | gender | 1 | 1097 | 23.813 | 1.22×10^{-6} | * | 0.021 |
| 2 | grade | 3 | 1097 | 1.223 | 0.30 | | 0.003 |
| 3 | gender: grade | 3 | 1097 | 0.441 | 0.72 | | 0.001 |
| Differences by grade and gender for the learning performance phase | | | | | | | |
| 1 | gender | 1 | 1097 | 14.602 | 0.00014 | * | 0.013 |
| 2 | grade | 3 | 1097 | 1.599 | 0.18800 | | 0.004 |
| 3 | gender: grade | 3 | 1097 | 0.780 | 0.50500 | | 0.002 |
| Differences by grade and gender for the self-evaluation phase of learning | | | | | | | |
| 1 | gender | 1 | 1097 | 8.388 | 0.004 | * | 0.008 |
| 2 | grade | 3 | 1097 | 2.233 | 0.083 | | 0.006 |
| 3 | gender: grade | 3 | 1097 | 0.994 | 0.395 | | 0.003 |

Note: * $p < 0.05$.**Table 7.** Descriptive statistics of teachers' self-regulation phases according to gender.

| Gender | N | Disposition | | Performance | | Self-Evaluation | |
|--------|-----|-------------|------|-------------|------|-----------------|------|
| | | Mean | SD | Mean | SD | Mean | SD |
| Men | 139 | 5.80 | 0.90 | 5.89 | 0.92 | 5.77 | 0.99 |
| Women | 218 | 6.15 | 0.69 | 6.07 | 0.80 | 6.07 | 0.79 |

Note: SD: standard deviation.

3.3. Association between Teacher Motivation and Sociodemographic Variables in the Teacher Role Disposition Phase (RQ2)

To evaluate the association between teacher motivation and sociodemographic variables in the teacher role disposition phase, a multiple linear regression model was utilized. The model generated using the mixed stepwise method was as follows:

$$formula = disposition \sim motivation + gender + age$$

The model was significant, $F(3.353) = 21.45$, $p < 0.001$, $R^2 = 0.15$. Next, the normality of the residuals was evaluated, which was significant, $D = 0.08$, $p < 0.001$, so normality of the residuals could not be assumed. Next, the homoscedasticity of the residuals was evaluated, which was significant, $BP(8) = 41.53$, $p < 0.001$; therefore, constant variability of the residuals cannot be assumed. Next, multicollinearity was evaluated, with the variable "gender", $vif = 1.01$, being the highest value. Finally, autocorrelation was evaluated, which was not significant, $DW = 2.11$, $p = 0.31$, so we assume that there is no autocorrelation in the model. Considering that the first model generated did not comply with some of the assumptions, we proceeded to incorporate a motivation variable as a polynomial, given that the visual inspection of the relationship between this variable and the teacher role disposition phase did not follow a linear relationship. The formula of the model was as follows:

$$formula = disposition \sim poly(motivation, 2) + gender + age$$

The model was significant, $F(4.352) = 30.02$, $p < 0.001$, $R^2 = 0.25$, being a model that improves the R^2 . To confirm this improvement, the BIC was used, $M1 \text{ BIC}(5) = 823.05$, $M2 \text{ BIC}(6) = 783.92$, which confirmed the improvement of the model. Then, the assumptions were evaluated, and the normality of the residuals was significant, $D = 0.09$, $p < 0.001$. The homoscedasticity test was significant, $BP(4) = 25.25$, $p < 0.001$, and the VIF values were between 1.01 and 1.04, so they were acceptable. Finally, the autocorrelation, $DW = 2.10$, $p = 0.36$, was evaluated; it was not significant. With this background and a visual inspection of waste distribution, this is considered a good model for high levels of disposal; this may be because data of this variable present significant skewing to the left. Therefore, the

results show that, for the teacher role disposition phase, the variables that have a significant influence are motivation, gender, and age, explaining 25% of the variance (see Table 8).

Table 8. Regression models on variables that influence the phases of teacher self-regulation.

| Predictor | <i>b</i> | <i>b</i> 95% CI (LL, UL) | <i>sr</i> | <i>sr</i> ² 95% CI (LL, UL) | Fit |
|---|----------|-----------------------------|-----------|--|---|
| Regression model for teacher role disposition phase | | | | | |
| (Intercept) | 5.55 ** | (5.25, 5.84) | | | |
| poly(motivation, 2)1 | 4.77 ** | (3.39, 6.14) | 0.10 | (0.04, 0.15) | |
| poly(motivation, 2)2 | 4.83 ** | (3.45, 6.22) | 0.10 | (0.05, 0.15) | |
| gender (women) | 0.24 ** | (0.09, 0.39) | 0.02 | (−0.01, 0.05) | |
| age | 0.01 * | (0.00, 0.02) | 0.01 | (−0.01, 0.03) | |
| | | | | | R2 = 0.254 ** 95% CI (0.17, 0.32) |
| Regression model for teacher role performance phase | | | | | |
| (Intercept) | 6.01 ** | (5.93, 6.08) | | | |
| poly(motivation, 3)1 | 6.55 ** | (5.11, 7.99) | 0.16 | (0.10, 0.23) | |
| poly(motivation, 3)2 | 5.25 ** | (3.81, 6.70) | 0.11 | (0.05, 0.16) | |
| | | | | | R2 = 0.275 ** 95% CI (0.20, 0.34) |
| Regression model for teacher role self-evaluation phase | | | | | |
| (Intercept) | 5.45 * | (5.12, 5.78) | | | |
| poly(motivation, 3)1 | 5.83 ** | (4.30, 7.36) | 0.12 | (0.06, 0.18) | |
| poly(motivation, 3)2 | 4.77 ** | (3.23, 6.31) | 0.08 | (0.03, 0.13) | |
| poly(motivation, 3)3 | 1.97 * | (0.44, 3.49) | 0.01 | (−0.01, 0.03) | |
| gender (women) | 0.19 * | (0.02, 0.36) | 0.01 | (−0.01, 0.03) | |
| age | 0.01 ** | (0.00, 0.02) | 0.01 | (−0.01, 0.04) | |
| | | | | | R2 = 0.254 ** 95% CI (0.17, 0.32) |

Note: a significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. *sr*² represents the semi-partial correlation squared. LL and UL indicate the lower and upper limits of a confidence interval (CI), respectively. * indicates $p < 0.05$. ** indicates $p < 0.01$.

3.4. Association between Teacher Motivation and Sociodemographic Variables on the Teacher Role Performance Phase (RQ2)

To evaluate the association between teacher motivation and sociodemographic variables on the teacher role performance phase, a multiple linear regression model was utilized. The model generated using the mixed stepwise method was as follows:

$$\text{formula} = \text{performance} \sim \text{motivation} + \text{workload}$$

The model was significant, $F(2.354) = 36.11$, $p < 0.001$, $R^2 = 0.16$. The normality of the residuals was evaluated, and the resulting test was significant, $D = 0.08$, $p < 0.001$, so normality could not be assumed. Next, the homoscedasticity of the residuals was evaluated, which was significant, $BP(2) = 29.58$, $p < 0.001$, and the variance inflation factor (VIF) for each predictor was $vif = 1.01$ for the two variables. Finally, the autocorrelation test was not significant, $DW = 2.13$, $p = 0.19$, so it was assumed that there is no autocorrelation in the model.

Considering that the first model generated did not comply with some of the assumptions, we proceeded to incorporate the polynomial of the motivation variable. With this modification, workload was no longer significant, leaving a simple linear regression model. The resulting model was as follows:

$$\text{formula} = \text{performance} \sim \text{poly}(\text{motivation}, 2)$$

The model was significant, $F(3.353) = 44.58$, $p < 0.001$, $R^2 = 0.27$, being a model that improves the R^2 . To confirm this improvement, the BIC was used, M1 BIC (4) = 860.53, M2 BIC(5) = 818.01; therefore, model improvement was confirmed. Then, assumptions were evaluated, and the normality of the residuals was significant, $D = 0.09$, $p < 0.001$. The homoscedasticity test was not significant, $BP(3) = 7.85$, $p = 0.05$, and finally the autocorrelation was evaluated with the Durbin–Watson test, $DW = 2.12$, $p = 0.22$, which was not significant. With this background and a visual inspection of the distribution of the residuals, this is considered a good model for high levels of performance; this may

be because the data of this variable present significant skewing to the left. Therefore, the results show that only the motivation variable was associated with teacher role performance, explaining 28% of the variance (see Table 8).

3.5. Association between Teacher Motivation and Sociodemographic Variables on the Teacher Role Self-Evaluation Phase (RQ2)

To evaluate the association between teacher role motivation and sociodemographic variables on the teacher role self-evaluation phase, a multiple linear regression model was utilized. The model generated using the mixed stepwise method was as follows:

$$\text{formula} = \text{self-evaluation} \sim \text{motivation} + \text{gender} + \text{age} + \text{workload}$$

The model was significant, $F(4.352) = 17.8$, $p < 0.001$, $R^2 = 0.16$, and the test for normality of the residuals was significant, $D = 0.07$, $p < 0.001$; therefore, normality of the residuals cannot be assumed. The results of the homoscedasticity test of the residuals were significant, $BP(4) = 16.30$, $p < 0.01$; therefore, constant variability of the residuals cannot be assumed. Regarding variance inflation (VIF) all predictors presented a VIF between 1.01 and 1.03. Finally, autocorrelation was tested, which was not significant, $DW = 2.15$, $p = 0.93$, so it was assumed that there is no autocorrelation in the model.

Considering that the first model generated did not comply with some of the assumptions, we proceeded to incorporate the polynomial of the motivation variable. With this modification, workload was no longer significant, so it was eliminated from the model. The formula was as follows:

$$\text{formula} = \text{self-evaluation} \sim \text{poly}(\text{mot}, 3) + \text{gender} + \text{age}$$

The model was significant, $F(5.351) = 23.95$, $p < 0.001$, $R^2 = 0.25$, being a model that improves the R^2 . To confirm this improvement, the BIC was used, $M1 \text{ BIC}(6) = 899.37$, $M2 \text{ BIC}(7) = 866.21$; therefore, the improvement in the model was confirmed. The normality test of the residuals was significant, $D = 0.08$, $p < 0.001$; the homoscedasticity test was not significant, $BP(5) = 7.47$, $p = 0.19$; the variance inflation factor (VIF) for all variables took values between 1.01 and 1.04; and finally, the autocorrelation $DW = 2.10$, $p = 0.84$ was evaluated, which was not significant. With this background and a visual inspection of the distribution of the residuals, this is considered a good model for high levels of execution; this may be because the data of this variable present significant skewing to the left. Therefore, the results show that, for the self-evaluation of the teacher role, the variables that have a significant influence are motivation, gender, and age, explaining 25% of the variance (see Table 8).

3.6. Result of Objective 3: Evaluation of the Relationship between TSR Phases with SRL Phases (RQ3)

In order to respond to the third objective of this study, a descriptive analysis of the variables of interest was first carried out, where it can be observed that the means of the teachers are higher than those of the students; for teachers, the performance phase had the highest mean ($M = 6.13$) and the self-evaluation phase the lowest ($M = 6.07$). On the other hand, for students the disposition phase presented the highest mean ($M = 4.68$) and the self-evaluation phase ($M = 4.25$) the lowest. That is, teachers self-report that they almost always implement strategies for self-regulation of their teaching, while students deploy self-regulatory study strategies half of the time (See Table 9).

Finally, to evaluate the correlation between TSR phases and SRL phases, the assumptions of normality were first verified for all variables. In all cases, the Kolmogorov–Smirnov test was significant, so Spearman's correlation test was performed.

Table 10 shows that there are positive and small significant correlations between the teacher role disposition with learning performance ($\rho = 0.010$, $p < 0.05$) and the teacher

role self-evaluation with learning performance scale, and with self-evaluation of study in their students ($\rho = 0.12$, $p < 0.05$).

Table 9. Descriptive analysis of the phases of self-regulation in teachers and students.

| | | Mean | SD | Median | Min | Max | Skew | Kurtosis | K-S Lilliefors |
|-----|-----------------|------|------|--------|------|------|-------|----------|----------------|
| SRL | Disposition | 4.68 | 1.43 | 4.80 | 1.00 | 7.00 | −0.39 | −0.25 | D = 0.06 *** |
| | Performance | 4.62 | 1.50 | 4.67 | 1.00 | 7.00 | −0.40 | −0.45 | D = 0.07 *** |
| | Self-evaluation | 4.25 | 1.56 | 4.20 | 1.00 | 7.00 | −0.09 | −0.72 | D = 0.06 *** |
| TSR | Disposition | 6.10 | 0.79 | 6.40 | 3.00 | 7.00 | −1.41 | 2.03 | D = 0.18 *** |
| | Performance | 6.13 | 0.84 | 6.40 | 3.60 | 7.00 | −1.13 | 0.90 | D = 0.15 *** |
| | Self-evaluation | 6.07 | 0.92 | 6.20 | 2.80 | 7.00 | −1.37 | 2.06 | D = 0.16 *** |

Note: TSR: teacher self-regulation; SRL: self-regulation of learning; SD: standard deviation. *** indicates $p < 0.001$.

Table 10. Correlation analysis between TSR phases with SRL phases.

| | Variable | M | SD | 1 | 2 | 3 | 4 | 5 |
|-----|-----------------------------------|------|------|----------|----------|--------|----------|----------|
| SRL | 1. Disposition for learning | 4.68 | 1.43 | | | | | |
| | 2. Learning performance | 4.62 | 1.50 | 0.84 *** | | | | |
| | 3. Self-evaluation of learning | 4.25 | 1.56 | 0.76 *** | 0.84 *** | | | |
| | 4. Teacher role disposition scale | 6.10 | 0.79 | 0.05 | 0.10 * | 0.06 | | |
| TSR | 5. Teacher role performance | 6.13 | 0.84 | 0.05 | 0.06 | 0.07 | 0.83 *** | |
| | 6. Teacher role self-evaluation | 6.07 | 0.92 | 0.05 | 0.12 * | 0.12 * | 0.75 *** | 0.86 *** |

Note: M and SD are used to represent mean and standard deviation, respectively. * indicates $p < 0.05$. *** indicates $p < 0.001$. TSR: teacher self-regulation. SRL: self-regulation of learning.

4. Discussion

This section presents a discussion of findings of the study, reflects on the importance of self-regulatory processes in students and teachers to contribute to educational quality, and specifies limitations and future research.

4.1. RQ1 Discussion: Differences in Students According to Gender and Grade for the SRL Phases

The results for students revealed that only “half of the time” do they deploy self-regulatory strategies to study and learn. It was evident that students do not plan, monitor, and self-evaluate their study as necessary to successfully meet academic demands. Fortunately, research has pointed out that, although we talk about self-regulated subjects as states of the student, they are not genetically based characteristics or personality traits over which the individual has no control, but rather the result of psychosocial processes; therefore, it is multifactorial at the intrapersonal and interpersonal level of interaction of individual variables as well as contextual variables [64]. Among the students’ own variables can be considered, for example, age, gender, ethnicity, and prior knowledge, while among the contextual variables can be considered teachers’ instructional methods, activities, interactions, and classroom dynamics; therefore, self-regulation is not only allowed or limited by personal cognition and motivation, but is also privileged, encouraged, or discouraged by contextual factors [65]. Thus, it can be understood that self-regulation is a dynamic and interactive process, which could be affected by daily instruction and practice through multiple experiences in different contexts [66].

In students, the results showed that women are more self-regulated than men, given that in all self-regulatory processes including disposition, performance, and self-evaluation they had significantly higher means. An investigation of Mexican students found statistically significant differences in ARA concerning gender in favor of women, specifically in repetition, critical thinking, and metacognitive strategies; however, no differences were found in the dimensions of planning, organization, time management, and environment [67]. On the other hand, the results also showed that none of the phases of self-regulation of learning varied according to the school level (grade/grade) of students. In other words, from the time they enter the first year through the fourth year (last year of secondary education) they have a similar level of self-regulation. This could indicate, on the one hand, the quality of change that self-regulatory processes have when they are used to intervene [10,20], and, on the other hand, the need to implement programs that develop this competence before entering a university [68]. This is also consistent with

previous research that has shown that university students do not have a sufficient level of self-regulation to face challenges adequately at the university level [69].

4.2. RQ2 Discussion: Evaluation of the Association between Teacher Motivation and Socio-Demographic Variables on TSR Phases

In teachers, the results showed some valuable predictors of self-regulatory processes in the teaching practice. Teacher role disposition is predicted by motivation, gender, and age, explaining 25% of the variance; teacher role performance is predicted only by motivation, explaining 28% of the variance; and teacher role self-evaluation is predicted by motivation, gender, and age, explaining 25% of the variance. This result is interesting because it allows us to identify some variables involved in teacher self-regulation. It is relevant considering that previous studies have revealed that high levels of teacher self-regulation are directly associated with good pedagogical results. For example, a study on a sample of 76 English teachers in Iran revealed that there is a significant correlation between their level of self-regulation and their success ($r = 0.52$, $p < 0.05$); moreover, the model containing total self-regulation scores can predict 27% of teachers' success [70]. On the other hand, in the different phases of teacher self-regulation, motivation was a predictor. This is consistent with previous studies that have shown that teacher professional motivation has a positive and significant effect on teacher performance [71], which in turn is also recognized as a significant predictor of their students' interest in the subject [72].

4.3. RQ3 Discussion: Evaluation of the Correlation between the SRL Phases with TSR Phases

Regarding the correlation between the phases of self-regulation of student learning and TSR phases, it was first possible to demonstrate in the descriptive analysis that the means for the different phases of self-regulation are higher for teachers compared to their students. At this point, it is important to highlight that teachers perceive themselves as self-regulated, since they self-report that they almost always implement strategies for self-regulation of their teaching. This is consistent with previous research results; for example, a study involving 106 teachers from rural and urban primary and secondary schools in Switzerland revealed that teachers have a positive self-concept about their own competence to self-regulate their learning [39].

The results also evidenced that there are positive and small significant correlations between the teacher role disposition with learning performance scale ($\rho = 0.10$, $p < 0.05$) and teacher role self-evaluation with both the learning performance scale and self-evaluation of study in their students ($\rho = 0.12$, $p < 0.05$). This is consistent with a study developed in Spain that confirmed that regulatory teaching (teaching effectiveness involving appropriately structured teaching and assistance to facilitate and induce self-regulated learning) was closely related to self-regulated learning. The correlation was moderate, but statistically significant ($r = 0.082$; $p < 0.03$) [73]. In fact, researchers claim that teachers' regulatory behaviors influence students to become better self-regulated learners [74]. It has been recognized in research that teachers' professional competencies are related to classroom practices, and that they also affect the academic and learning outcomes of their students [75]. This has implied that general frameworks on teaching professional competencies emphasize the need to expand these frameworks to include cognitive–motivational competencies beyond the disciplinary ones; however, the adaptation of general frameworks of teaching professional competencies specifically in SRL is incipient in the literature [39].

4.4. Reflections on Self-Regulation and Quality of Education

The promotion of self-regulation in the school environment becomes relevant since it is associated with better academic experiences and results, as well as general well-being of both students and teachers. From this perspective, SRL can contribute to the reduction of existing gaps and to the quality of education, as well as to the reduction of existing inequalities in learning, and, at the same time, increase the possibilities of access to opportunities for continuity of study and professional academic training.

It has been demonstrated that beyond the sociodemographic characteristics of vulnerability in schools, self-regulated students achieve control of their study and learning, with a sense of determination towards their personal and academic goals [76]. This shows the value of SRL; therefore, it is necessary to incorporate its promotion in an intentional way into the different public education policies that involve teachers and their students. Undoubtedly, this will allow support from a new area that supports the improvement of educational quality within schools.

The results of this research on self-regulation in teachers and students contribute to the challenge presented by the 2030 Agenda for Sustainable Development. The results are a relevant input to propose changes that will have a positive impact on the training and improvement of current teaching–learning practices in Chile. Undoubtedly, it would be beneficial to develop more specific training aimed at teachers to support them in the instruction of SRL within their classrooms and also to consider the work of the variables that affect their promotion or those self-regulatory variables that are diminished in the teachers' own self-regulation [77].

Evidence-based interventions support, on the one hand, the validity of working with reliable diagnoses, characterizations, and results carried out by competent professionals, and, on the other hand, adaptation to the specific sociocultural context. The development of SRL, in this educational instance, makes it possible to reduce school absenteeism, avoid early school dropout, and develop skills considered in the literature as transversal and enhancing human development [57].

This research is relevant in that it includes two of the most important agents in the teaching–learning process, i.e., students and teachers; therefore, it contributes to a more holistic understanding of the process of self-regulation of learning at an educational level that precedes university education, which prepares students to be more autonomous and to develop skills that allow them to positively face the adaptation to university education in their first year.

4.5. Limitations of the Study

In order to adequately interpret the results of this research, some limitations must be taken into consideration. First, as suggested in the literature [78], it is important to take into consideration the “constraints on generality” (COG); in other words, it is not possible to generalize the results to groups not represented in the study. This study focused on public secondary schools; therefore, the COGs are students and teachers belonging to private schools, elementary schools, universities, and from other regions of Chile.

A second limitation is that the data were collected during the first academic semester of 2022. This period coincided with the return to face-to-face classes in Chile after two years of online classes as a result of the COVID-19 pandemic. Therefore, the responses could be different in the next semester, since during this first semester both teachers and students had to adjust to this new post-pandemic scenario and, therefore, the data collection moment could have influenced the results of the present research, which could be further studied in future studies with a longitudinal scope. A third limitation refers to the type of instruments used corresponding to self-reporting scales, which, especially in the sample of teachers, could exhibit a social desirability bias in the responses. It could be questionable that they achieve a high self-regulation mean in the different phases of the teaching self-regulation process. There is precedent that the results of teachers self-reporting on components of their SRL promotion do not necessarily correlate with data from classroom observations of the teachers' own SRL instruction [35]. This is not unexpected; it can be explained by considering that self-reported self-regulation processes generally reflect teachers' perceptions of their overall and more habitual behavior, i.e., self-analysis over an extended period. On the other hand, classroom observations are characterized by showing teachers' behaviors in a single visit to the classroom. In summary, it would be desirable for studies to obtain data from both sources (self-reported and observed) to provide a more concrete perspective of the self-regulation of their teaching. A fourth limitation to consider

is the cross-sectional design of the research. This type of design allowed relationships to be established but did not allow causal inferences to be made. Therefore, no conclusions can be drawn about the direction of the effects of the interaction between the study variables, in this case, teacher and student self-regulation.

4.6. Future Research

Chronologically, it is possible to identify that progress has been made in the proposal of theoretical and empirical models to understand student self-regulation; then, progress was made in proposing different extracurricular interventions to improve student self-regulation; then, proposals for intracurricular interventions to improve student self-regulation were included. At this point, the focus is now on teachers as key actors in the promotion of self-regulation in the development of their classes. With the focus on teachers, variables that influence self-regulation promotion practices have been identified, such as epistemological beliefs, teacher knowledge in self-regulation, and self-efficacy for the promotion of SRL competence. However, although theoretically, it has already been argued in the specialized literature that the teacher's own self-regulation can play a determining role in the promotion of student SRL, given that it is considered a high-value opportunity to model SR strategies; however, there are still few studies that have moved in this direction, i.e., that confirm that teacher self-regulation influences student self-regulation [74]. Studies are needed that propose relationships of self-regulatory processes of teacher–student interaction processes in school [51]. This study moves in this direction and analyzes the teachers' self-regulation and their students' self-regulation.

The present research makes an important contribution to the specialized literature on self-regulation. It examined and situated the role of teachers and its correlation with students' SRL. However, there are unresolved issues that need further research. Some challenges include responding to the same limitations of this study, that is, to consider expanding the sample in terms of characteristics and groups to better understand what happens in different social contexts (public and private schools), educational levels (primary, secondary, and university education), diversity of students (gifted or with special educational needs), and other populations (regions of Chile and Latin America). Another advancement that is required is to consider longitudinal studies and explanatory models that consider the interaction of teacher and student regulation variables in order to explain the causality of the relationships. On this same point referring to study design, future research could implement mixed designs, complementing the results of quantitative data to enrich the understanding of comprehensive models of teacher and student self-regulation. It would also be interesting to incorporate other variables that could be influenced by teacher self-regulation, such as the academic results of their students. Finally, advancement in the design and application of multiple methods of measurement that allow for the triangulation of self-reported data with the real actions of teachers during the development of their classes is needed.

5. Conclusions

From the results and discussion of this study, it can be concluded that: (a) the study contributes instruments for measuring self-regulation of both students and teachers, and they are made available for other researchers and their respective adaptations to other social and educational contexts (see Annex 1); (b) in students, women are more self-regulated than men, and there are no differences in the level of self-regulation in the different grades of secondary education (first, second, third, and fourth); (c) the variables that significantly influence self-regulation of the teaching role are motivation, gender, and age; (d) teachers perceive themselves as self-regulated while students showed an insufficient level of self-regulation; (e) there are significant but small relationships between teachers' self-regulatory processes and those of their students; (f) further longitudinal and explanatory studies are required. In summary, it is concluded that this study has an impact on research and

education, making visible the importance of SRL in students and the training of teachers in TSR to advance the current challenges of a better education and a better society.

Author Contributions: Conceptualization, F.S.-D., Y.L.-A. and J.M.-N.; methodology, F.S.-D. and J.M.-N.; formal analysis, J.M.-N. and F.S.-D.; investigation, F.S.-D., J.M.-N., Y.L.-A., C.C.-S. and C.B.-S.; writing—original draft preparation, F.S.-D. and J.M.-N.; writing—review and editing, C.C.-S., C.B.-S. and G.L.-P.; data curation, C.C.-S., C.B.-S. and J.M.-N.; software, J.M.-N.; visualization, C.C.-S., C.B.-S. and G.L.-P.; supervision, F.S.-D. and Y.L.-A.; project administration and funding acquisition, F.S.-D. All authors have read and agreed to the published version of the manuscript.

Funding: To the FONDECYT Initiation Project N° 11201054 entitled “The reciprocal relationship between teacher self-regulation and student self-regulation of learning and academic performance. An explanatory model in secondary education”.

Institutional Review Board Statement: The project has been approved by the ethics committee of the Universidad Católica de la Santísima Concepción.

Informed Consent Statement: Ethical instruments were applied to all study participants. Specifically, letters of authorization were requested from school principals, then informed consent was obtained from teachers. In the case of the students, an assent was obtained in addition to the consent of their parents. Finally, retribution mechanisms were considered for the participants.

Data Availability Statement: For further information, please contact the corresponding author.

Acknowledgments: The authors would like to thank the teachers and students who participated in this study.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Instruments to Measure Teachers’ Self-Regulation Phases

Response format (Formato de respuesta)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------|--------------|----------|-----------------------|----------------|---------------|---------|
| never | almost never | seldom | half the time | frequently | almost always | always |
| nunca | casi nunca | rara vez | la mitad de las veces | con frecuencia | casi siempre | siempre |

| Teacher's role disposition scale (Escala de disposición del rol docente) | | | | | | | | | |
|--|--|---|---|---|---|---|---|---|--|
| Ítem | Please answer how often when planning your teaching you make the following statements (Responda con qué frecuencia cuando planifica su docencia realiza las siguientes afirmaciones) | | | | | | | | |
| 1 | I set short- and long-term goals to improve my teaching (Establezco metas a corto y largo plazo para mejorar mi docencia) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 2 | I develop a prioritized list of tasks based on my teaching role (Elaboro una lista priorizada con las tareas en función de mi rol docente) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 3 | I establish a schedule to complete the tasks of my role as a teacher (Establezco un horario para cumplir con las tareas de mi rol como docente) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 4 | I plan learning activities according to the needs of my students (Planifico actividades de aprendizaje de acuerdo a las necesidades de mis estudiantes) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 5 | I prepare the necessary materials for my classes (Preparo los materiales necesarios para la realización de mis clases) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| Teacher's role performance scale(Escala de desempeño del rol docente) | | | | | | | | | |
| Ítem | Please answer how often when you are teaching you make the following statements (Con qué frecuencia cuando desarrolla su docencia realiza las siguientes afirmaciones) | | | | | | | | |
| 1 | I monitor the achievement of my professional goals related to improving my teaching (Monitoreo el logro de mis metas profesionales relacionadas a la mejorar mi docencia) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 2 | I monitor my teaching strategies and adjust them if necessary (Monitoreo mis estrategias de enseñanza utilizadas y las ajusto si es necesario) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 3 | I monitor my daily and weekly schedule and adjust it if necessary (Monitoreo mi programación diaria y semanal y la ajusto si es necesario) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 4 | I monitor my pedagogical practices and adjust them if necessary (Monitoreo mis prácticas pedagógicas y las ajusto si es necesario) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 5 | I monitor the application of my professional resources and adjust them if necessary (Monitoreo la ejecución de mis recursos profesionales y los ajusto si es necesario) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |

| Ítem | Teacher's role self-evaluation scale(Escala de autoevaluación del rol docente) | | | | | | | |
|------|--|---|---|---|---|---|---|---|
| | Please answer how often at the end of the academic process you make the following statements (Responda con qué frecuencia al término de procesos académicos realiza las siguientes afirmaciones) | | | | | | | |
| 1 | I self-evaluate whether I achieved my professional goals related to improving my teaching role (Autoevalúo si cumplí con mis metas profesionales relacionadas con mejorar mi rol docente) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | I self-evaluate if I complied with my daily and weekly schedule (Autoevalúo si cumplí con mi programación diaria y semanal) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | I self-evaluate whether my teaching practices were effective (Autoevalúo si mis prácticas pedagógicas fueron efectivas) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | I self-assess whether my teaching strategies were effective (Autoevalúo si mis estrategias de enseñanza fueron efectivas) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | I self-assess whether my professional resources deployed were effective (Autoevalúo si mis recursos profesionales desplegados fueron efectivos) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Appendix B. Instrument to Measure Teacher Motivation

Response format (Formato de respuesta)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------|--------------|----------|-----------------------|----------------|---------------|---------|
| never | almost never | seldom | half the time | frequently | almost always | always |
| nunca | casi nunca | rara vez | la mitad de las veces | con frecuencia | casi siempre | siempre |

| Ítem | Teacher Motivation Scale (Escala de motivación docente) | | | | | | | |
|------|---|---|---|---|---|---|---|---|
| | In my teaching role, to what extent do I agree with the following statements | | | | | | | |
| 1 | I am motivated to teach my students (Me motiva enseñar a mis estudiantes) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | I am motivated to prepare my students for life (Me motiva preparar a mis estudiantes para la vida) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | I am motivated to foster my self-development as a teacher (Me motiva fomentar mi autodesarrollo como docente) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | I am motivated to improve my teaching practices (Me motiva mejorar mis prácticas pedagógicas) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | I am motivated by my profession as a teacher (Me motiva mi profesión como docente) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Appendix C. Instrument to Measure Self-Regulation of Learning Phases

Response format (Formato de respuesta)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------|--------------|----------|-----------------------|----------------|---------------|---------|
| never | almost never | seldom | half the time | frequently | almost always | always |
| nunca | casi nunca | rara vez | la mitad de las veces | con frecuencia | casi siempre | siempre |

| Ítem | Disposition learning scale (Escala de disposición al aprendizaje) | | | | | | | |
|------|--|---|---|---|---|---|---|---|
| | How often before starting to study do you make the following statements (Con qué frecuencia antes de empezar a estudiar, realiza las siguientes afirmaciones) | | | | | | | |
| 1 | Before I start studying, I plan short-term goals (daily, weekly) (Antes de empezar a estudiar planifico metas a corto plazo (diario, semanal)) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | Before I start studying, I prepare the necessary materials (Antes de empezar a estudiar preparo los materiales necesarios) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | Before I start studying, I make a schedule to organize my study time (Antes de empezar a estudiar hago un horario para organizar mi tiempo de estudio) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | Before I start studying, I prepare or look for a comfortable place (cleanliness, brightness, quiet, etc.) that will facilitate my study (Antes de empezar a estudiar preparo o busco un lugar con las condiciones (limpieza, luminosidad, silencioso etc.) que faciliten mi estudio) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | Before starting to study, I plan a prioritized list of my pending tasks (Antes de empezar a estudiar planifico de forma priorizada una lista con mis tareas pendiente) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Ítem | Learning performance scale (Escala de desempeño del aprendizaje) | | | | | | | |
| | How often while studying do you make the following statements (Con qué frecuencia mientras estudia realiza las siguientes afirmaciones) | | | | | | | |
| 1 | While studying, I check if the planned time is sufficient and I adjust it if necessary (Mientras estudio, reviso si el tiempo planificado es suficiente y lo ajusto si es necesario) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | While studying, I check if I am learning (Mientras estudio, reviso si estoy aprendiendo) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | While studying, I check if my strategies are effective and I adjust them if necessary (Mientras estudio, reviso si mis estrategias son efectivas y las ajusto si es necesario) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | | |
|--|--|---|---|---|---|---|---|---|
| 4 | While studying, I check if the study place allows me to study or find another one if necessary (Mientras estudio, reviso si el lugar de estudio me permite estudiar o busco otro si es necesario) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | While studying, I check if the materials I am using are sufficient or I get some others if necessary (Mientras estudio, reviso si los materiales que empleo son suficientes o complemento con otros si es necesario) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | While studying, I check if I am meeting my study goals and I adjust them if necessary (Mientras estudio, reviso si estoy cumpliendo mis metas de estudio y las ajusto si es necesario) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Self-evaluation learning scale (Escala de autoevaluación del aprendizaje) | | | | | | | | |
| Ítem | How often when you finish your studies do you make the following statements (Con qué frecuencia cuando termina de estudiar realiza las siguientes afirmaciones) | | | | | | | |
| 1 | When I finish my study, I self-evaluate if I made progress in relation to my previous knowledge (Cuando termino mi estudio, autoevalúo si avancé en relación con mi conocimiento previo) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | When I finish my study, I self-evaluate whether I met my proposed goals (Cuando termino mi estudio, autoevalúo si cumplí con mis metas propuestas) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | When I finish my study, I self-evaluate if the study place was adequate (Cuando termino mi estudio, autoevalúo si el lugar de estudio fue adecuado) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | When I finish my study, I self-evaluate if the study strategies employed were effective (Cuando termino mi estudio, autoevalúo si las estrategias de estudio empleadas fueron efectivas) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | When I finish my study, I self-evaluate whether I followed my planned schedule (Cuando termino mi estudio, autoevalúo si cumplí con mi horario planificado) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

References

- Dent, A.L.; Koenka, A.C. The Relation Between Self-Regulated Learning and Academic Achievement Across Childhood and Adolescence: A Meta-Analysis. *Educ. Psychol. Rev.* **2015**, *28*, 425–474. [\[CrossRef\]](#)
- Kitsantas, A.; Cleary, T. The Development of Self-Regulated Learning During Secondary School Years. A Social Cognitive Instructional Perspective. In *Handbook of Motivation at School*, 2nd ed.; Wentzel, K., Miele, D., Eds.; Routledge: New York, NY, USA, 2016; pp. 169–187.
- Rademacher, A. The Longitudinal Influence of Self-Regulation on School Performance and Behavior Problems from Preschool to Elementary School. *J. Res. Child Educ.* **2022**, *36*, 112–125. [\[CrossRef\]](#)
- Dibenedetto, M. Self-regulation in Secondary Classrooms: Theoretical and Research Applications to Learning and Performance. In *Connecting Self-Regulated Learning and Performance with Instruction Across High School Content Areas*; Springer International Publishing: Cham, Switzerland, 2018; pp. 3–23. [\[CrossRef\]](#)
- Antonelli, J.; Jones, S.J.; Backscheider Burridge, A.; Hawkins, J. Understanding the Self-Regulated Learning Characteristics of First-Generation College Students. *J. Coll. Stud. Dev.* **2020**, *61*, 67–83. [\[CrossRef\]](#)
- Anthonyamy, L.; Koo, A.; Hew, S. Self-regulated learning strategies in higher education: Fostering digital literacy for sustainable lifelong learning. *Educ. Inf. Technol.* **2020**, *5*, 2393–2414. [\[CrossRef\]](#)
- Skinner, D.; Saylor, C.; Boone, E.; Rye, K.; Berry, K.; Kennedy, R. Becoming lifelong learners: A study in self-regulated learning. *J. Allied Health* **2015**, *44*, 177–182. [\[CrossRef\]](#)
- Moseki, M.M.; Schulze, S. Fostering Self-Regulated Learning of Grade 10 Learners by Means of Participatory Action Research. *S. Afr. J. Educ.* **2019**, *39*, 1–9. [\[CrossRef\]](#)
- Zimmerman, B. Attaining self-regulation a social cognitive perspective. In *Handbook of Self-Regulation*; Boekaerts, M., Pintrich, P., Zeidner, M., Eds.; Elsevier: San Diego, CA, USA, 2000; pp. 13–40. [\[CrossRef\]](#)
- Zimmerman, B. Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *Am. Educ. Res. J.* **2008**, *45*, 166–183. [\[CrossRef\]](#)
- Panadero, E. A Review of Self-Regulated Learning: Six Models and Four Directions for Research. *Front. Psychol.* **2017**, *8*, 422. [\[CrossRef\]](#)
- Kaptumc, S.; Koech, P.K.; Mailu, S. Relationship between self-regulated learning and student performance in physics in public secondary schools in Nakuru East Sub-County. *J. Res. Method Educ.* **2018**, *8*, 79–83. [\[CrossRef\]](#)
- Lawrence, A.; Sailella, K. Self-Regulation of Higher Secondary Students in relation to achievement in mathematics. *Int. J. Multidiscip. Res.* **2019**, *9*, 258–265.
- Şen, Ş. The relationship between secondary school students' self-regulated learning skills and Chemistry achievement. *J. Balt. Sci. Educ.* **2016**, *15*, 312–324. [\[CrossRef\]](#)
- Tella, A. Self-regulated learning strategies as predictors of senior secondary school students' chemistry achievement in ondo state, Nigeria. *Sokoto Educ. Rev.* **2017**, *17*, 28–38. [\[CrossRef\]](#)
- Bai, B.; Wang, J.; Nie, Y. Self-efficacy, task values and growth mindset: What has the most predictive power for primary school students' self-regulated learning in English writing and writing competence in an Asian Confucian cultural context? *Camb. J. Educ.* **2021**, *51*, 65–84. [\[CrossRef\]](#)
- Kim, D.H.; Wang, C.; Ahn, H.S.; Bong, M. English Language Learners' Self-Efficacy Profiles and Relationship with Self-Regulated Learning Strategies. *Learn. Individ. Differ.* **2015**, *38*, 136–142. [\[CrossRef\]](#)
- Wang, H.; Yang, J.; Li, P. How and when goal-oriented self-regulation improves college students' well-being: A weekly diary study. *Curr. Psychol.* **2022**, *41*, 7532–7543. [\[CrossRef\]](#)

19. Ariani, D.W. Relationship Model among Learning Environment, Learning Motivation, and Self-Regulated Learning. *Asian Soc. Sci.* **2017**, *13*, 1–63. [\[CrossRef\]](#)
20. Zimmerman, B. From cognitive modeling to self-regulation: A social cognitive career path. *Educ. Psychol.* **2013**, *48*, 135–147. [\[CrossRef\]](#)
21. García-Ros, R.; Pérez-González, F.; Tomás, J.M.; Sancho, P. Effects of Self-Regulated Learning and Procrastination on Academic Stress, Subjective Well-Being, and Academic Achievement in Secondary Education. *Curr. Psychol.* **2022**, *21*, 1–15. [\[CrossRef\]](#)
22. Boshoff-Knoetze, A.; Duminy, L.; Du Toit, Y. Examining the effect of self-regulation failure on academic achievement in emergency remote teaching and learning versus face-to-face. *J. Appl. Res. High. Educ.* **2022**, *ahead-of-print*. [\[CrossRef\]](#)
23. Kavita, D.; Singh, S. Self-Regulated learning amongst secondary school students. *Sustain. Hum.* **2020**, *16*, 89–95.
24. Nugteren, M.L.; Jarodzka, H.; Kester, L.; Van Merriënboer, J.J.G. Self-Regulation of Secondary School Students: Self-Assessments Are Inaccurate and Insufficiently Used for Learning-Task Selection. *Instr. Sci.* **2018**, *46*, 357–381. [\[CrossRef\]](#)
25. Gaeta, M.L. La Implicación Docente En Los Procesos de Autorregulación Del Aprendizaje: Una Revisión Sistemática. *Rev. Comun. SEECI* **2014**, 74–81. [\[CrossRef\]](#)
26. Lee, J.C.K.; Wan, Z.H.; Hui, S.K.F.; Ko, P.Y. More Student Trust, More Self-Regulation Strategy? Exploring the Effects of Self-Regulatory Climate on Self-Regulated Learning. *J. Educ. Res.* **2019**, *112*, 463–472. [\[CrossRef\]](#)
27. Dignath, C.; Van der Werf, G. What teachers think about self-regulated learning: Investigating teacher beliefs and teacher behavior of enhancing students' self-regulation. *Educ. Res. Int.* **2012**, *2012*, 741713. [\[CrossRef\]](#)
28. Lawson, M.J.; Vosniadou, S.; Van Deur, P.; Wyra, M.; Jeffries, D. Teachers' and Students' Belief Systems About the Self-Regulation of Learning. *Educ. Psychol. Rev.* **2018**, *31*, 223–251. [\[CrossRef\]](#)
29. Spruce, R.; Bol, L. Teacher Beliefs, Knowledge, and Practice of Self-Regulated Learning. *Metacogn. Learn.* **2014**, *10*, 245–277. [\[CrossRef\]](#)
30. Gan, Z.; Liu, F.; Yang, C.C.R. Student-Teachers' Self-Efficacy for Instructing Self-Regulated Learning in the Classroom. *J. Educ. Teach.* **2020**, *46*, 120–123. [\[CrossRef\]](#)
31. Vattøy, K.-D. Teachers' Beliefs about Feedback Practice as Related to Student Self-Regulation, Self-Efficacy, and Language Skills in Teaching English as a Foreign Language. *Stud. Educ. Eval.* **2020**, *64*, 100828. [\[CrossRef\]](#)
32. Xiao, Y.; Yang, M. Formative Assessment and Self-Regulated Learning: How Formative Assessment Supports Students' Self-Regulation in English Language Learning. *System* **2019**, *81*, 39–49. [\[CrossRef\]](#)
33. Jayawardena, P.R.; van Kraayenoord, C.E.; Carroll, A. Science Teachers' Practices: Teaching for Self-Regulated Learning in Relation to Pintrich and Zusho's. Model. *Int. J. Educ. Res.* **2019**, *94*, 100–112. [\[CrossRef\]](#)
34. Lau, K. The Effectiveness of Self-Regulated Learning Instruction on Students' Classical Chinese Reading Comprehension and Motivation. *Read. Writ.* **2020**, *33*, 2001–2027. [\[CrossRef\]](#)
35. Dignath, C.; Büttner, G. Teachers' Direct and Indirect Promotion of Self-Regulated Learning in Primary and Secondary School Mathematics Classes—Insights from Video-Based Classroom Observations and Teacher Interviews. *Metacogn. Learn.* **2018**, *13*, 127–157. [\[CrossRef\]](#)
36. Peeters, J.; De Backer, F.; Reina, V.R.; Kindekens, A.; Buffel, T.; Lombaerts, K. The Role of Teachers' Self-Regulatory Capacities in the Implementation of Self-Regulated Learning Practices. *Procedia—Soc. Behav. Sci.* **2014**, *116*, 1963–1970. [\[CrossRef\]](#)
37. Ali, S.; Yasmeen, R. Practice to Preach Self-Regulation: Use of Metacognitive Strategies by Medical Teachers in Their Learning Practices. *Pak. J. Med. Sci.* **2019**, *35*, 1642–1646. [\[CrossRef\]](#) [\[PubMed\]](#)
38. Capa-Aydin, Y.; Sungur, S.; Uzuntiryaki, E. Teacher Self-regulation: Examining a Multidimensional Construct. *Educ. Psychol.* **2009**, *29*, 345–356. [\[CrossRef\]](#)
39. Karlen, Y.; Hertel, S.; Hirt, C.N. Teachers' Professional Competences in Self-Regulated Learning: An Approach to Integrate Teachers' Competences as Self-Regulated Learners and as Agents of Self-Regulated Learning in a Holistic Manner. *Front. Educ.* **2020**, *5*, 159. [\[CrossRef\]](#)
40. Chen, Y.; Jang, S. Exploring the Relationship Between Self-Regulation and TPACK of Taiwanese Secondary In-Service Teachers. *J. Educ. Comput. Res.* **2018**, *57*, 978–1002. [\[CrossRef\]](#)
41. Dimángano, P. Innovar en el aula. Concepciones de enseñanza y aprendizaje para el siglo XXI. *Acinnet-Res.* **2020**, *4*, 43–49.
42. Kramarski, B.; Kohen, Z. Promoting Preservice Teachers' Dual Self-Regulation Roles as Learners and as Teachers: Effects of Generic vs. Specific Prompts. *Metacogn. Learn.* **2016**, *12*, 157–191. [\[CrossRef\]](#)
43. Tricarico, K.; Yendol-Hoppey, D. Teacher learning through self-regulation: An exploratory study of alternatively prepared teachers' ability to plan differentiated instruction in an urban Elementary School. *Teach. Educ. Q.* **2012**, *39*, 39–158.
44. Uzuntiryaki-Kondakci, E.; Demirdöğen, B.; Akın, F.N.; Tarkin, A.; Aydın-Günbatır, S. Exploring the Complexity of Teaching: The Interaction between Teacher Self-Regulation and Pedagogical Content Knowledge. *Chem. Educ. Res. Pract.* **2017**, *18*, 250–270. [\[CrossRef\]](#)
45. Pamuk, S.; Sungur, S.; Oztekin, C. A Multilevel Analysis of Students' Science Achievements in Relation to Their Self-Regulation, Epistemological Beliefs, Learning Environment Perceptions, and Teachers' Personal Characteristics. *Int. J. Sci. Math. Educ.* **2016**, *15*, 1423–1440. [\[CrossRef\]](#)
46. Pazhoman, H.; Sarkhosh, M. The Relationship between Iranian English High School Teachers' Reflective Practices, Their Self-Regulation and Teaching Experience. *Int. J. Instr.* **2019**, *12*, 995–1010. [\[CrossRef\]](#)

47. Jiang, J.; Vauras, M.; Volet, S.; Wang, Y. Teachers' Emotions and Emotion Regulation Strategies: Self- and Students' Perceptions. *Teach. Teach. Educ.* **2016**, *54*, 22–31. [\[CrossRef\]](#)
48. Werner, C.; Werner, A. Aprendizagem Autorreguladora: Aportes Teóricos Para Subsidiar a Educação Científica. *Res. Soc. Dev.* **2020**, *9*, e71911633. [\[CrossRef\]](#)
49. Persico, D.; Milligan, C.; Littlejohn, A. The Interplay Between Self-Regulated Professional Learning and Teachers' Work-Practice. *Procedia—Soc. Behav. Sci.* **2015**, *191*, 2481–2486. [\[CrossRef\]](#)
50. De la Fuente, J.; Justicia, F.; Sander, P.; Cardelle-Elawar, M. Personal Self-Regulation and Regulatory Teaching to predict Performance and Academic Confidence: New evidence for the DEDEPRO Model. *Electron. J. Res. Educ. Psychol.* **2014**, *12*, 597–620. [\[CrossRef\]](#)
51. Alvi, E.; Gillies, R. Teachers and the Teaching of Self-Regulated Learning (SRL): The Emergence of an Integrative, Ecological Model of SRL-in-Context. *Educ. Sci.* **2020**, *10*, 98. [\[CrossRef\]](#)
52. Schunk, D.; Berger, E.M.; Hermes, H.; Winkel, K.; Fehr, E. Teaching Self-Regulation. *Nat. Hum. Behav.* **2022**. [\[CrossRef\]](#)
53. Hernández, A.; Hidalgo, M.D.; Hambleton, R.K.; Gómez Benito, J. International test commission guidelines for test adaptation: A criterion checklist. *Psicothema* **2020**, *32*, 390–398. [\[CrossRef\]](#)
54. Hair, J.F.; Black, W.C.; Babin, B.J.; Anderson, R.E. *Multivariate Data Analysis: Pearson New International Edition*, 7th ed.; Pearson Education Limited: Harlow, UK, 2014.
55. Kline, R.B. *Principles and Practice of Structural Equation Modeling*, 4th ed.; Guilford Publications: New York, NY, USA, 2015.
56. Sáez-Delgado, F.; Mella-Norambuena, J.; López-Angulo, Y.; León-Ron, V. Escalas Para Medir Las Fases de Autorregulación Del Aprendizaje En Estudiantes de Secundaria. *Inf. Tecnol.* **2021**, *32*, 41–50. [\[CrossRef\]](#)
57. Sáez-Delgado, F.; Mella-Norambuena, J.; López-Angulo, Y.; Olea-González, C.; García-Vásquez, H.; Porter, B. Association Between Self-Regulation of Learning, Forced Labor Insertion, Technological Barriers, and Dropout Intention in Chile. *Front. Educ.* **2021**, *6*, 488. [\[CrossRef\]](#)
58. Chambers, J.M.; Freeny, A.; Heiberger, R.M. Chapter 5 of Statistical Models in S. In *Analysis of Variance; Designed Experiments*, 1st ed.; Chambers, S.J.M., Hastie, T.J., Eds.; Routledge: London, UK, 1992; p. 49.
59. Dallal, G.E.; Wilkinson, L. An Analytic Approximation to the Distribution of Lilliefors's Test Statistic for Normality. *Am. Stat.* **1986**, *40*, 294. [\[CrossRef\]](#)
60. Fox, J.; Weisberg, S. *An R Companion to Applied Regression*, 3rd ed.; Sage: Thousand Oaks, CA, USA, 2019.
61. Breusch, T.S.; Pagan, A.R. A Simple Test for Heteroscedasticity and Random Coefficient Variation. *Econometrica* **1979**, *47*, 1287–1294. [\[CrossRef\]](#)
62. Fox, J.; Monette, G. Generalized collinearity diagnostics. *J. Am. Stat. Assoc.* **1992**, *87*, 178–183. [\[CrossRef\]](#)
63. Durbin, J.; Watson, G.S. Testing for Serial Correlation in Least Squares Regression. III. *Biometrika* **1971**, *58*, 1. [\[CrossRef\]](#)
64. Pintrich, P.R. Understanding Self-Regulated Learning. *New Dir. Teach. Learn.* **1995**, *1995*, 3–12. [\[CrossRef\]](#)
65. Wolters, C.A.; Pintrich, P.R. Contextual Differences in Student Motivation and Self-Regulated Learning in Mathematics, English and Social Studies Classrooms. In *Metacognition in Learning and Instruction*; Springer: Dordrecht, The Netherlands, 2001; pp. 103–124.
66. Lamas Rojas, H. Aprendizaje autorregulado, motivación y rendimiento académico. *Liberabit* **2008**, *14*, 15–20.
67. Martín, M.; Bueno, J.; Ramírez, M. Evaluación del aprendizaje autorregulado en estudiantes de bachillerato mexicanos. *Aula Abierta* **2010**, *38*, 59–70.
68. Lobos, K.; Sáez-Delgado, F.; Bruna, D.; Cobo-Rendon, R.; Díaz-Mujica, A. Design, Validity and Effect of an Intra-Curricular Program for Facilitating Self-Regulation of Learning Competences in University Students with the Support of the 4Planning. *App. Educ. Sci.* **2021**, *11*, 449. [\[CrossRef\]](#)
69. Sáez, F.M.; Bustos, C.E.; Pérez, M.V.; Mella, J.A.; Lobos, K.A.; Díaz, A.E. Disposición al Estudio, Autoeficacia y Atribuciones Causales En Estudiantes Universitarios Chilenos. *Propósitos Y Represent.* **2018**, *6*, 199–245. [\[CrossRef\]](#)
70. Toussi, M.T.M.; Boori, A.A.; Ghanizadeh, A. The Role of EFL Teachers' Self-Regulation in Effective Teaching. *World J. Educ.* **2011**, *1*, 39–48. [\[CrossRef\]](#)
71. Andriani, S.; Kesumawati, N.; Kristiawan, M. The influence of the transformational leadership and work motivation on teachers performance. *Int. J. Sci. Technol. Res.* **2018**, *7*, 19–29.
72. De la Fuente, J.; Zapata, L.; Martínez-Vicente, J.M.; Cardelle-Elawar, M.; Sander, P.; Justicia, F.; Pichardo, M.C.; García-Belén, A.B. Regulatory Teaching and Self-Regulated Learning in College Students: Confirmatory Validation Study of the IATLP Scales. *Electron. J. Res. Educ. Psychol.* **2017**, *10*, 839–866. [\[CrossRef\]](#)
73. Schiefele, U. Classroom Management and Mastery-Oriented Instruction as Mediators of the Effects of Teacher Motivation on Student Motivation. *Teach. Teach. Educ.* **2017**, *64*, 115–126. [\[CrossRef\]](#)
74. De la Fuente, J.; Zapata, L.; Martínez-Vicente, J.M.; Sander, P.; Cardelle-Elawar, M. The Role of Personal Self-Regulation and Regulatory Teaching to Predict Motivational-Affective Variables, Achievement, and Satisfaction: A Structural Model. *Front. Psychol.* **2014**, *6*, 399. [\[CrossRef\]](#)
75. Fauth, B.; Decristan, J.; Decker, A.-T.; Büttner, G.; Hardy, I.; Klieme, E.; Kunter, M. The Effects of Teacher Competence on Student Outcomes in Elementary Science Education: The Mediating Role of Teaching Quality. *Teach. Teach. Educ.* **2019**, *86*, 102882. [\[CrossRef\]](#)

-
76. Sáez-Delgado, F.; López-Angulo, Y.; Arias-Roa, N.; Mella-Norambuena, J. Revisión systematic review of self-regulation learning in high school. *Perspect. Educ.* **2022**, *61*, 167–191. [[CrossRef](#)]
 77. Sáez-Delgado, F.; López-Angulo, Y.; Mella-Norambuena, J.; Casanova, D. Prácticas Docentes Para Promover La Autorregulación Del Aprendizaje Durante La Pandemia COVID-19: Escalas de Medición y Modelo Predictivo. *Form. Univ.* **2022**, *15*, 95–104. [[CrossRef](#)]
 78. Simons, D.; Shoda, Y.; Lindsay, D. Constraints on Generality (COG): A proposed addition to all empirical papers. *Perspect. Psychol. Sci.* **2017**, *12*, 1123–1128. [[CrossRef](#)]