

DIFFERENCES IN SELF-REGULATED LEARNING IN POSTGRADUATE STUDENTS: AN ANALYSIS RELATING AGE AND GENDER TO THE USE OF STRATEGIES

RAIMUNDO NONATO LIMA FILHO

University of Pernambuco and Educational Authority of the São Francisco Valley. Address: Cidade Universitária, s/n | Vila Eduardo | 56328-903 | Petrolina/PE | Brazil.

<http://orcid.org/0000-0003-4953-5260>
rnfilho@gmail.com

SILVIA PEREIRA DE CASTRO CASA NOVA

University of São Paulo. Address: Av. Prof. Luciano Gualberto, 908 | Cidade Universitária | 05508-010 | São Paulo/SP | Brazil.

<http://orcid.org/0000-0003-1897-4359>
silvianova@usp.br

ABSTRACT

The first studies involving self-regulation in learning emerged in the 1980s when researchers began to analyze how students conducted learning independently. This study aims to analyze the implications of age and gender on the level of self-regulated learning in master and doctorate students in Accounting in Brazil. The results indicated that the gender variable significantly influences the student's self-regulated learning level. Relevant limitations of this study can be considered as opportunities for future research: the sample was taken from a specific audience; research may show a bias in common methods, and there was low participation of professional master students. Future studies may adopt different methodological strategies and/or involve more diverse samples or accompany students for longer.

Keywords: Self-regulated learning. Age. Gender. Accounting Education.

1 INTRODUCTION

The Self-Regulated Learning Theory (SRL) emerged as a theoretical foundation in Education, focusing on how each student initiates, monitors, and controls their own learning (Alghamdi, Karpinski, Lepp, & Barjley, 2020; Boekaerts & Cascallar, 2006; Efklides, 2011; Zimmerman, 2000).

The first studies involving self-regulation in learning emerged in the 1980s, following the example of Zimmerman and Martinez-Pons (1986), when researchers began to analyze how students conducted learning independently. This theory argues that self-regulated students are

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active in their learning processes, in the behavioral, metacognitive, and motivational spheres (Rosário, 1999; Vukman & Licardo, 2010).

According to Zimmerman and Martinez-Pons (1990), SRL advocates that people have individual learning initiatives, analyzing how students select, organize, plan, and create beneficial learning environments for themselves. In this sense, Schunk and Zimmerman (1994) mention that the self-regulation of learning involves three phases: anticipation, performance, and final assessment. Students with high levels of self-regulation are cognitive, metacognitive, and motivationally active.

However, it should be noted that most studies of these research strands focus on academic performance since the early years of elementary school, going through adolescence (Liew, McTigue, Barrois, & Hughes, 2008; Vukman & Licardo, 2010). Other studies involved higher education (Banarjee & Kumar, 2014; Flynn, Olson & Reinhardt, 2000), finding similar results. However, in the context of postgraduate studies in Brazil, this discussion's bias is still unprecedented.

The present study intends to project them into the context of *stricto sensu* postgraduate education, that is, master's and doctoral degrees, precisely because it is at these levels of education that the autonomous and critical posture is most required.

Self-regulation of learning is not a neural capacity, nor is it an academic performance skill. Rather, it is a process that transforms mental capacity into autonomy and control of individual skills, making it possible to monitor, conduct, and regulate actions that help achieve personal goals for the knowledge construction (Zimmerman, 2000). For Dweck (2002), self-regulated individuals are aware of their strengths and weaknesses. They can develop a repertoire of strategies that bypass insufficient characteristics to perform certain academic tasks and stimulate skills that help to overcome challenges. Perry, Phillips, and Hutchinson (2006), in turn, claim that self-regulated students achieve academic success, as they are prone to take on challenging tasks and develop a deep understanding of specific topics.

The accounting professional must also be involved in supporting complex decisions, with different impacts for *stakeholders* and in different dimensions, whether financial, economic, environmental, or social (Benevides & Lima Filho, 2020).

Faced with this scenario, the recommendations of the *Accounting Education Change Commission* [AECC] (1990) and the *American Institute of Certified Public Accountants* [AICPA] (2000) point to the need for classroom training that leads Accounting students to adopt attributes and skills of permanent learning since the teaching and professional praxis require constant updating. The *American Accounting Association* [AAA] (2012), in turn, indicates seven recommendations on teaching the accounting profession, namely: profession apprehended for the future; flexible pedagogies and teacher training; critical teaching; curricula involving learning resources; attraction of high potential candidates for the profession; mechanism for disclosing current and future markets; and thinking-to-action strategies. These recommendations are directly related to the discussion of this research, which bases its proposal on continuing education to integrate research, education, and accounting practice.

In Brazil, the growth in the offer of undergraduate courses in Accounting and the recent expansion in the number of postgraduate programs in Accounting, which consequently stimulated the increase in the number of academic journals in the area, in addition to the impacts of the process of adopting international *Financial Reporting Standards* - IFRS, have corroborated AAA's concerns and indications.

From this context, the idea of this study arises to explore the relationship between the age/gender variables and the self-regulated learning levels of accounting students in master and doctoral programs in Brazil. Thus, it is intended to answer the following research problem: what is the relationship between age and/or gender with the level of self-regulated learning? The findings of this study are relevant to the teaching of Accounting, given the importance of research involving knowledge strategies and their transfer to new learning, especially in individuals who

will be in the short term - or already are - developing research and leading the training of new professionals in the area.

2 THEORETICAL BACKGROUND

Throughout their lives, people accumulate a significant amount of different types of knowledge in memory. This diversity of information serves different purposes. For Schraw (2006), there are three main types of knowledge: declarative, procedural, and self-regulating. The declarative type corresponds to the knowledge of the facts and concepts. The procedural type is the knowledge of how to do things. This author described declarative and procedural knowledge as the building blocks of the development of cognitive skills. But, to develop such skills, it is necessary to structure around the self-regulation of knowledge, without which, even with large amounts of declarative and procedural knowledge, there would be no way to help people survive and adapt (Zeidner, Boekaerts, & Pintrich, 2000; Zimmerman, 2000).

SRL is defined as an active process in which the student has and makes appropriate use of a repertoire of skills and strategies to improve learning. Students monitor, regulate, and control their cognition, motivation, and behavior to achieve goals through learning. Thus, self-regulated learning occurs as students face problems, apply strategies, monitor their performance, and interpret the results of their efforts in an autonomous way (Zimmerman & Schunk, 2011).

Samruayruen, Enriquez, Natakatoong, and Samruayruen (2013) define self-regulated learning as a learning behavior guided by metacognition (thinking about thinking, including planning, monitoring, and regulating activities, strategic action, organization, time management and assessing the progress by an established standard); and motivation to learn (self-confidence, goal setting, and task value). Pang and Wu (2014) state that self-regulated learning has an academic advantage over “traditional learning”, in which the student plays a passive role in the construction of their knowledge.

Self-regulated learning is influenced by the constructivist paradigm that highlights the student's role in the learning process (Dresel & Haugwitz, 2008). In this perspective, SRL is defined, in the domain of the socio-cognitive perspective, as thoughts, feelings, and attitudes generated by the individual, which are planned and adapted to the needs of carrying out their own motivation and learning (Dinsmore, Alexander, & Loughlin, 2008; Miller & Byrnes, 2001; Schunk, 2005; Zimmerman & Kitsantas, 1997). SLR is a process that establishes active participation of the individual; it requires awareness of the goals to be achieved; recognizes the demands of the action one wants to achieve; discriminates and institutes internal and external resources to carry out the action; assesses the level of achievement achieved; and it alters the procedures used if the result one got was not what was planned (Demetriou, 2000; Pajares, 2002; Virtanen & Nevgi, 2010).

The theme 'self-regulated learning' has been investigated by several authors, both in foreign literature, such as the research by Boekaerts, Pintrich, and Zeidner (2005), as well as in national literature, by Boruchovitch (2004), Polydoro and Azzi (2008, 2009), and Rosário and Polydoro (2012).

In education, Schunk and Zimmerman (1998, 2007, 2008, 2011) developed and consolidated relevant references in the theoretical fields involved with self-regulated learning. In this context, different theoretical points of view of self-regulated learning describe different models (Samruayruen *et al.*, 2013). Pintrich (2000) clarifies that the different models generally share the following premises: learning is a constructive process and is influenced by internal and external factors; students have the potential to regulate and control aspects of motivation, cognition, and behavior, in which they relate to learning; students set goals or standards for their learning; self-regulated learning strategies serve as an internal intermediary between contextual characteristics and academic performance, and self-regulated learning encompasses several phases and components.

For Pintrich (2000), the definition of SRL follows the vision of an active constructive process, through which the student establishes goals for his/her learning and then tries to monitor, regulate, and control his/her cognition, motivation, and behavior towards goals, guided and limited by the personal and contextual characteristics of the environment.

According to Figueiredo (2013), the model formulated by Pintrich (2000) is one of the most important attempts to synthesize the self-regulatory learning process. The model proposes a theoretical framework based on a socio-cognitive perspective that classifies and analyzes the different roles of the processes that constitute self-regulated learning.

Pintrich (2000) explains that the self-regulatory processes begin in the planning phase, in which the definition of goals is carried out, previous knowledge on the topic. Metacognitive knowledge is activated to recognize the difficulties involved in the various tasks and identify the knowledge, skills, resources, and strategies necessary to face difficulties and achieve goals. In this phase, motivational beliefs are also triggered, the so-called self-efficacy beliefs, the value given to the task, and personal interest, as well as the behavioral and contextual areas with the planning of time and effort to be used in tasks and the activation of perceptions about these activities.

The monitoring phase consists of actions that make students aware of their state of cognition, motivation, emotions, judgments, time use, and effort, in addition to working conditions and the environment. These actions are manifested when, for example, students are aware that they have not understood something they have just read and heard, when they are aware that they are reading too fast for the type of text involved or for the goals they have set, or when they actively observe their own reading comprehension, asking questions to check if they understand (Montalvo & Torres, 2004).

According to Montalvo and Torres (2004), this phase also encompasses the motivational and behavioral pattern, identifying whether an individual feels competent to complete a task, whether he/she needs to apply more time and effort to complete such an activity, or if he/she needs help. The context is also decisive insofar as the characteristics of the tasks and the classroom context are reflected in the student's behavior, determining the planning, control, and assessment to achieve what is being asked. Thus, the rules defined for carrying out a task, the way performance will be assessed, which job requirements, the reward and punishment systems, and the teacher's behavior are some contextual characteristics that affect students' performance.

Concomitantly with monitoring, control is perceived, which encompasses the selection and use of cognitive, metacognitive, and motivational strategies and the adoption of behaviors according to the context requirement. For example: the interference in the task, in the atmosphere, and the class structure, with the alteration or renegotiation of the various academic tasks, with the context being changed or abandoned. It is important to note that, although there is a separation between the monitoring and control phases at the conceptual level, the processes are carried out simultaneously, according to empirical studies in this area (Pintrich, 2000).

Finally, there is the reaction phase, corresponding to the student's judgments and assessments about the task performance, comparing it with the criteria previously established by him/her, the professor, and the task requirements, by comparing with colleagues and from the class environment, to attribute causes to success or failure, experiencing affective reactions based on the results obtained and adopting behaviors to be followed in the future (Figueiredo, 2013).

2.1 Definition of hypotheses

Mayville (2007) investigated the influence of age in the context of self-regulation in master and doctorate students in Nursing in the age group of 24 to 53 years old. The results showed that older students had less difficulty in completing the supervision program (*online*) applied as a research instrument.

Miles and Stine-Morrow (2004) examined the influence of age on self-regulated adult learning, specifically involving reading ability. The study indicated that older adults are more efficient in showing self-regulation levels in the development and deepening of readings.

H1: The older the age, the higher the respondent's SRL level.

Lima Filho, Lima, and Bruni (2015) analyzed self-regulated learning in Accounting students at two public universities in Bahia, under the context of variables such as gender, age, and stage in the course. A sample of 249 participants showed that gender and age are factors that influence a student's level of self-regulation. Women and younger students tend to achieve higher levels of self-regulated learning. As for gender, the personality of women seeking autonomy may have influenced these results. As for age, current pedagogical practices that promote constructivist learning may also have influenced these results.

Hefer (2007) analyzed whether an individual's gender and ethnicity can positively influence the self-regulated posture of undergraduate students in the Psychology course at a public university in the United States of America. The results revealed that male students, who in the analyzed sample were a minority, had low self-confidence and significantly different self-regulation in relation to the female gender. Similar results were evidenced by Lawanto and Goodridge (2012) in early childhood education.

H2: Gender influences the respondent's SRL level.

3 METHODOLOGICAL PROCEDURES

This empirical study is established in the hypothetical-deductive method, has a quantitative character, objectively incremental, supported by bibliographic research, and defined as descriptive research regarding its goals. At the same time, it seeks to investigate the association between age/gender and self-regulation, aiming to improve current knowledge and admit actions in this field of study.

As for the type of study, this research is characterized as a survey, which can be described as the acquisition of data or information about attributes, actions, or judgments of a certain group of people, appointed as a representative of a target population, through an instrument, usually a questionnaire (Pinsonneault & Kraemer, 1993). As the basic properties of the survey method, the objective is to produce quantitative definitions of a population and the use of a predefined instrument.

In the survey, only individuals who made themselves available for data collection participate, indicating possible biases in the responses and the probable non-representativeness of the target population. To circumvent the possibility of data limitation, this study sought to build a large sample and use quantitative methods that guarantee safety in data inference and analysis. For this reason, Structural Equation Modeling was adopted, which brings together techniques and procedures used together to examine relationships between variables.

Twenty-five programs recommended and recognized by Capes (a program was discontinued and will be extinguished after the completion of ongoing courses) regularly operated in the country, 24 of which were academic master's degrees, three professional master's degrees, and 13 doctoral degrees.

The population of this research gathered 1,140 students, linked to the postgraduate programs in Accounting in 2015 recommended by Capes and sponsored by public and private educational institutions spread across the country, with 752 from academic master's courses, 128 from professional master's courses, and 260 from doctoral courses. Data collection took place between June and September 2015.

1. Self-assessment: statements that indicate students' assessments of the quality or progress of their work (...I checked my work to make sure it was good);
2. Organization and transformation: statements indicating the students' initiatives to reorganize, improving the learning materials (... I always make a scheme before writing the reports of the Chemistry experiments);
3. Goal setting and planning: statements indicating the setting of educational goals: planning and completing activities related to those goals (I start studying two weeks before the tests, and I rest assured);
4. Information search: statements indicating the effort expended by students to acquire extra information from non-social sources when facing school tasks (before starting work, I go to the school library to collect as much information on the topic);
5. Taking notes: statements indicating the efforts expended to record the results (in Physics classes, I make the most notes about what the professor says);
6. Environmental structure: statements indicating the effort spent to select or change the physical or psychological environment to promote learning (in order not to be distracted, I isolate myself in the room to concentrate on what I am going to do, and I turn off the sound);
7. Self-consequences: statements indicating the imagination or the realization of rewards or punishments for school successes or failures (if the test goes well, I offer myself gifts);
8. Repetition and memorization: statements indicating the students' initiatives and efforts to memorize the material (when preparing a Biology test, I write a formula many times until I know it by heart);
9. Help from professors; 10. Help from close peers; 11. Expert help: statements indicating students' initiatives and efforts to seek help from professors (9), peers (10), and experts (11) (if I have difficulties studying, I ask my father, who is a physician, for help...).
12. Review of notes; 13. Tests review; and 14. Bibliography review: statements indicating students' efforts/initiatives to review grades (12), tests (13), and consulted sources (14) to prepare for a class or a written exercise (before the tests, I always review the summaries I made of the material; to prepare myself for a test, I solve the statements of the tests I have already done).

Figure 1. Self-regulated learning strategies

Source: Adapted from Farajollahi and Moenikia (2010).

Zimmerman and Martinez-Pons (1986) presented 14 possible self-regulated learning strategies, as explained in Figure 1, plus Rosário (1999) examples. The use would give the student a valuable tool, as its use is highly correlated with the academic success rates and with the professors' opinions about their degree of self-regulation in the classroom.

The data collection instrument presented the Free and Informed Consent Form (FICF) and gathered ten statements regarding the use of self-regulated learning strategies proposed by Zimmerman and Martinez-Pons (1986), as shown in Figure 2. For each of these statements, the respondent should assign an answer through a score between 1 (Strongly disagree) and 5 (Strongly agree).

Statement	Self-regulated learning strategy
E1. Upon completion of an academic study, I review it to make sure it is correct	1. Self-assessment
E2. I try to plan before starting a study or academic activity	2. Organization and transformation
E3. If I have a test, I start studying as soon as possible to be rested and calm on the day of its completion	3. Setting goals and planning
E4. Before starting an academic study, I always go to the library and other research resources (physical or digital) to get the most information on the subject	4. Search for information
E5. I try to write down as much of a text as I read or of a professor's lecture	5. Taking notes
E6. For better concentration, I always work in an environment that does not offer distraction	6. Environmental structure
E7. When I take a test, if I do well, I offer myself a reward (I go to the cinema, I make a snack); if the opposite happens, if I fail, I give up something I want	7. Self-consequences

E8. I use strategies until I can memorize information or a formula	8. Repetition and memorization
E9. When difficulties arise that I cannot overcome alone, I seek outside help (professors, colleagues, others)	9. Help from professors; 10. Help from close peers; 11. Expert help
E10. I assess my performance, see how I can improve to prepare myself for an evaluation	12. Review of notes; 13. Tests review; and 14. Bibliography review

Figure 2. The first part of the data collection instrument

Source: Adapted from Lima Filho *et al.* (2015)

Data analysis involves: (1) descriptive statistical analysis of the sample; (2) exploratory factor analysis and confirmatory factor analysis in Structural Equation Modeling; and (3) for hypothesis testing, a linear regression analysis, with age and gender being the dependent variables and the level of self-regulated learning, measured by SRLS, the explanatory variable. It was not necessary to perform a pre-test, as previous studies have already validated the instrument.

4 DATA ANALYSIS

4.1 Sample characterization

The descriptive analysis of the data, collected and processed with the aid of the application *Statistical Package for Social Sciences* (SPSS), revealed that, concerning gender, there is a balance between the proportion of men/population (51.7%) and the proportion of women/population (48.3%). Therefore, it is evident that the sample used represents the population considered since there was a balance between the proportions of men/sample (52.9%) and women/sample (47.1%).

Table 1

Representative sample of the population

INSTITUTION	ENROLLED (A)	PARTICIPANTS (B)	PROPORTION PARTICIPANTS/ ENROLLED (% B/A)	PROPORTION ENROLLED/ POPULATION (% A/C) (E)	PROPORTION PARTICIPANTS/ SAMPLE (%B/D) (F)
UFC	94	20	21.3	8.2	3.9
UnB	30	19	63.3	2.6	3.7
UnB/UFPB/UFRN	68	23	33.8	6.0	4.5
Ufes	37	21	56.8	3.2	4.1
Fucape	62	30	48.4	5.4	5.8
UFMG	25	14	56.0	2.2	2.7
UFPB	20	15	75.0	1.8	2.9
UFPE	31	6	19.4	2.7	1.2
UEM	34	27	79.4	3.0	5.2
UFRJ	44	27	61.4	3.9	5.2
UFU	34	22	64.7	3.0	4.3
UERJ	20	9	45.0	1.8	1.7
UFRN	10	4	40.0	0.9	0.8
Unisinos	78	27	34.6	6.8	5.2
FURB	72	31	43.1	6.3	6.0
UPM	41	11	26.8	3.6	2.1
Unifecap	56	20	35.7	4.9	3.9
PUC/SP	53	18	34.0	4.6	3.5
UFBA	36	21	58.3	3.2	4.1
UFPR	47	25	53.2	4.1	4.8
UNIOESTE	15	12	80.0	1.3	2.3
UFSC	59	27	45.8	5.2	5.2

UFRPE	15	5	33.3	1.3	1.0
USP	116	58	50.0	10.2	11.2
USP/RP	43	24	55.8	3.8	4.7
Total	1,140 (C)	516 (D)	45.3		
Academic M.	752	336	44.7	66.0	65.1
Professional M.	128	47	36.7	11.2	9.1
Doctorate	260	133	51.1	22.8	25.8
Men	589	273	46.3	51.7	52.9
Women	551	243	44.1	48.3	47.1

Source: Prepared by the authors.

The sample comprised 516 respondents, 273 (52.9%) male, and 243 (47.1%) female, with an average age of 32.5 years, a standard deviation of 8.4 years, a median of 31 years, and a mode of 25 years. Most participants (82.7%) are between 21 and 40 years old. The age groups ranging from 21 to 30 years and from 31 to 40 years together concentrate 297 of the 336 respondents enrolled in an academic master's degree, 196 in the first, and 101 in the second, totaling 57.6% of the sample. It is also observed that the two aforementioned age groups together concentrate 105 of the 133 respondents enrolled in doctorate, with 48 in the first and 57 in the second, totaling 20.3% of the sample. It can also be seen that the age groups from 31 to 40 years and 41 to 50 years together concentrate 31 of the 47 respondents enrolled in professional master's degrees, 13 in the first, and 18 in the second, totaling only 6% of the sample. In a way, this reality is corroborated by the Graph in Figure 3, which shows the distribution of respondents by gender and age group.

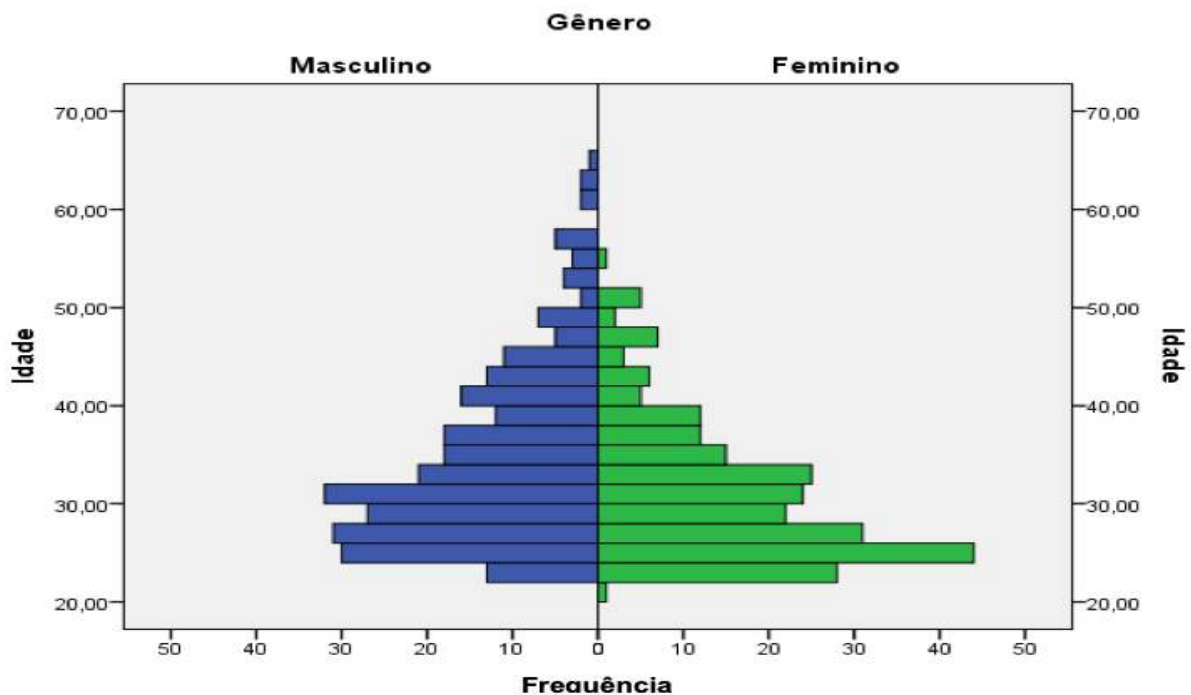


Figure 3. Distribution of the research sample by gender and age group

Source: Prepared by the authors.

In Figure 3, it can be seen that women enter the master's and doctoral programs earlier. Indeed, as age advances, this frequency decreases, unlike what happens with men, more present in the range of 25 to 40 years old.

4.2 Characterization of the sample by self-regulated learning strategy

Table 2 identifies the self-regulated learning strategies used by the participating students. The last two columns show the totalization of the frequencies for responses lower than three and higher than three (midpoint between 1 and 5).

Table 2
Self-regulated learning strategies

Strategy		1	2	3	4	5	<=	
		Never				Always	3	> 3
E1 Self-assessment	Fi	4	7	60	169	276	11	445
	Fi%	0.8	1.4	11.6	32.8	53.5	2.2	86.3
E2 Organization and transformation	Fi	8	36	96	196	180	44	376
	Fi%	1.6	7.0	18.6	38.0	34.9	8.6	72.9
E3 Setting goals and planning	Fi	34	109	150	131	92	143	223
	Fi%	6.6	21.1	29.1	25.4	17.8	27.7	43.2
E4 Search for information	Fi	6	25	54	155	276	31	431
	Fi%	1.2	4.8	10.5	30.0	53.5	6.0	83.5
E5 Taking notes	Fi	23	74	108	163	148	97	311
	Fi%	4.5	14.3	20.9	31.6	28.7	18.8	60.3
E6 Environmental structure	Fi	20	50	100	177	169	70	346
	Fi%	3.9	9.7	19.4	34.3	32.8	13.6	67.1
E7 Self-consequences	Fi	211	123	88	61	33	334	94
	Fi%	40.9	23.8	17.1	11.8	6.4	64.7	18.2
E8 Repetition and memorization	Fi	41	84	131	150	110	125	260
	Fi%	7.9	16.3	25.4	29.1	21.3	24.2	50.4
E9 Seeking external help	Fi	4	27	64	164	257	31	421
	Fi%	0.8	5.2	12.4	31.8	49.8	6.0	81.6
E10 Review	Fi	8	29	88	224	167	37	391
	Fi%	1.6	5.6	17.1	43.4	32.4	7.2	75.8

Source: Prepared by the authors.

The midpoint of the scale presented in the SRLS data collection instrument corresponded to number three. In this research, it is understood that the learning strategies are above this point. That is, below the midpoint, this study considers the strategy adoption as low. It should be noted that the strategies Goal setting and planning (E3) and Self-consequences (E7) are the least used. Only 43.2% and 18.2%, respectively, of the respondents, scored points higher than 3. The other responses have a sum of frequencies greater than 50% for responses greater than 3. The three most employed self-regulated learning strategies were Self-Assessment (E1), Search for information (E4), and Seek external help (E9).

Figure 4 shows absolute numbers that indicate the adoption of a certain strategy above the midpoint (greater than 3), with values that can vary from 0 (no respondents) to 516 (total number of respondents). It is noticed that at the center, tending to zero, are the less adopted strategies (Self-consequence, Goal setting and planning, and Repetition and memorization) and tending off the radar, the strategies most used by the participants (Self-assessment, Search for information, Seeking external help, and Review). These results indicate that the participants have an independent learning profile, which seeks to build their own knowledge, with the ability to assess themselves. However, little is planned, and they are not concerned with the consequences of their decisions. The findings indicate that behavioral strategies influence more than personal strategies in the self-regulated profile of the sample.

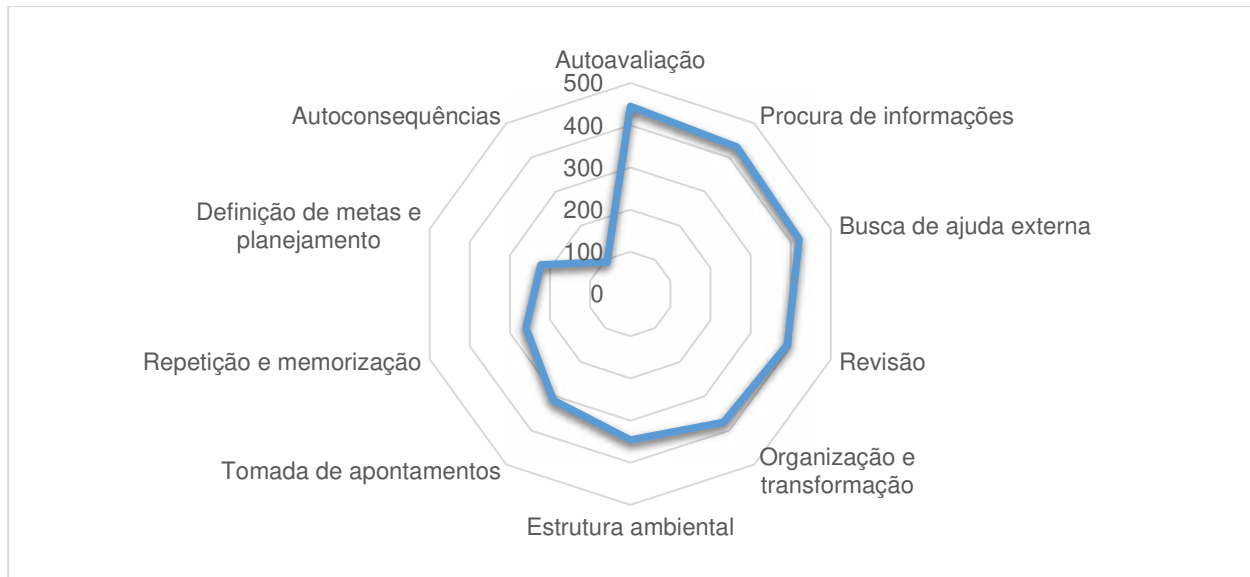


Figure 4. Radar - Self-regulated learning strategies

Source: Prepared by the authors.

Previous studies have shown similar results. While this study identified that the most adopted SRL strategies were Self-Assessment, Search for Information, and Seeking External Help, Lima Filho *et al.* (2015) identified undergraduate students in Accounting Sciences the strategies Self-Assessment, Environmental Structure, and Seeking external help, while Virtanen and Nevgi (2010) detected in Finnish university students the strategies Self-Assessment and Search for Information.

Table 3 presents three SRL learning strategies that showed a frequency higher than 50%, stratified by gender and grouped ages, indicating mean and standard deviation, respectively.

Table 3
Stratified learning strategies

	SRL		
	Self-assessment	Search for information	Seeking external help
21 to 30 years old	4.35 (0.80)	4.19 (1.03)	4.22 (0.90)
31 to 40 years old	4.29 (0.88)	4.36 (0.90)	4.34 (0.83)
41 to 50 years old	4.50 (0.63)	4.50 (0.66)	4.15 (1.10)
51 to 60 years	4.38 (1.12)	4.15 (0.90)	4.08 (1.04)
Over 60 years	4.33 (0.57)	3.33 (1.53)	4.67 (0.57)
Male	4.33 (0.80)	4.26 (0.92)	4.12 (0.95)
Female	4.43 (0.71)	4.44 (0.82)	4.49 (0.76)

Source: Prepared by the authors.

Regarding age, it is noted that older students presented the highest averages, concentrating the Self-Assessment and Information Seeking strategies up to 50 years and the Seeking External

Help strategy above this age group. Regarding gender, women showed to be more self-regulated, with higher means and smaller standard deviations.

The results of the chi-square tests in Tables 2 and 3 showed desirable levels of significance, which corroborates the acquiescence of the results indicated in this topic.

4.3 Multivariate data analysis

To identify and validate the factors underlying the self-regulated learning strategies of students in stricto sensu Accounting programs in Brazil, the research data were processed in two distinct phases, according to the learning strategies under study. In the first, identifying the factors that occurred from the processing of the Exploratory Factor Analysis (EFA), with the aid of the application *Statistical Package for Social Sciences* (SPSS). In the second phase, the validation procedures for the dimensions identified in the previous phase were adopted, with the aid of the *SmartPLS* software.

In the first phase, two EFA processes were carried out, the first with the proposed statements to capture self-regulated learning strategies, which resulted in the extraction of two factors, with a total explained variance of 68.45%, as shown in Table 4.

Table 4
Factors resulting from self-regulated learning strategies

	FACTORS	
	Behavioral strategies	Personal strategies
Self-regulated learning strategies		
After completing an academic paper, I review it to make sure it is correct.	.790	
I assess my performance, see how I can improve to prepare myself for an evaluation.	.417	.342
Before starting an academic work, I always use the library and other research resources (physical or digital) to obtain the maximum information on the subject.	.346	.219
When difficulties arise that I cannot solve on my own, I seek outside help (professor, colleagues, others)	.275	.223
If I have a test, I start studying as soon as possible, to be rested and calm on the day of the test.	.277	.595
I try to make a plan before starting a task or academic activity.	.396	.410
I use strategies to memorize information or formula, until I get it.	.208	.388
I try to write down as much of a text as I read or of a professor's lecture.	.304	.382
When I take a test, if I do well, I offer a reward (I go to the cinema, I have a snack); if the opposite happens, if I fail, I give up something I want.		.362
For better concentration, I always work in an environment that does not offer distractions.	.196	.348
Variance Explained	28.49%	39.96%
Extraction Method: Generalized Least Squares.		
Rotation Method: Varimax with Kaiser Standardization.		

Source: Prepared by the authors.

The adequacy indices KMO = 0.813 and Bartlett's sphericity test ($\chi^2 = 628.82$; sig = 0.000) revealed an excellent level of adequacy in the processing of EFA, according to the parameters suggested by Hair et al. (2009). In the first factor, statements related to behavioral strategies were

grouped, with an explained variance of 28.49%. In contrast, in the second factor, statements related to personal strategies were collected, with an explained variance of 39.96%.

In the second phase of the second stage of data processing, the construct was validated using Confirmatory Factor Analysis (CFA), with the processing of data modeling in structural equations using the partial least squares method (MEE-PLS), by the *Path Weighting Scheme* algorithm, with *missing values* replaced by the mean value and normalization (Mean = 0; Variance = 1), starting with the dimensions obtained for strategies and self-regulated learning, as shown in Figure 5.

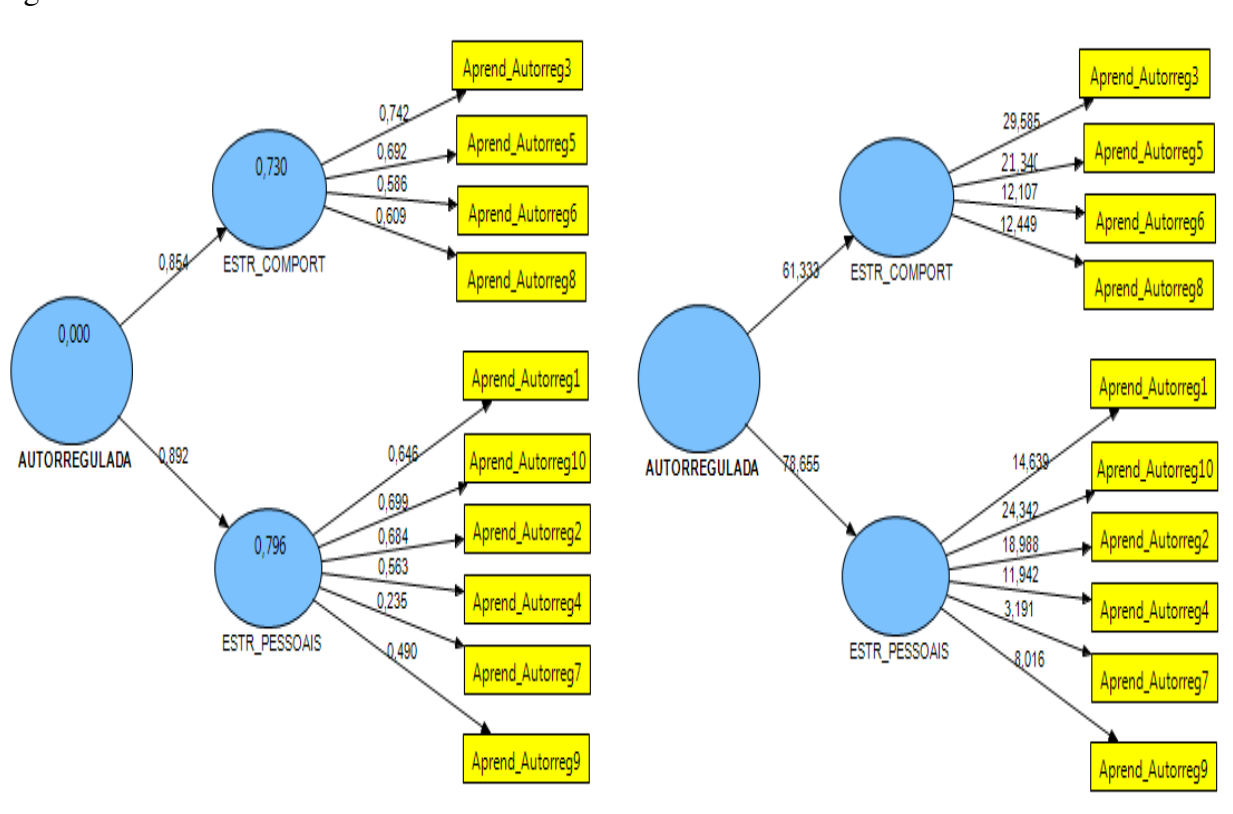


Figure 5. Processing of self-regulated learning strategies

Source: Prepared by the authors.

On the left side of Figure 5, the MEE-PLS processing results are represented with the factors of the self-regulated learning construct “SELF-REGULATED”, while on the right side are the *Student t* statistics obtained in the *bootstrapping* procedure with 500 repetitions. As noted, all factor loadings showed *Student t* statistics above the minimum level of 1.96, recommended by Hair *et al.*(2009).

Therefore, all statements differ significantly from zero to the level of 5% of significance, including the statement “Aprend_Autorreg7 - When I take a test, if I do well, I offer myself a reward (I go to the cinema, I make a snack); if the opposite occurs, if I fail, I give up something I want”, which presented a low factor load ($| \lambda | = 0.235$; $t = 3.191$). Nonetheless, it was maintained for the next analyses because it presents a *Student t* statistic above 1.96.

The value of the average variance explained obtained for the self-regulated learning construct (AVE = 0.9345), combined with the factor loadings resulting from the MEE-PLS processing, indicates that the self-regulated learning strategies construct gathers convergent validity.

The reliability analysis of this construct and its dimensions was assessed using the measures of composite reliability (CR), whose values were: “SELF-REGULATED” (CR = 0.7923), “ESTR_COMPORTE” (CR = 0.7538) and “ESTR_PERSONAL” (CR = 0.73268). Therefore, it is registered that these values were above the 0.7 level, recommended by Chin (1998),

Fornell and Larcker (1981), and Hair *et al.* (2009). Therefore, the indicators can be considered reliable to measure the respective constructs.

The discriminant validity was assessed by comparing the correlation loads between the constructs with the roots of the average variance extracted (AVE) of each construct, indicated in bold in the main diagonal of the correlation matrix in Table 5.

Table 5

Correlation matrix of the “Self-regulated” construct

	SELF-REGULATED	ESTR_COMPORT	ESTR_PERSONAL
SELF-REGULATED	0.934540		
ESTR_COMPORT	0.854305	0.660193	
ESTR_PERSONAL	0.892441	0.527918	0.575328

Source: Prepared by the authors.

As shown in Table 5, the value of the AVE's root for each dimension exceeds the values of the correlations between the constructs. Therefore, the correlations between the indicators and their respective dimensions are stronger than the correlations between the dimensions. Therefore, the self-regulated learning construct has discriminating validity (Kubo & Gouvea, 2012). It is also observed that the self-regulated learning construct explains 73% of the variability of the indicators of the behavioral strategy constructs and 79.6% of the personal strategies. These two constructs reflect self-regulated learning and, therefore, can be used to measure it reflexively.

4.4 Analysis of proposed associations

The dimensions of the self-regulated learning strategies of *stricto sensu* postgraduate students in Accounting in Brazil were identified and validated. In this stage, we sought to test the hypotheses proposed in this study.

To verify the relationship between self-regulated learning strategies and age/gender, the scores of these constructs, produced in the MEE-PLS processing, were submitted to descriptive analysis to check *outliers*, normality test, and, later, hypothesis test.

H1 proposed to assess whether the older the participant is, the higher their SRL level will be. For this purpose, the following null hypothesis was formulated:

H1₀ There is no influence of age on the self-regulation level.

The influence of age on self-regulated learning profiles was tested with the processing of simple linear regression. As shown in Table 6, the impacts of age were positive ($\beta_a = 0.040$; sig = 0.370), but it was not significant at the level of 5%.

Table 6

Results of Simple Linear Regression processing

Model	Non-standardized coefficients		Standardized coefficients		Sig.	Correlations			Collinearity statistics	
	B	Standard error	Beta	t		Zero-order	Partial	Part	Tolerance	VIF
a. (Constant)	-.141	.176		.802	.423					
Age	.005	.005	.040	.897	.370	.040	.040	.040	1.000	1.000

Source: Prepared by the authors.

Therefore, age does not significantly influence the self-regulated learning scores since the p-values were higher than the level of significance. Therefore, the null hypothesis was accepted.

However, previous studies (Castel, Murayama, Friedman, & McGillivray, 2013; Mayville, 2007; McDonough, 2006; Miles & Stine-Morrow, 2004) that supported this hypothesis, in the

context of this research, no evidence was found for its confirmation. The high segregation may have influenced this evidence in the types of courses (academic master's, professional master's, and doctorate) of participants in specific age groups. In other words, as there was a concentration in certain age groups in the three types of courses analyzed, age dispersion was compromised, which may have affected the differences in means, making them non-significant. Besides the possibility of concentration of participants in specific age groups, another possible explanation for this phenomenon is to consider that SRL strategies are only possible to be developed up to a certain age group. That is, after adulthood, it is unlikely to stimulate these strategies. As the base of the referenced studies found evidence that more mature adults had better levels of SRL in relation to young people/younger adults, it is believed that the type of participant in this study promotes some type of exceptionality in this variable, and therefore cannot find significant differences between age and SRL.

Despite not corroborating the hypothesis, these findings are excellent evidence, as it indicates that regardless of age, master's and doctoral students do not differ in terms of learning strategies.

H2 assessed to examine whether there are significant differences between men and women in relation to SRL levels. The following null hypothesis was formulated for statistical analysis:

H2₀: There is no gender influence on the self-regulation level.

The influence of gender on self-regulated learning profiles was assessed by processing the independence test of means. The results in Table 7 indicate that self-regulated learning strategies showed homogeneity of variances according to gender ($F = 2.355$; $\text{sig} = 0.126$).

Table 7
Averages of self-regulated strategies by gender

		Levene's Test for Equal Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (two-tailed)	Difference of Means	Standard Error Difference	95% confidence interval	
									Lower	Upper
Self-regulated strategies	Assumption of equal variance	2.355	.126	-3.929	508	.000	-.34079	.08674	-.51122	-.17037
	Non-assumption of equal variance			-3.950	506.59	.000	-.34079	.08628	-.51030	-.17129

Source: Prepared by the authors.

Women have an SRL level about 34.1% higher than that of men. Buss (1995) and Bussey and Bandura (1999) found evidence that gender influences SRL levels. The results of this study corroborate the referenced literature. These results did not reject H2 and indicate that the gender effect influences self-regulated learning. Future studies may consider gender diversity, which in this research was only considered (Male/Female).

5 FINAL CONSIDERATIONS

This research related the self-regulated learning strategies used by the participants of a sample and the impulse of age and gender in the learning profile of Brazilian students of master's and doctorate in Accounting.

For that, a data collection instrument was applied to measure the variables and the key construct of this research: self-regulated learning. The applied instrument (SRLS) exhibited

convergent and discriminating legitimacy based on a Structural Equation Model, which made it possible to validate self-regulated learning strategies in accounting postgraduate students. Responding to the research problem, the proposed objective, and the hypotheses outlined, it was identified that only the variable gender significantly influences the SRL.

The developments and contributions of this research drive adequate and updated theoretical references for the empirical research that the study proposes to address, involving age and gender in the context of self-regulation for learning, thus stimulating a theoretical and academic advance relevant to the theme. As practical implications, empirical findings can help professors, students, researchers, educational institutions, and postgraduate programs to understand the aspects of self-regulated learning that characterize master and doctorate students in Accounting.

The limitations of our study are highlighted, which can be understood as opportunities for future research. Initially, the study used a specific audience: master and doctorate students from an area of knowledge. Future research intricately discussed in the discussion proposed in this study may develop a horizontal comparative study, with students from different areas of knowledge, or a vertical study, involving Accounting students, from undergraduate to doctoral programs. As highlighted by Kimura (2015), research may present a common method bias, with possible discrepancies in the data; other methodological strategies, such as, for example, a quasi-experiment, could be designed to reexamine the associations investigated in our study.

Another important limitation was the relatively low participation of professional master's students (36.7%). Future studies may choose other dynamics to invite these types of respondents or even include only academic professors and doctoral students in the study's proxy trait.

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