Graduate Student Differences in Self-Determined Learning: an Analysis Relating Age Group and Sex to Strategy Use

Abstract

Objetive: discussions about the Self-Determination Theory have been more frequent lately in the field of education. This theory highlights the importance of student motivation as a source of immediate satisfaction in academic tasks. The goal of this study is to explore and analyze the Motivated Strategies for Learning Questionnaire (MSLQ), validated by Structural Equations Modeling and, additionally, to verify whether age or sex affect the level of self-regulated learning of Master's and PhD Accounting students in Brazil.

Method: the operation model of the research outlined the formulation of two hypotheses arguing in favor of the influence of the variables age and sex on the Self-Determination (SDT) levels of the study participants.

Results: these hypotheses, though, were not supported by the results of the multivariate data analysis, which is an interesting diagnosis as the studied variables did not indicate statistically significant relevance. These results suggest that other variables - such as which point in the course they have reached or which kind of educational institution they are studying at – need to be analyzed.

Contributions: important limitations of this research can be seen as opportunities for future research: the sample was taken from a specific public; the survey may exhibit common method bias; and there was low participation of Professional Master's students. Future studies may adopt different methodological strategies and/or engage more diverse samples or follow the students for a longer time. As practical implications, the empirical findings can help teachers, students, researchers, educational institutions and graduate programs understand the aspects of self-determined learning that characterize Master's and PhD students in Accounting.

Keywords: Self-determined learning. Accounting education. motivation.

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1. Introduction

The Self-Determination Theory (SDT) argues that every person has the innate tendency to grow and develop towards the full optimization of their potential. For that purpose, the fulfillment of three basic kinds of psychological necessity is needed: autonomy needs, competency needs and relationship needs (Deci & Ryan. 2000). SDT arose in the seventies out of studies about motivation in human behavior. It argues that every person has positive traits known as "inherent growth tendencies". That is, each person is intrinsically imbued with proactivity, talents and potentials towards intellectual growth. It is important to note, however, that even if these tendencies are inherent, they are not automatic, which makes it necessary that intrinsic and extrinsic factors promote their development. The theories that preceded SDT indicated that learning can be promoted via motivational stimuli.

The current scenario of professional performance stirs the academic community with the expectation that students (future professionals) become individuals who are adaptable to the transformations and demands of the job market and professional world, as well as critical and participative citizens [AAA] (2012). In the light of the present context involving the accounting profession, accounting education has taken up the challenge of keeping up with the changes in the professional and social context and of contemplating an education that stimulates the adoption of self-determined learning strategies. Thus, paying attention to these students' learning became the main concern in order to reach these goals. For Tuysuzoglu (2011), the purpose of education should not be the mere accrual of knowledge but, most importantly, to increase the awareness of learning abilities.

Educational research in the last decades has defended the promotion of motivational attitudes in students during the teaching-learning process. Particularly in accounting, the changes demanded by the convergence of Brazilian standards toward international regulations have sparked discussions in the educational context. On the other hand, social demands about the profession, in the sense of fulfilling the informational needs of a broader and more diffuse audience, have made the current professional context more complex than the one the "book-keepers" used to experience. Therefore, accounting professionals need to adopt a critical posture and take up the role of apprentices (Smith, 2001). Facing this demand, the accounting profession has required from the scientific community - and especially from educational research in the area - perspectives related to preparing the students for professional life, especially in the activities of learning, judging decision alternatives, retaining abilities and seeking knowledge (Martin & Dowson, 2009; Schleifer & Dull, 2009).

Facing 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 education that leads accounting students to adopt permanent learning attributes and skills. The American Accounting Association [AAA] (2012), in turn, indicates seven recommendations on the teaching of the accounting profession: building a learned profession for the future; flexible pedagogies and faculty formation; critical teaching; curricula involving learning resources; attracting high-potential candidates into the profession; mechanisms for disseminating information about current and future markets; and strategies for converting thought into action. Note that these recommendations are directly related to the discussion in this research, which bases its proposal on continued education with the goal of integrating accounting research, education and practice.

Some educational researchers assert that there are expressive differences between self-determined students and those who need external regulation of their learning (Arias, Lozano, Cabanach, & Pérez, 1999; Richter & Schmid, 2010; Xu, Benson, Mudrey-Camino, & Steiner, 2010). Students who do not self-regulate lack well-outlined educational goals and thus have a greater cognitive dependency (Zimmerman, 2001). Self-determined students, in turn, are motivated and flexible, which provides the necessary profile to develop competencies (Ryan & Deci, 2000). Thus, self-determination in learning is an innate tendency for the pursuit of challenges and the learning of new skills. And accordingly, the lack of self-determination in the learning process results in difficulties to develop and conclude activities and tasks, as well as in dependency on external agents for the conclusion of these tasks.

From this context arises this study's perspective of exploring and analyzing the levels of self-determined learning of Brazilian Accounting students in Master's and PhD programs. This analysis will use the MSLQ, in addition to examining whether age or sex affects the level of self-determined learning. Therefore, the goal is to answer the following research problem: What is the relationship between age and/or sex and the level of self-determined learning? The results of this research are relevant to the teaching of accounting, given the importance of studying 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 formation of new professionals in the area.

Rausch (2012) discusses the role of postgraduate programs in faculty education from the perspective of trade trainers and of acting in scientific research. The author concludes by highlighting the important role of the teacher-researchers, as they are responsible for making the teacher a producer of knowledge and not merely a replicator. That is, faculty education has to be geared not only towards acting in the educational field, as defended by Fiorentini (2004), but in scientific research as well.

Araújo, Lima, Oliveira and Miranda (2015) mapped the main issues faced by accounting teachers in the beginning of their career and in the subsequent stages of academic career. One of the identified challenges was lack of student motivation. This prognosis justifies the scope of this study's proposal, given not only the impact of the adoption of the international accounting rules (IFRS) on the profession and the teaching/learning of accounting in Brazil, but also the recent growth in the supply of undergraduate and graduate accounting in the country.

This paper is organized as follows: next, we discuss our theoretical framework, positioning the state of the art in the topic. Then, our methodological procedures are presented, as well as the limitations of our study. In the next step, we explore our data, starting with statistical data analysis, using factor analysis and structural equation modeling, and ending with a regression analysis. Finally, we present our final considerations, outlining possibilities of future research.

The sample comprised 516 respondents, being 273 (52.9%) male and 243 (47.1%) female. The average age was 32.5 years old, with a standard deviation of 8.4, median of 31 and a mode of 25 years old. Most students (82.7%) were between 21 and 40 years old. The descriptive statistical analysis shows that females entered academic Master's and PhD programs earlier than males and were the majority in these types of courses up to the age of 30 years old, after which males were more numerous. For the professional Master's courses, male presence was balanced across all age ranges. In this type of program, participants had an average age of 40 years old, significantly superior to the average age of men in academic Master's programs (25 years old). Extrinsic stimulus strategies, anxiety during exams and learning control were the least used learning strategies. From our research outcomes, we highlight the following self-determined strategies as prevalent: interest in the content, extrinsic stimulus and self-confidence. For all the variables related to SDT, PhD students presented higher levels than Master's students. Regarding age, the results were not conclusive for any of the strategies. On the other hand, in relation to sex, women presented themselves as more self determined, showing higher means and lower standard deviations. Based on hypothesis testing results, age does not significantly influence SDT learning scores and the SDT learning strategies scores do not differ significantly between the sexes.

2. Theoretical Framework

Considering the need for a theoretical evolution that enables the handling of newer learning paradigms, the Self-Determination Theory was developed by Deci and Ryan (1985) on the basis of motivation, and highlights that people tend to be stimulated towards learning by needs for satisfaction and personal development. The authors anchored themselves in White's (1975) study to understand a person's need to feel capable, and on DeCharms's (1984) presuppositions that the locus of causality in relation to a certain learning result stems from internal and modifiable factors and therefore depends on the subject themselves.

The initial premise of SDT affirms that people seek activities related to their internal growth process, which leads them to accept challenges and seek new experiences as a form of maintaining the integrity of the self. From this angle, learning would be what makes sense for a maturing subject, as it would be linked to the motivation to take up tasks and activities (Brockelman, 2009). Therefore, SDT is characterized as one of the theories of human motivation.

Motivation is the term used to describe the efforts that people spend to accomplish certain activities (Schermerhorn, 2007). In Pfromm's (1987) understanding, motivation rouses the human organism and guides its actions to achieve pre-established goals. Murray (1986, p.20) explains that motivation represents "an internal factor that begins, guides and integrates a person's behavior." According to Robbins (2005, p.151), motivation may be defined as "the process responsible for the intensity, duration and persistence of a person's efforts towards the achievement of a certain goal."

Warken and Biavatti (2013) studied the motivations of accounting scholars from the perspective of SDT in order to investigate their motivational levels, the difference in motivation between entrants and graduates and the relationship between those and dropout rates. The authors applied an Academic Motivation Scale questionnaire to a sample of 83 students. In addition to identifying their levels of intrinsic and extrinsic motivation, the instrument also measured their demotivation levels, an arguably important aspect for actions that seek to prevent dropout. Weighted averages were calculated, permitting the verification of the consistency in the answers and the differences in motivational levels between the groups of scholars studied. The results showed intrinsically motivated students with a slight drop in extrinsic motivation in students of the sixth and eighth periods, which shows an oscillation in the motivational level from the beginning to the end of the course that, though small, might influence the dropout rates.

In an analogous study, Leal, Miranda, and Carmo (2013) also used the SDT perspective to evaluate the motivation of accounting students from a Brazilian public institution. Their sample comprised 259 students distributed by academic terms. The results were subject to Exploratory Factor Analysis, revealing seven factors that explain 61.1% of the data's total variability. The results were partially convergent with those found in previous studies and, in addition, evidenced a sizable diversity in learning motivation among the sample students. On the one hand, some students showed concerns with deepening their knowledge level or gaining a stable basis to achieve good performance in the exercise of their future profession; on the other, there were students concerned only with obtaining a degree, or who saw class attendance merely as a way to achieve minimum attendance levels. It is relevant to note that the study results evidence the importance of understanding and evaluating students' motivational levels, as that makes it possible to plan ways to encourage and explore motivation in academic environments.

In the same way as the two previous studies, Oliveira, Theóphilo, Batista, and Soares (2010) studied, through the SDT, the motivation levels of 2008 students of the accounting course at a Brazilian public university. They applied the Academic Motivation Scale. The results, presented through descriptive statistics, indicated high levels of motivation among the participants. Note, though, that senior students showed lower averages.

Oliveira *et al*., (2010), Leal, Miranda, and Carmo (2013) and Warken and Biavatti (2013), highlight the relevance of discussing SDT in Accounting, positioning it as a relevant theme. The outcomes of their research led to the proposition of one of our methodological hypotheses, also helping to establish the boundaries of our study proposal.

Ferreira (2013) described and analyzed the ways in which intrinsic and extrinsic aspirations manifest in the employees of small and medium businesses. The author conducted a field research with 412 industry, commerce and services workers from three capital cities in the Brazilian Northeast (Fortaleza, São Luís and Teresina). The research instrument comprised the Aspiration Index, originally proposed by Ryan (1995); and sociodemographic questions, which were used in the characterization of respondents, providing a database for testing the hypotheses raised. The results indicated that workers in small and medium businesses are more oriented by intrinsic life goals. It was also noted that aspirations are influenced by sex, age group and education level. A negative correlation was found between extrinsic aspirations and monthly family income. Based on the collected data, a motivational profile of the workers was created, which did not show relevant differences in perception regarding aspirations. Generally, the workers ascribe importance to their aspiration, but they do not put as much faith in the idea that they will be able to achieve them.

Falcão and Rosa (2008) also applied the Academic Motivation Scale to university students from public and private universities in Rio de Janeiro, analyzing variables such as type of institution, school term and student sex. They concluded that private college students are more motivated but that their motivation level decreases as they near the end of the course. The opposite appears in the students of public institutions, who enter the course with low motivation but show an increase over time. Women displayed higher levels of intrinsic motivation, while men had higher extrinsic motivation levels. These results reveal that sex may impact students' levels of motivation and other factors that influence those levels.

Similarly, Castro, Miranda and Leal (2015) considered the adoption of learning strategies, learning motivation, and the relationship between these two variables in accounting students from a Brazilian public university. The study applied Santos, Boruchovitch, Primi, Bueno and Zenorini's (2004) Scale of Learning Strategies and Neves & Boruchovitch's (2007) Scale for the Evaluation of Learning Motivation and concluded, via a factor analysis, that there is a significant relationship between intrinsic motivation and the use of learning strategies or, in other words, that motivated students study of their own accord, which directly influences their academic performance.

Involving the variables of this study and in line with the last two studies cited, McDonough (2006) investigated how age relates to motivation, behavior and affective experiences within the context of SDT. By comparing 558 people based on Deci & Ryan's (1985) presuppositions, the study concluded that age is an excellent predictor of self-determined motivations, indicating that younger people are more motivated. Austin, Senecal, Guay and Nouwen (2011), on the other hand, analysed how sex affects learning. Based on Structural Equations Modeling (SEM), the results indicate that women have higher levels of intrinsic motivation and self-efficacy.

All the results of the previous studies point to the pertinence of our research and anchor the proposition of the hypotheses that we will present.

3. Methodological Procedures

This research is characterized as a survey, that is: the acquisition of data - usually via a survey - or information on the attributes, actions or judgments of a certain group of people that is chosen to represent a target population (Pinsonneault & Kraemer, 1993). As basic properties of the data collection method, we highlight the goal of producing quantitative definitions of a population and the use of a predefined instrument.

Kimura (2015) affirms that, usually, in studies that involve variables of a personal nature like leadership, satisfaction and motivation, answers collected by a data collection instrument may indicate common method bias (CMB). Some recent studies indicate, however, that despite being able to cause discrepancies in data, CMB introduces minimal biases that do not substantially alter the results (Schaller, Patil, & Malhotra, 2015).

In a survey, every respondent is participating of their own accord, which may indicate eventual biases in the answers and the probable non-representation of the target population (self-selection bias). To circumvent the possibility of data limiting, this study sought to frame a large sample and to employ quantitative methods that evaluate the certainty of the inference and analysis of data. For that end, we adopted structural equations modeling, which is a set of techniques and procedures used in conjunction to examine relationships between variables.

The main stages of a survey research result in the definition of the population and of the sample. In this study, the population joins Master's and PhD students associated with accounting programs recommended in 2015 by the Coordination for the Improvement of Higher Education Personnel (Capes), a Ministry of Education (MEC) foundation that plays a fundamental role in the expansion and consolidation of *stricto sensu* (Master's and PhD) postgraduate programs in every Brazilian state.

There are currently 25 Capes-approved and recognized programs operating in the country (one was discontinued and should be extinct after the conclusion of ongoing courses), 24 of those being academic Master's programs, three professional Master's programs and 13 PhD programs.

The population of this study consists of 1,140 students linked to the various postgraduate accounting programs offered by public and private institutions throughout the country, being 752 academic Master's programs, 128 professional Master's programs and 260 PhD programs.

The Motivated Strategies for Learning Questionnaire (MSLQ) was developed by Pintrich & De Groot (1990) through the adaptation of a number of psychometric instruments meant to evaluate students' self-regulation through cognitive and metacognitive strategies. Pintrich, Smith, Garcia, and McKeachie (1993) revised MSLQ with the goals not only of validating it but also testing its reliability. The instrument consists of 31 positive statements, with respondents rating each one through a scale ranging from 1 (completely disagree) to 5 (completely agree), expressing their level of agreement. Figure 1 presents the instrument.

#	Statements
1	In a class like this, I prefer course material that really challenges me so I can learn new things.
2	If I study in appropriate ways, then I will be able to learn the material in this course.
3	When I take a test, I think about how poorly I am doing compared with other students.
4	I think I will be able to use what I learn in this course in other courses.
5	I believe I will receive an excellent grade in this class.
6	I'm certain I can understand the most difficult material presented in the readings for this course.
7	Getting a good grade in this class is the most satisfying thing for me right now.
8	When I take a test, I think about items on other parts of the test I can't answer.
9	It is my own fault if I don't learn the material in this course.
10	It is important for me to learn the course material in this class.
11	The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.
12	I'm confident I can learn the basic concepts taught in this course.
13	If I can, I want to get better grades in this class than most of the other students.
14	When I take tests, I think of the consequences of failing.
15	I'm confident I can understand the most complex material presented by the instructor in this course.
16	In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.
17	I am very interested in the content area of this course.
18	If I try hard enough, then I will understand the course material.
19	I have an uneasy, upset feeling when I take an exam.
20	I'm confident I can do an excellent job on the assignments and tests in this course.
21	I expect to do well in this class.

#	Statements
22	The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.
23	I think the course material in this class is useful for me to learn.
24	When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.
25	If I don't understand the course material, it is because I didn't try hard enough.
26	I like the subject matter of this course.
27	Understanding the subject matter of this course is very important to me.
28	I feel my heart beating fast when I take an exam.
29	I'm certain I can master the skills being taught in this class.
30	I want to do well in this class because it is important to show my ability to my family, friends. employer, or others.
31	Considering the difficulty of this course, the teacher, and my skills. I think I will do well in this class.

Figure 1. *Motivated Strategies for Learning Questionnaire (MSLQ)*

Source: Adapted from Artino Jr. (2005).

Data analysis will involve: (1) descriptive statistical analysis of the sample; (2) exploratory factor analysis and confirmatory factor analysis in Structural Equations Modeling; and (3) for the hypothesis testing, a linear regression analysis, with age and sex being dependent variables and self-regulated learning level, measured by the MSLQ, being the explanatory variable.

It is good to note that Structural Equations Modeling (SEM), the analysis technique used in this study, is not restricted to studying simultaneous data dependency, though it also provides a transition from exploratory analysis to a confirmatory perspective. The variables involved may be grouped via factor analysis to form the latent constructs. According to Mattson (2012), SEM is a multivariate analysis that demands from the researcher keen accuracy in its conduction, spanning from the elaboration of the model to the empirical tests. This is because it is a method conducted in an orderly manner in which every stage is relevant to the study.

According to Kubo and Gouvea (2012), SEM presents methods for ascertaining validity. The convergent validity that analyzes the correlation of two measures of the same concept is demonstrated by the average variance extracted (AVE) – a value above 0.5 being recommended – and the discriminant validity that evaluates the distinction between two constructs, demonstrated as the square root of the AVE – it is desirable for this value to be greater than the internal correlations of the latent variables. The data analysis of this study adopts these validities in the measuring process in order to attest the absence of sampling errors.

4. Data Analysis

4.1 Characteristics of the Sample

The data was collected and processed with the help of the Statistical Package for Social Sciences (SPSS) application. The descriptive analysis of the data revealed that the programs at the institutions Unioeste, UEM and UFPB registered the three highest proportions between participants and enrolled students (80%, 79.4% and 75%, respectively), while the programs of UPM, UFC and UFPE showed the three lowest proportions (26.8%, 21.3% and 19.4%, respectively).

The sample comprised 516 respondents, being 273 (52.9%) male and 243 (47.1%) female. The average age was 32.5 years old, with a standard deviation of 8.4, median of 31 and a mode of 25 years old. The majority of students (82.7%) were between 21 and 40 years old.

Table 1

Representative sample of the population

Institution	Enrolled (A)	Respondents (B)	% B/A	% A/C (E)	% B/D (F)	F – E
UFC	94	20	21.3	8.2	3.9	-4.3
UnB	30	19	63.3	2.6	3.7	1.1
UnB/UFPB/UFRN	68	23	33.8	6.0	4.5	-1.5
Ufes	37	21	56.8	3.2	4.1	0.9
Fucape	62	30	48.4	5.4	5.8	0.4
UFMG	25	14	56.0	2.2	2.7	0.5
UFPB	20	15	75.0	1.8	2.9	1.1
UFPE	31	6	19.4	2.7	1.2	-1.5
UEM	34	27	79.4	3.0	5.2	2.2
UFRJ	44	27	61.4	3.9	5.2	1.3
UFU	34	22	64.7	3.0	4.3	1.3
UERJ	20	9	45.0	1.8	1.7	-0.1
UFRN	10	4	40.0	0.9	0.8	-0.1
Unisinos	78	27	34.6	6.8	5.2	-1.6
FURB	72	31	43.1	6.3	6.0	-0.3
UPM	41	11	26.8	3.6	2.1	-1.5
Unifecap	56	20	35.7	4.9	3.9	-1.0
PUC/SP	53	18	34.0	4.6	3.5	-1.1
UFBA	36	21	58.3	3.2	4.1	0.9
UFPR	47	25	53.2	4.1	4.8	0.7
Unioeste	15	12	80.0	1.3	2.3	1.0
UFSC	59	27	45.8	5.2	5.2	0.0
UFRPE	15	5	33.3	1.3	1.0	-0.3
USP	116	58	50.0	10.2	11.2	1.0
USP/RP	43	24	55.8	3.8	4.7	0.9
Total	**1.140 (C)**	**516 (D)**	**45.3**			
Academic Master	752	336	44.7	66.0	65.1	-0.9
Professional Master	128	47	36.7	11.2	9.1	-2.1
PhD	260	133	51.1	22.8	25.8	3.0
Men	589	273	46.3	51.7	52.9	1.2
Women	551	243	44.1	48.3	47.1	-1.2

Source: elaborated by the authors (2017).

Comparing the proportions enrolled/population and participants/sample, we verified that there were no significant differences among institutions except for UFC, which showed a difference of 4.3% between the percentages of enrolled students and research participants, and the general population for the other institutions, where the difference ranged from -1.6% to 2.2%. In relation to sex, we observed a balance between the proportions males/population (51.7%) and females/population (48.3%). Therefore, it is evident that the chosen sample is representative of the population, given that there was a balance between the proportions males/sample (52.9%) and females/sample (47.1%).

As for the representativeness of the sample by course type, we verified a significant share of students enrolled in academic Master's (44.7%) and PhD programs (51.1%), while the students of professional Master's courses showed a lower share (36.7%).

In Table 2, we observed that the 21-30 and 31-40 age groups totaled, together, 297 of the 336 respondents enrolled in academic Master's courses, with the former age group totaling 196 and the latter 101, corresponding to 57.6% of the sample.

Table 2

Sample distribution by age and type of course

Age group (in years)	21 a 30	31 a 40	41 a 50	51 a 60	60+
Course					
Academic Master	196	101	30	8	1
Professional Master	12	13	18	3	1
PhD	48	57	20	6	2

The aforementioned age ranges comprised, together, 105 out of the 133 respondents enrolled in PhD courses, being 48 in the former and 57 in the latter, totaling 20.3% of the sample. We also verified that the 31-40 and 41-50 age ranges concentrated, together, 31 of the 47 respondents enrolled in professional Master's courses, being 13 in the former and 18 in the latter, totaling only 6% of the sample.

This is, in a way, supported by the graph presented in Figure 2, which shows the distribution of the respondents by sex and age range.
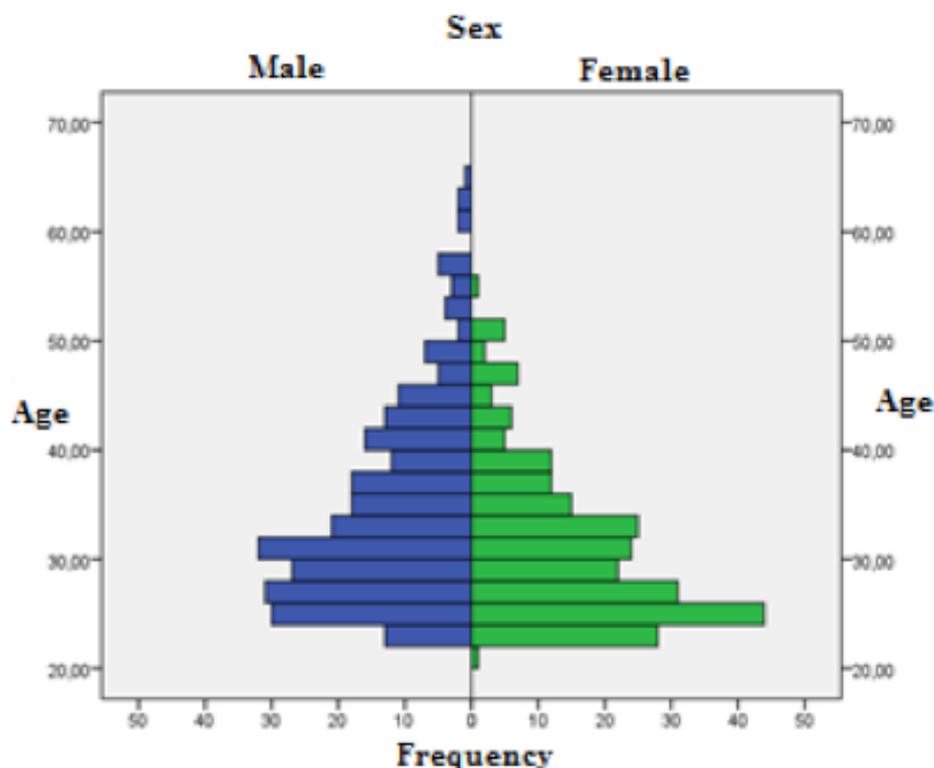

Figure 2. Distribution of research sample by sex and age range

The analysis of Figure 2 shows that females entered Master's and PhD programs earlier than males, and effectively that frequency decreases as age goes up. This did not happen among males, who were more numerous in the 25-40 year-old age range.

The stratified distribution of the respondents in terms of sex and age group by kind of course (academic Master's, professional Master's, PhD) resulted in the graphs presented in figures 3a and 3b.
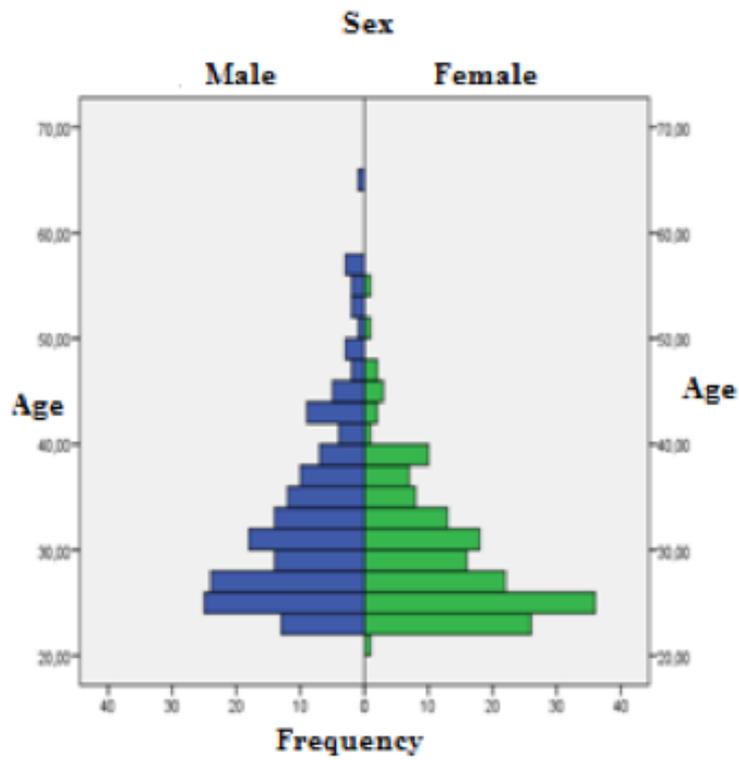
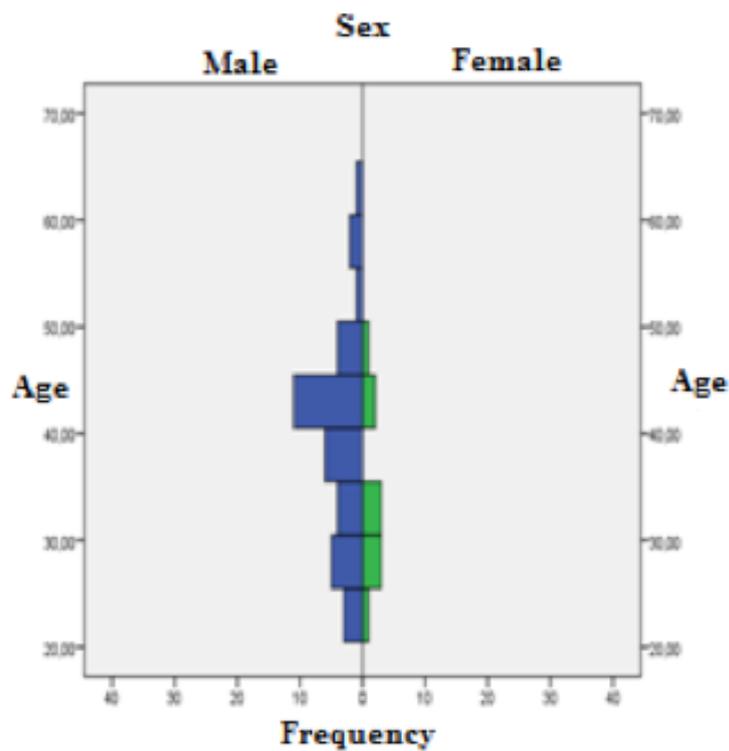**Figure 3a.** Distribution of the sample by sex and age range in academic Master's courses

Figure 3b. Distribution of the sample by sex and age range in professional Master's courses
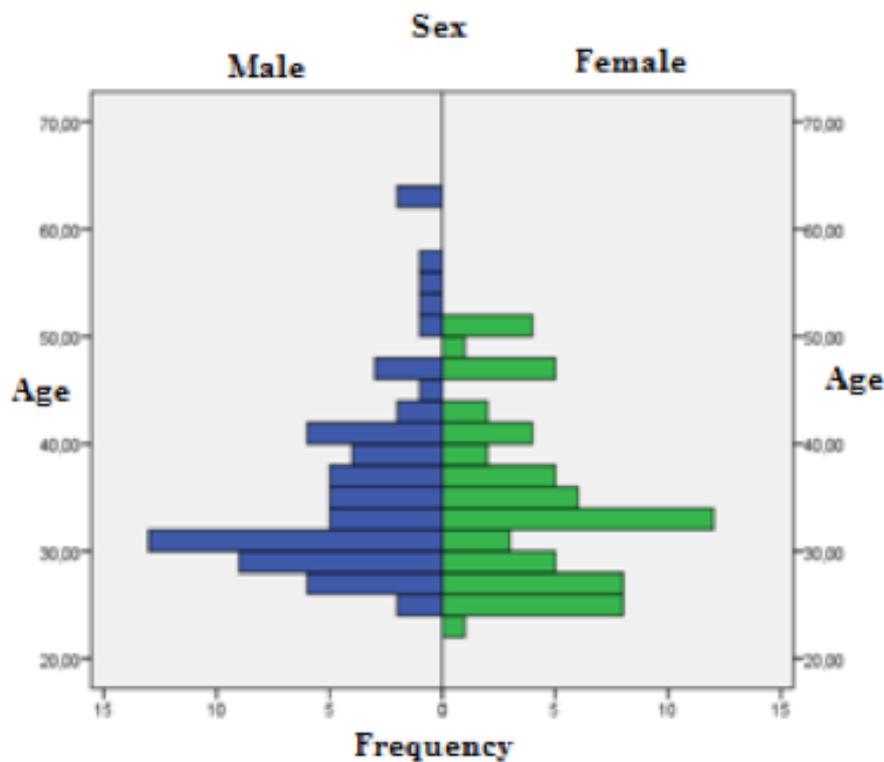
Figure 3c. Distribution of the sample by sex and age range in PhD courses

Source: elaborated by authors

Figures 3a and 3c showed that females entered academic Master's and PhD programs earlier than males and were the majority in these types of courses up to the 30-year-old mark, after which males were more numerous. For the professional Master's courses (Fig. 3b), male presence was balanced across all age ranges. In this type of program, participants had an average age of 40 years old, significantly superior to the average age of men in academic Master's programs (25 years old). This may indicate that professional Master's students await a certain "maturing" of their career before enrolling in that kind of course; academic Master's students, on the other hand, usually enroll just after their graduation.

4.1.1 Characterization of the participants' self-determined learning strategies

Table 3 shows the self-determined learning strategies used by the surveyed graduate students. The last two columns present the sum of the frequencies of responses lower and greater than 3 (the midpoint between 1 and 5).

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Table 3

Self-determined strategies

Strategy		1 Never	2	3	4	5 Always	Less than 3	More than 3
E1 Intrinsic Stimulus	Fi	14	17	85	211	189	31	400
	Fi%	2.7	3.3	16.5	22.5	63.4	6.0	85.9
E2 Self confidence	Fi	3	10	46	196	261	13	457
	Fi%	0.6	1.9	8.9	38.0	50.6	2.5	88.6
E3 Extrinsic Stimulus	Fi	125	102	109	122	58	227	180
	Fi%	24.2	19.8	21.1	23.6	11.2	44.0	34.8
E4 Self confidence	Fi	4	11	50	223	228	15	451
	Fi%	0.8	2.1	9.7	43.2	44.2	2.9	87.4
E5 Self confidence	Fi	9	33	92	220	162	42	382
	Fi%	1.7	6.4	17.8	42.6	31.4	8.1	74.0
E6 Self confidence	Fi	11	44	130	220	111	55	331
	Fi%	2.1	8.5	25.2	42.6	21.5	10.6	64.1
E7 Extrinsic Stimulus	Fi	64	116	128	139	69	180	208
	Fi%	12.4	22.5	24.8	26.9	13.4	34.9	40.3
E8 Anxiety about Exams	Fi	79	120	128	113	76	199	189
	Fi%	15.3	23.3	24.8	21.9	14.7	38.6	36.6
E9 Learning control	Fi	44	110	207	102	53	154	155
	Fi%	8.5	21.3	40.1	19.8	10.3	29.8	30.1
E10 Interest in Content	Fi	3	7	31	159	316	10	475
	Fi%	0.6	1.4	6.0	30.8	61.2	2.0	92.0
E11 Extrinsic Stimulus	Fi	145	123	148	79	21	268	100
	Fi%	28.1	23.8	28.7	15.3	4.1	51.9	19.4
E12 Self confidence	Fi	2	12	27	152	323	14	475
	Fi%	0.4	2.3	5.2	29.5	62.6	2.7	92.1
E13 Extrinsic Stimulus	Fi	64	76	126	122	128	140	250
	Fi%	12.4	14.7	24.4	23.6	24.8	27.1	48.4
E14 Anxiety about Exams	Fi	38	87	98	144	149	125	293
	Fi%	7.4	16.9	19.0	27.9	28.9	24.3	56.8
E15 Self confidence	Fi	10	29	94	220	163	39	383
	Fi%	1.9	5.6	18.2	42.6	31.6	7.5	74.2
E16 Intrinsic Stimulus	Fi	1	18	86	190	221	19	411
	Fi%	0.2	3.5	16.7	36.8	42.8	3.7	79.6

Strategy		1 Never	2	3	4	5 Always	Less than 3	More than 3
E17 Interest in Content	Fi	6	23	72	210	205	29	415
	Fi%	1.2	4.5	14.0	40.7	39.7	5.7	80.4
E18 Self confidence	Fi	9	18	88	210	191	27	401
	Fi%	1.7	3.5	17.1	40.7	37.0	5.2	77.7
E19 Anxiety about Exams	Fi	101	143	107	113	52	244	165
	Fi%	19.6	27.7	20.7	21.9	10.1	47.3	32.0
E20 Self confidence	Fi	6	18	83	237	172	24	409
	Fi%	1.2	3.5	16.1	45.9	33.3	4.7	79.2
E21 Interest in Content	Fi	3	7	27	161	318	10	479
	Fi%	0.6	1.4	52	31.2	61.6	2.0	92.8
E22 Interest in Content	Fi	3	8	34	162	309	11	471
	Fi%	0.6	1.6	6.6	31.4	59.9	61.6	91.30
E23 Interest in Content	Fi	4	11	50	209	242	15	451
	Fi%	0.8	2.1	9.7	40.5	46.9	2.9	87.4
E24 Intrinsic Stimulus	Fi	10	29	131	232	114	39	346
	Fi%	1.9	5.6	25.4	45.0	22.1	7.5	67.1
E25 Learning Control	Fi	29	93	145	167	82	122	249
	Fi%	5.6	18.0	28.1	32.4	15.9	23.6	48.3
E26 Interest in Content	Fi	9	43	123	193	148	52	341
	Fi%	1.7	8.3	23.8	37.4	28.7	10.0	66.1
E27 Interest in Content	Fi	7	7	29	172	301	14	473
	Fi%	1.4	1.4	5.6	33.3	58.3	2.8	91.6
E28 Anxiety about Exams	Fi	79	98	124	133	82	177	215
	Fi%	15.3	19.0	24.0	25.8	15.9	34.3	41.7
E29 Self confidence	Fi	5	23	88	242	158	28	400
	Fi%	1.0	4.5	17.1	46.9	30.6	5.5	77.5
E30 Extrinsic Stimulus	Fi	81	92	121	131	91	173	222
	Fi%	15.7	17.8	23.4	25.4	17.6	33.5	43.0
E31 Interest in Content	Fi	8	5	30	217	256	13	473
	Fi%	1.6	1.0%	5.8	42.1	49.6	2.6	91.7

The median of the MSLQ scale corresponded to number three in the scale. This reveals that the learning strategies adopted by students should be above this point. Examining the strategies, extrinsic stimulus strategies (E3, E7, E11, E13 and E30), anxiety during exams (E8, E19 and E28) and learning control (E9 and E25) were the least used. The other responses' sum of frequencies was higher than 50% for responses higher than 3. We highlight the following self-determined strategies: interest in the content (E10 and E21, E22, E27, E31), extrinsic stimulus (E1, E16 and E24) and self confidence (E2, E4, E5, E6, E12, E15, E18, E20 and E29).

These findings were illustrated in Figure 4, which discloses absolute figures indicating the adoption of a specific strategy above the average point (above 3), with values that can vary from 0 (no respondent) to 516 (every respondent). More and less adopted strategies were highlighted, showing that the respondents anchor their motivation for learning in intrinsic stimulus, that is, interest for the content and the faith that they have the ability to learn it, thus moving the self-determination of their learning away from extrinsic stimuli and evaluative criteria.
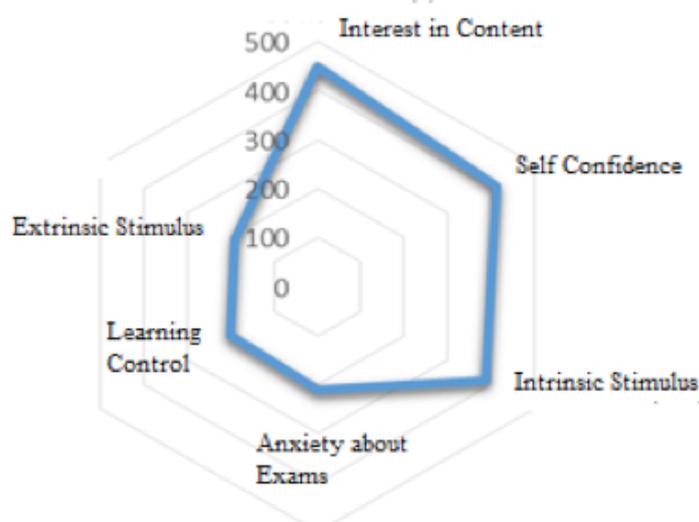

Figure 4. Radar - Self determined strategies

Table 4 presents SDT learning strategies with frequencies above 50%, stratified by course, age groups and sex, showing mean and standard deviation (between parentheses).

Table 4
Stratified Learning Strategies

	SDT				
	Self Assessment	External Help-Seeking	Interest in Content	Extrinsic Stimulus	Self Confidence
Academic Master's Students	4.32 (0.82)	4.25 (0.90)	4.29 (0.59)	3.95 (0.73)	4.08 (0.64)
Professional Master's Students	4.34 (0.91)	4.17 (0.96)	4.40 (0.56)	4.04 (0.66)	4.23 (0.53)
PhD Students	**4.51 (0.67)**	**4.27 (0.95)**	**4.41 (0.40)**	**4.15 (0.57)**	**4.24 (0.54)**
21-30 years old	4.35 (0.80)	4.22 (0.90)	4.27 (0.55)	3.94 (0.67)	4.05 (0.66)
31-40 years old	4.29 (0.88)	4.34 (0.83)	4.36 (0.48)	**4.08 (0.73)**	4.15 (0.54)
41-50 years old	**4.50 (0.63)**	4.15 (1.10)	**4.40 (0.61)**	4.04 (0.70)	**4.20 (0.55)**
51-60 years old	4.38 (1.12)	4.08 (1.04)	4.25 (0.88)	3.89 (0.97)	3.96 (0.83)
Over 60 years old	4.33 (0.57)	**4.67 (0.57)**	4.23 (0.40)	4.01 (0.70)	3.97 (0.54)
Male	4.33 (0.80)	4.12 (0.95)	4.32 (0.53)	4.02 (0.69)	4.05 (0.52)
Female	**4.43 (0.71)**	**4.49 (0.76)**	**4.35 (0.52)**	4.04 (0.70)	**4.18 (0.55)**

For all the variables related to SDT, PhD students presented higher levels than Master's students. Regarding age, the results were not conclusive for any of the strategies. On the other hand, in relation to sex, women presented themselves as more self determined, showing higher means and lower standard deviations. We emphasize that the dynamics adopted in Table 4 are one of the contributions of this study, because none of the referenced papers in the literature review segregated the most used individual strategies, nor did they examine these strategies' relationship with personal profile variables such as age and sex.

4.2 Multivariate data analysis

To identify and validate subjacent factors to self-determined learning strategies of accounting graduate students in Brazil, the research data were processed in two steps: (a) the identification of the factors using Exploratory Factor Analysis (EFA), performed in the *Statistical Package for Social Sciences* (SPSS); and (b) the dimensions identified in the previous step were submitted to validation procedures using SmartPLS software.

The EFA procedure, as shown in Table 5, with the assertions on the self-determined learning strategies, resulted in the extraction of six factors, with total explained variance of 55.73%. This procedure showed an adequacy index of KMO = 0.900 and a Bartlett's sphericity test of $\chi2 = 5869.12$, sig = 0.000, thus also showing an optimum level of adequacy of the EFA.

The first factor, with an explained variance of 25.13%, included statements related to the student's self-confidence in relation to their learning; the second factor, statements relating to the student's interest in the content, explained 11.27% of the variance; the third factor, statements related to stimuli and external motivations in relation to student's achievement, explained 6.92 % of the variance. The fourth factor, with an explained variance of 4.86%, included statements related to the respondent's anxiety during exams; the fifth factor, with explained variance of 3.94%, included statements related to student's internal stimuli and motivations in the face of new learning challenges; and finally, the sixth factor included statements linked to the perception of students in relation to learning self-control, with an explained variance of 3.61%.

Table 5

Resulting factors of self-determined learning strategies

	Components					
	Self confidence	Interest in Content	Extrinsic Stimulus	Anxiety about Exams	Intrinsic Stimulus	Learning Control
SDT 20. I'm confident I can do an excellent job on the assignments and tests in this course.	.765					
SDT 15. I'm confident I can understand the most complex material presented by the instructor in this course.	.759					
SDT 5. I believe I will receive an excellent grade in this class.	.701					
SDT 29. I'm certain I can master the skills being taught in this class.	.690					
SDT 6. I'm certain I can understand the most difficult material presented in the readings for this course.	.658					
SDT 2. If I study in appropriate ways. then I will be able to learn the material in this course.	.602					

	Components					
	Self confidence	Interest in Content	Extrinsic Stimulus	Anxiety about Exams	Intrinsic Stimulus	Learning Control
SDT 12. I'm confident I can learn the basic concepts taught in this course.	.523					
SDT 18. If I try hard enough. then I will understand the course material.	.489					
SDT 4. I think I will be able to use what I learn in this course in other courses.	.458					
SDT 10. It is important for me to learn the course material in this class.		.763				
SDT 22. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.		.760				
SDT 27. Understanding the subject matter of this course is very important to me.		.722				
SDT 23. I think the course material in this class is useful for me to learn.		.659				
SDT 17. I am very interested in the content area of this course.		.567				
SDT 21. I expect to do well in this class.		.500				
SDT 26. I like the subject matter of this course.		.471				
SDT 31. Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.		.413				
SDT 7. Getting a good grade in this class is the most satisfying thing for me right now.			.776			
SDT 11. The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.			.772			
SDT 13. If I can. I want to get better grades in this class than most of the other students.			.697			
SDT 30. I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.			.673			
SDT 3. When I take a test I think about how poorly I am doing compared with other students.			.476			
SDT 19. I have an uneasy, upset feeling when I take an exam.				.807		
SDT 28. I feel my heart beating fast when I take an exam.				.777		
SDT 14. When I take tests I think of the consequences of failing.				.595		
SDT 8. When I take a test I think about items on other parts of the test I can't answer.				.590		

	Components					
	Self confidence	Interest in Content	Extrinsic Stimulus	Anxiety about Exams	Intrinsic Stimulus	Learning Control
SDT 16. In a class like this. I prefer course material that arouses my curiosity, even if it is difficult to learn.					.730	
SDT1. In a class like this, I prefer course material that really challenges me so I can learn new things.					.716	
SDT 24. When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.					.431	
SDT 9. It is my own fault if I don't learn the material in this course.						.818
SDT 25. If I don't understand the course material, it is because I didn't try hard enough.						.807

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

In the second step of the data treatment, we proceeded to the construct validation through Confirmatory Factorial Analysis (CFA), using a partial least squares path modeling to structural equations modeling (PLS-SEM), with a *Path Weighting Scheme* algorithm, mean substitution of missing data (replacing all missing data in a variable by the mean of that variable) and normalization (mean = 0; variance = 1), starting with the dimensions obtained of SRL, as shown in Figure 5.
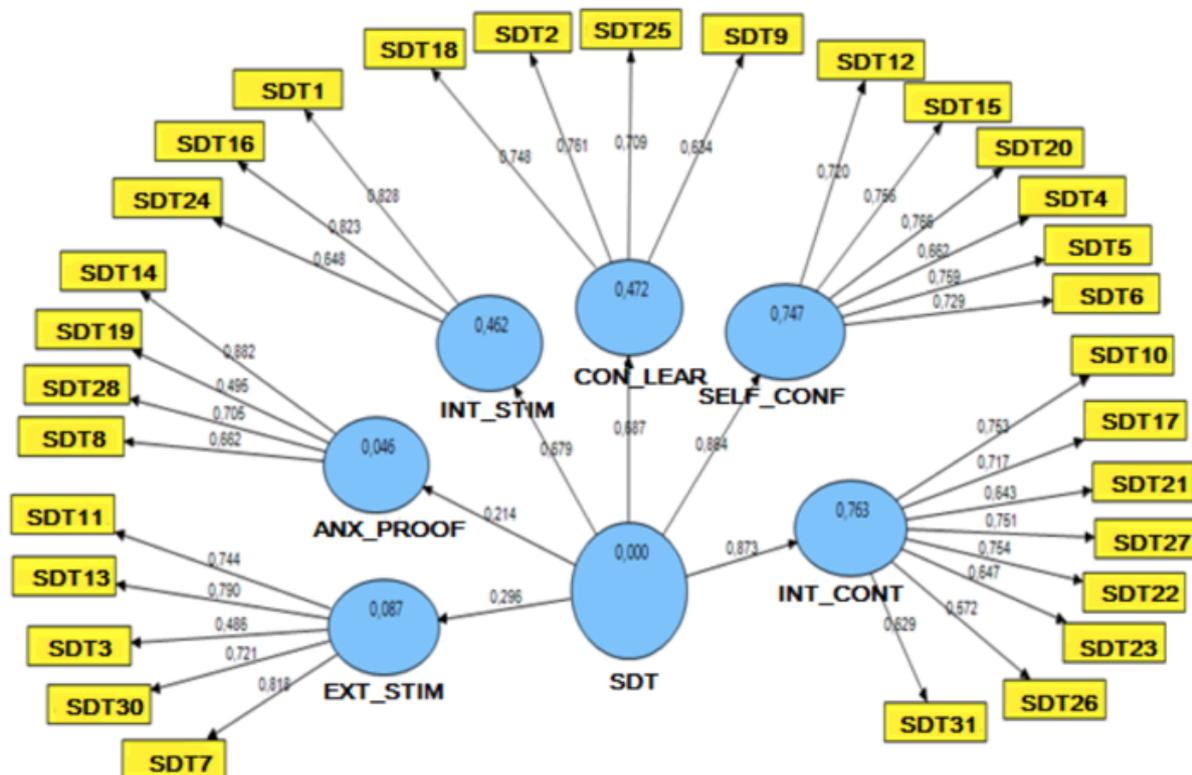

Figure 5. Processing the self-determined learning strategies

The SDT construct dimensions resulted from the PLS-SEM model, showing AVE and Compound Reliability (CR) scores above the levels recommended in the literature, as appointed by Chin (1998), Fornell and Larcker (1981) Hair, Black, Babin, Anderson and Tatham (2009), except the dimensions Anxiety (AVE = 0.4891; CR = 0.7863) and Content_Int (AVE = 0.4711; CR = 0.8759), which presented AVE marginally below the minimum level of 0.50, as shown in Table 6.

Table 6
Variance and compound reliability indicators

	AVE	Compound Reliability	R²	Cronbach's Alpha	Communality	Redundancy
Anx_Proof	0.489073	0.786338	0.045798	0.718388	0.489071	0.015356
Self-conf	0.536977	0.874087	0.747205	0.826788	0.536977	0.397921
Con_Lear	0.510649	0.805983	0.471945	0.689237	0.510648	0.231432
Ext_Stim	0.520274	0.840699	0.087446	0.772333	0.520274	0.041958
Int_Stim	0.594467	0.812947	0.461553	0.654401	0.594467	0.273410
Int_Cont	0.471089	0.875952	0.762936	0.837178	0.471089	0.357231

These results, however, when allied to the factor loads resulting from the PLS-SEM processing, reveal that the dimensions of the self-determined learning strategies construct meet convergent validity and were not excluded from the model.

Correlation loads between constructs and AVE roots of each construct, showed on the main diagonal of Table 7, were organized to evaluate discriminant validity of the dimensions of SDT learning.

Table 7
Correlation matrix of self-determined dimensions of learning

	Anx_Proof	Self-conf	Con_Lear	Ext_Stim	Int_Stim	Int_Cont
Anx_Proof	**0.699338**	–	–	–	–	–
Self-conf	0.018294	**0.732790**	–	–	–	–
Con_Lear	0.091974	0.549435	**0.714600**	–	–	–
Ext_Stim	0.408431	0.173617	0.154390	**0.721300**	–	–
Int_Stim	0.092246	0.485135	0.378031	0.045316	**0.771020**	–
Int_Cont	0.189846	0.624844	0.460469	0.148772	0.560036	**0.686360**

As shown in Table 7, the AVE root in each dimension exceeds the correlation between the dimensions of the construct, showing that the relationship between indicators and their respective dimensions are stronger than correlations between dimensions. Thus, the PLS-model possesses discriminant validity.

4.2.1 Analysis of the associations proposed in this study

After identifying and validating the dimension of the self-regulated and self-determined learning strategies adopted by graduate accounting students in Brazil, in this step, we aimed at testing the association proposed in this research.

In order to investigate the relationship between self-regulated learning strategies and self-determined learning strategies, we first analyzed the descriptive statistics of the scores obtained in the PLS-SME model for outlier detection, normality test and Pearson correlation.

The occurrence of six outliers was detected and, therefore, they were removed from the database,

leaving 510 valid cases. The normality test indicates that the scores of both learning strategies are distributed according to a normal distribution (KS = 1.260; sig = 0.084 and KS = 1.299; sig = 0.069), with a 5% level of significance.

Hypothesis H1 "Age as an influential factor in the level of SDT"
The proposed hypothesis (H1) sought to analyze if older graduate accounting students reported having higher SDT levels than younger students. For this purpose, the tested null hypothesis was the following:

$H1_0$: There is no influence of age in the SDT levels;
The influence of age in the SDT profile was tested with a simple linear regression model. As we can see in Table 8, the impact of differences in age was positive ($\beta a = 0.014$; sig = 0.751), but not significant at a 5% level of significance.

Table 8
Outcomes of the Simple Linear Regression

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlation			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	0.000	0.158		0.002	0.998					
Age	0.001	0.005	0.014	0.318	0.751	0.014	0.014	0.014	1.000	1.000

Thus, age does not significantly influence SDT learning scores, as the p-value was higher than the significance level. As so, the null hypothesis ($H1_0$) was not rejected.

Although previous studies (Castel, Murayama, Fridman & McGillivray, 2013, McDonough, 2006) do corroborate this hypothesis, in our research, we found no evidence of its verification. Our evidences might be influenced by the high level of segregation in the courses (professional master and academic master and PhD) of participants in different age ranges. That is, as there is a concentration of participant from different age groups in each of the three courses analyzed, the age dispersion was compromised, affecting the mean differences, which became non-significant. Besides the possibility of concentration of the respondents in certain age groups, another possible explanation considers that the SDT strategies can only develop until a specific age, that is, after this phase, it is less probable to stimulate those strategies. Based on the literature referenced (Ferreira, 2013; McDonough, 2006), we found evidence that older students displayed better levels of SDT in relation to younger students. We believe that the type of students in our study caused an exception, not being possible, because of this, to find significant differences between age groups and levels of SDT.

Although those findings do not support the hypothesis, they offered excellent evidence, as they indicate that, independently of age, graduate students do not differ in terms of learning strategies.

Hypothesis H2 "Sex as a determinant factor in the SDT levels"
The H2 hypothesis examines if there are significant differences between men and women in relation to SDT levels. The following null hypothesis was formulated for statistical analysis:

$H2_0$: There is no relation between sex and the SDT levels.
The influence of sex in the SDT (cf. Falcão and Rosa, 2008) profile was evaluated through an independent means hypothesis test and the outcomes presented in Table 9 indicate that self-determined learning strategies present variance homogeneity between the sexes (F = 0.2542; sig = 0.615).

Table 9
SDT Means by sex

		Levene's Test for Equality of Variance		t-test for Equality of Means				Std. Error Difference	95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference		Lower	Upper
SDT Strategies	Equal variance assumed	.254	.615	0.622	508	.534	.04934	.07929	-.10643	.20511
	Equal variance not assumed			0.621	495.58	0.535	0.04934	0.07942	-0.10669	0.20537

We also verify that the SDT learning strategies scores do not differ significantly between the sexes (t = 0.622; sig = 0.534) at a significance level of 5%. Hence, we do not refute hypothesis $H2_0$. As the literature review indicates, there is no convergence in the studies investigating the influence of the sex factor. These results indicate that the effect of sex needs still to be investigated more profoundly to gather conclusive results, also because we consider sex as a binary variable (masculine and feminine) here (and it was the case in the literature review) (Falcão and Rosa, 2008).

5. Final Considerations

This study identified the self-determined learning strategies used by respondents from a sample and the impact of age and sex in the motivational profile of accounting Master's and PhD students in Brazil.

To attain this goal, a data collection instrument was adopted with the scope of measuring the variables and the key-construct of this research: self-determined learning. The instrument applied (MSLQ) presented convergent and discriminant legitimacy based on a Structural Equations Model, which permitted the identification and validation of self-determined learning strategies in accounting graduate students. To answer the research problem and achieve the research goal, it was found that self-determined learning levels are not associated with sex and age.

The implications of the study promote adequate and up-to-date theoretical references for the empirical research the study proposed to address, involving age and sex in the context of self-motivation for learning, thus providing a relevant theoretical and academic advance on the theme. As practical implications, the empirical findings can help teachers, students, researchers, educational institutions and graduate programs understand the aspects of self-determined learning that characterize Master's and PhD students in Accounting.

We emphasize some limitations of our study, which can be perceived as possibilities for future research. Firstly, the sample considered a specific audience: Master's and PhD students from one area of knowledge. Future research engaged in the discussion proposed in this study may develop a horizontal comparative study, with students from different knowledge areas, or a vertical study, involving accounting students from undergraduate up to PhD programs. Secondly, a survey can present common method bias with possible discrepancies in the data. Other methodological strategies, such as for example a quasi-experiment, could be designed aiming to reexamine the associations investigated in our study.

Another relevant limitation was the relatively low participation of professional Master's students in the sample (36.7%). Future studies can select other strategies to attract those types of respondents or just include academic Master's and PhD students in the research design.

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