

## Self-Regulated Learning in Accounting: Diagnosis, Dimensions and Explanations

**Raimundo Nonato Lima Filho**<sup>†</sup>  
*Universidade do Estado da Bahia*

**Gerlando Augusto Sampaio Franco de Lima**<sup>Ω</sup>  
*Universidade de São Paulo*

**Adriano Leal Bruni**<sup>‡</sup>  
*Universidade Federal da Bahia*

### ABSTRACT

This research analyzes self-regulated learning in Accounting students in two public universities, presenting diagnosis, dimensions and possible explanations, contextualized from the gender, age and stage in the course. The objectives of this paper include to: (a) identify the self-regulated learning strategies used by Accounting students in two public universities, (b) determine the dimensions associated with those strategies, and (c) analyze how these strategies could be explained on the basis of gender, age or stage (semester) of the students in the course. A sample consisting of 249 individuals revealed that gender and age are factors that influence the degree of self-regulation of a student. Women and younger students tend to have higher levels of self-regulated learning, however, in the stage analysis, the results did not show normal distribution, thus demonstrating the impossibility of realizing the increase or decrease of the degree of self-regulated learning among respondents. These results contribute to the practice of teaching accounting, as older students and those with a male gender should receive more special attention in relation to their development of self-regulated, independent and proactive learning.

**Keywords:** Self-regulated learning. Students of accounting. Gender. Age. Stage in the course.

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#### \* Corresponding author:

<sup>†</sup> Doctor in Management by the Escola de Administração da Universidade Federal da Bahia.  
Type of contract: Professor in Universidade do Estado da Bahia.  
Address: Rodovia Lomanto Júnior, Campus Universitário, Senhor do Bonfim – BA - Brazil  
Email: rmlfilho@gmail.com  
Telephone: (74)3541-8900

<sup>Ω</sup> Accountig Professor in pela Universidade de São Paulo.  
Type of contract: Professor in Universidade de São Paulo.  
Address: Av. Prof. Luciano Gualberto, Cidade Universitária, São Paulo – SP - Brazil  
Email: gerlando@usp.br  
Telephone: (11) 30915820

<sup>‡</sup> Doctor in Management by the Faculdade de Economia, Administração e Contabilidade da Universidade de São Paulo  
Type of contract: Professor in Universidade Federal da Bahia.  
Address: Av. Reitor Miguel Calmon, S/N, Faculdade de Ciências Contábeis da UFBA, Salvador – BA - Brazil  
Email: albruni@ufba.br  
Telephone: (71) 3283-8772

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## 1 INTRODUCTION

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iven the current context in which the accounting profession finds itself, Accounting teaching has taken the challenge to keep up with changes in the profession and to contemplate education aimed at encouraging independent and self-regulated learning practices. The current situation of professional practice challenges the academic community with the expectation that students (future professionals) will be adaptable to change and market demands. In this context, attention focused on the learning of these students became the key issue to achieve these aspirations. In understanding Tuysuzoglu (2011), the purpose of education should not be only to accumulate knowledge, but above all, to raise the level of students' thinking skills.

The objectives of this paper include to: (a) identify the self-regulated learning strategies used by Accounting students in two public universities in Bahia (State in Brazilian Northeast), (b) determine the dimensions associated with such strategies, and (c) analyze how these strategies could be explained on the basis of gender, age or stage (semester) of the students in the course.

Educational research carried out in recent decades has advocated greater independence on the part of students in the teaching-learning process (LOMBAERTS *et al.*, 2008, GARNER, 2009; TUYSUZOGLU, 2011). Particularly, in accounting, the changes required in the process of the harmonization of Brazilian international standards have promoted discussions in the educational context. Accounting professionals must possess a critical stance and assume the role of apprentices throughout careers (SMITH, 2001). Faced with this demand, the accounting profession has demanded of the academic community, especially of educational research, prospects for the preparation of students for professional life, principally engaged in learning skills and continuing education (SCHLEIFER; DULL, 2009; MARTIN; DOWSON, 2009).

Recommendations of the Accounting Education Change Commission (AECC, 1990) and the American Institute of Certified Public Accountants (AICPA, 2000) point to the need for training in the classroom, leading students (of Accounting) to adopt attributes and permanent learning skills.

The contribution and the expected impacts of this study are to provide a review of current literature on the phenomenon of self-regulated learning, its suitability to the teaching of Accounting, and to diagnose learning manifested by accountancy students in two public

universities in Bahia (State in Brazilian Northeast). These results can be replicated in the future with students from other institutions, attest relations enabling learning in other contexts.

The findings of this study intend additionally to contribute to the teaching of accounting given the importance of analyzing the strategies of appropriation and transfer of knowledge to new learning. The literature on accounting education is relatively small despite the existence of international studies involving self-regulated learning (TUYSUZOGLU, 2011; BEZZINA, 2010; JONES *et al.*, 2010), and the proposed objectives for this study are singular in the context of academic production on the Teaching of Accounting in Brazil.

## **2 THEORETICAL**

People accumulate a significant amount of different types of knowledge throughout their lives. This diversity of information serves different purposes. To Schraw (2006), there are three main types of knowledge: declarative, procedural and self-regulated. Declarative knowledge corresponds to knowledge of facts and concepts, while procedural knowledge is knowledge of how to do things. This author described declarative and procedural knowledge as the building blocks for the development of cognitive skills, but the development of such skills need to be structured around the autoregulation of knowledge, without which even large amounts of declarative and procedural knowledge are unlikely to help people survive and adapt (ZEIDNER *et al.*, 2000; ZIMMERMAN, 2000; ARTINO JUNIOR; STEPHENS, 2009).

John H. Flavell, in the 1970s, from work on memory and learning has become one of the pioneering scholars of metacognition, defined as the knowledge that the subject has about his own knowledge or mental processes. From this research (FLAVELL, 1976), other studies have been developed defining metacognition as cognition cognition, ie where one commands one's own cognitive processes and products. However, with a more detailed examination of these definitions for the term metacognition, it is possible to find a common essence with regard to cognitive control populated by a set of internal mechanisms that promote, produce, record and consider information, as well as monitoring and self-regulating their own intellectual processing.

Based on the understanding that metacognition can promote intellectual self-regulation, a group of researchers led by Barry Zimmerman presented the perspective of self-regulated learning or Self-Regulated Learning (SRL). Educational researchers argue that there are significant differences between self-regulated learners and those who need external regulation

in their learning (ARIAS *et al.*, 1999; XU *et al.*, 2010; RICHTER; SCHMID, 2010). The self-regulated are decided, strategic, persistent and able to assess their progress, whereas the non-self-regulating do not have defined educational goals, thus having a greater dependence on cognitive (ZIMMERMAN, 2001).

Self-regulated learning is influenced by the constructivist paradigm that emphasizes the role of the student in the learning process (DRESEL; HAUGWITZ, 2008). In this perspective, SRL is defined from the socio-cognitive perspective, as how thoughts, feelings and attitudes generated by the individual, are designed and tailored to the needs of performing their own motivation and learning (ZIMMERMAN; KITSANTAS, 1997; MILLER; BYRNES, 2001; SCHUNK, 2005; BOEKAERTS; KAROLY; MAES, 2005; DINSMORE *et al.*, 2008). SLR is a process that establishes the active participation of the individual. It requires awareness of the goals to be achieved, recognizes the demands of the action to be achieved, discriminates and establishes the internal and external resources for the implementation of the action, assesses the level of achievement and amends procedures used if the result reached was not planned (DEMETRIOU, 2000; PAJARES, 2002).

According to Jones *et al.* (2010), the self-regulation of learning includes two key factors: the motivation to learn and controllability. Among the capabilities expected in self-regulated students are the ability to self-monitor and self-manage their learning process. To do so, they must exploit their knowledge about the strategies, and when to use a particular strategy, and have good organizational skills such as planning, monitoring and the evaluation of learning.

For self-regulated learning, a student must be able to accurately assess their own performance and use this evaluation to select a new learning task. In a recent survey conducted with 80 Dutch high school students, the authors concluded that SRL plays an important role in the learning of the individuals surveyed and that training of this skill can significantly increase their competence and their cognitive domain (KOSTONS *et al.*, 2012).

These discussions converge in some cognitive perspectives of SRL and share some general assumptions: the profile of the self-regulated learner is active and constructive, which therefore establishes goals for their learning, and watching this process, which seeks to regulate and control their cognition, motivation and behavior, guided and constrained by their goals and the contextual features in the environment (TUYSUZOGLU, 2011).

Identify and analyze the main processes, by means of which the subjects (students) can regulate their learning, thus autonomous, self-regulated learning, as active, independent and responsible, are key features for adequate adaptation to the demands of the constants changes in society (PATTERSON; LEE, 2010; GARNER, 2009). Tuysuzoglu (2011) reiterates that the student must be responsible for their learning process, which does not mean the possible elimination of the teacher in the management of learning activity. The student has to learn to learn, be "autoteaching", be able to prepare, facilitate and regulate learning, provide feedback and judgment of achievement, foster motivation and concentration.

Zimmerman and Martinez-Ponz (1986) showed fourteen possible self-regulated learning strategies, presented in Figure 1, with added examples by Rosário (1999). Its use gives the student a valuable tool, and is highly correlated with the indices of academic success and the teachers' opinion about their degree of self-regulation in the classroom.

- 1. Self-assessment:** statements indicating student evaluations of the quality or progress of their work (... checked my work to make sure it was okay);
- 2. Organization and transformation:** statements indicating initiatives to reorganize themselves, improving, learning materials (... always do a schema before performing the reports of chemistry experiments);
- 3. Goal setting and planning:** statements indicating the establishment of educational objectives: planning and completing activities related to those goals (start studying two weeks before the test and now I'm rested);
- 4 Looking for information:** Statements indicating the students' efforts to acquire extra information from non-social task when facing a school (before starting work, going to the school library to gather as much information on the subject);
- 5. Taking notes:** statements indicating efforts to record the results (in Physics classes take as many notes as possible on what the teacher says);
- 6. Environmental structure:** statements indicating efforts to select or change the physical or psychological environment to promote learning (to avoid distraction, I isolate myself in my room, to allow myself to focus on what I do, I turn off the music);
- 7. Self consequences:** statements indicating imagined rewards or punishments for school successes or failures (if the test goes well, I'll give myself a present);
- 8. Repetition and memorization:** statements indicating the initiatives and efforts of the students to memorize the material (in preparation for a Biology test, write the formula often, until I know it, color);
- 9. Help from teachers; 10. Help from peers; 11. Expert Help:** statements indicating the initiatives and efforts of students to seek help from teachers (9), peers (10) and specialists (11). "If you have difficulties in the study please ask my father who is a doctor ...".
- 12. Reviewing notes; 13. Revision tests and 14. Review of literature:** statements indicating efforts of the students to review notes (12), test themselves (13), and consult sources (14) in order to prepare for a lecture or a written exercise (I review before tests, always summarise what I have done to prepare for a test, solve the utterances of those who already did).

Figure 1 - Self-regulated learning strategies

Lombaerts *et al.* (2008) point out some advantages of autonomous learning: a) allows the student to learn and develop a greater understanding in the subject of interest, as the teacher, given the institutional and curricular demands on the time available, develops content considered essential, not allowing conditions to meet students' choices, b) contributes to the enrichment of students' knowledge c) breaks the student/teacher dependence, allowing the discovery of alternatives to the construction of knowledge; prepares students to exercise

citizenship and thus perform conscious choices in life, and d) prepares the student for the labor market, developing skills and competencies for the conscious exercise of the profession.

Transformations in society occur at a speed never seen before. We live in a time with fast developments in all fields of life. Accounting, as an applied social science, must accompany these processes of change, assimilating and adapting to new social settings. Companies now assume multiple roles and social responsibilities such as health and education in the communities in which they are located, along with their environmental responsibilities. With technological progress, which has encouraged the opening up of the international market, Brazilian accounting practices must now be harmonized with international standards. The accounting professional, face these challenges and changes at ever increasing speed, must adapt to meet demands in a timely fashion. He or she needs to master all of these scenarios, with a useful skill set and a willingness to cooperate with the preservation of the planet, for the prosperity and enhancement of corporate man. The accountant must be able to disseminate social responsibility within their organization and in companies providing services.

The accounting profession thus has challenged the academic community to prepare students for the profession requiring as the foundation, learning throughout life, enabling graduates to "learn to learn" and maintain the skills, knowledge and professional guidance necessary for success in the profession (SCHLEIFER; DULL, 2009).

For Becker (2011), the accountant must have, in addition to deep knowledge, a comprehensive and up-to-date knowledge of culture and the humanistic field of Behavioral Sciences. He or she must be a citizen with an open view of the world, able to adapt easily to changing scenarios and support continuing education as a condition of life.

The literature on SRL identifies and discusses the attributes of independent learners that help them continue to learn. Also, it offers information on the kinds of educational opportunities and support that can improve the self-regulation skills or abilities of the students, as they find themselves at university and helps them to become self-regulated (ZIMMERMAN; SCHUNK, 2001). Universities must strive at implementing a teaching model for students to "learn to learn", since only in this way will future professionals in Accounting possess the conditions for success in a society that is always in dynamic change (AICPA, 2000).

SRL, based in psychology and sociology in the study by Kumar (2005), presents a context where students define tasks, set goals, create plans, and use tools, tactics and

strategies for the implementation of its activities. The strategies for teaching self-regulation are a major key in promoting self-regulated learning (ZIMMERMAN, 1998). These strategies can be passed to students throughout the course, as being integrated auto-regulatory training (ZIMMERMAN *et al.*, 1996).

### 3 RESEARCH DESIGN

The positivist approach was used in the research, using the hypothetical-deductive method. It is characterized by seeking to corroborate a theory from observation of the relationship between these phenomena in the real world.

The research corresponded to 612 students enrolled in Accounting in the first half of 2012 at the Bahia State University (UNEB - Campus Senhor do Bonfim) and at the Feira de Santana State University (UEFS), two public universities, located in Bahia, Brazil. Data were collected from 249 students present in class at the beginning of the first semester of 2012.

**Table 1 - Stats with Descriptive Characteristics of the Study Sample**

<b>Gender</b>	<b>Female</b>	<b>Male</b>							<b>Total</b>
Frequency	146	103							249
Frequency %	58.63	41.37							100.00
<b>Age (years)</b>	<b>To 20</b>	<b>21-25</b>	<b>26-30</b>	<b>31-35</b>	<b>Above 36</b>				
Frequency	46	136	47	16	4				249
Frequency %	18.47	54.62	18.88	6.43	1.61				100.00
<b>HEI</b>	<b>UEFS</b>	<b>UNEB</b>							
Frequency	107	142							249
Frequency %	42.97	57.03							100.00
<b>Semester</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	
Frequency	78	41	20	44	20	35	9	2	249
Frequency %	31.33	16.47	8.03	17.67	8.03	14.06	3.61	0.80	100.00

Table 1 highlights that 58% of the sample were female, which reflects the current composition of the population analyzed. Currently, the Accounting Course at these institutions has a greater participation of women, a reversal of the trend in recent years, where the significant majority were male. Analyzing the age of the students surveyed, more than half are in the range of 21 to 25 years, while over 26% are more than 26 years-old. A portion of the sample (18.47%) are less than 20 years-old. The sample can be understood as a young man, a reliable reflection of what happens in classrooms of undergraduate public institutions. In relation to the institutions, 57% of the sample is from the Bahia State University, while the rest are from the Feira de Santana State University. Data were collected from students from the first to the ninth (and last) semester.

Three different procedures were used for quantitative analysis of the results, corresponding to each of the goals. The first goal, to identify the self-regulated learning strategies used by students in accounting in two public universities in Bahia, was achieved with the use of descriptive statistics. The second objective, evaluating the dimensions associated with learning strategies, was achieved with the use of factor analysis. The third objective, to analyze how the strategies could be explained on the basis of gender, age or stage (semester) of the student in the course, was achieved with the use of parametric tests for comparison of means (t tests). The assumptions that guided the scope of the third objective are presented in Figure 2.

Hypothesis of the study	Theoretical
H <sub>1</sub> : establishing that there are significant differences between men and women regarding the level of SRL	Hefer (2007)
H <sub>2</sub> : establishing that there is a significant correlation that the greater the age of a respondent the lower level of SRL	Mayville (2007)
H <sub>3</sub> : establishing that there is a significant relationship that the later the semester in the course of a respondent the greater the level of SRL	Lombaerts <i>et al.</i> (2008)

Figure 2 - Hypotheses associated third goal and theoretical

The hypotheses of this study are supported by current research that demonstrates the same goals. The first hypothesis, designated H<sub>1</sub>, is supported by Hefer (2007) who examined the hypothesis that the gender and ethnicity of a student can positively influence the attitude of self-regulated students of the Psychology course at a public university in the United States. The results revealed that the male students, who in the analyzed sample are a minority, have low self-confidence and self-regulation, significantly different compared to females.

The second hypothesis is supported by Mayville (2007), who investigated the influence of age in the context of the autocorrelation of students in Master's and Doctorates in Nursing in the age group 24-53 years. The results showed that students with a higher age showed greater difficulty completing the orientation program (online) that was applied as a research tool.

Finally, a study by Lombaerts *et al.* (2008) argues that education should be directed towards the development of a self-regulated profile in which students in advanced semesters must present higher levels of SRL compared to freshmen. What stresses the use of the third hypothesis of this study.

Affirmations	Self-regulated learning strategies
1. After completion of a job, always check to make sure it looks good.	1. Self-evaluation
2. I always try to devise a plan (scheme) before starting a job.	2. Organization and transformation
3. If you have a test, start studying as soon as possible, to be rested and relaxed on the day.	3. Goal setting and planning
4. Before starting a job, I use the library (and other search facilities either physical or digital) gathering as much information as possible on the topic.	4. Search for information
5. I always try to write down as many points as possible of a text read or the professor's comments during a lecture.	5. Taking notes
6. For better concentration, I always work in an environment that does not provide distraction.	6. Environmental structure
7. When I do a test, if goes well, I give myself a reward, and if the opposite occurs, I open up something they both wanted.	7. Self-consequences
8. I use strategies to memorize points (or formulas) or try to know by heart the subject being studied.	8. Repetition and memorization
9. When trouble arises and I cannot solve it alone, I seek outside help (teacher, peers, etc.).	9. Help teachers; 10. Help pairs near; 11. Help from experts
10. I evaluate my performance, I see that I must improve in order to prepare for a test.	12. Review notes; 13. Review of tests and 14. Review of the literature

Figure 3 - Affirmations and self-regulated learning strategies

The instrument for data collection was formed by two blocks. The first block consisted of four questions to gather data including the semester underway, gender, age and educational institution of the respondent. The second section sought to capture aspects of self-regulated learning, including ten statements relating to the use of the strategies proposed by Zimmerman & Martinez-Ponz (1986) and summarized in Figure 1. The assertions present in the second block can be seen in Figure 3, associated with the respective self-regulated learning strategies. For each statement, the respondent could give an answer between 1 (never) to 7 (always).

#### 4 RESULTS

The first objective was to identify the self-regulated learning strategies used by accounting students in two public universities in Bahia. The results are shown in Table 2. The sum of the relative frequencies does not reach 100% in the last five statements due to missing values on some issues. The last two columns present a summation of frequencies, responses to less than four and more than four (midpoint between the first and 7).

Table 2 - Self-Regulated Learning Strategies

Strategies	Answer							Total	Less than 4	Greater than 4	
	1 Never	2	3	4	5	6	7 Always				
E1	Fi	9	4	7	17	42	56	114	<b>249</b>	20	212
	Fi%	3.61	1.61	2.81	6.83	16.87	22.49	45.78	<b>100</b>	8.03	85.14
E2	Fi	11	19	19	37	52	49	62	<b>249</b>	49	163
	Fi%	4.42	7.63	7.63	14.86	20.88	19.68	24.9	<b>100</b>	19.68	65.46
E3	Fi	22	37	34	48	57	23	28	<b>249</b>	93	108
	Fi%	8.84	14.86	13.65	19.28	22.89	9.24	11.24	<b>100</b>	37.35	43.37
E4	Fi	9	9	18	31	43	48	91	<b>249</b>	36	182
	Fi%	3.61	3.61	7.23	12.45	17.27	19.28	36.55	<b>100</b>	14.45	73.1
E5	Fi	9	17	17	23	50	61	70	<b>247</b>	43	181
	Fi%	3.61	6.83	6.83	9.24	20.08	24.5	28.11	<b>99.2</b>	17.27	72.69
E6	Fi	5	6	9	26	35	61	106	<b>248</b>	20	202
	Fi%	2.01	2.41	3.61	10.44	14.06	24.5	42.57	<b>99.6</b>	8.03	81.13
E7	Fi	115	23	27	30	26	19	8	<b>248</b>	165	53
	Fi%	46.18	9.24	10.84	12.05	10.44	7.63	3.21	<b>99.6</b>	66.26	21.28
E8	Fi	23	22	34	41	56	35	36	<b>247</b>	79	127
	Fi%	9.24	8.84	13.65	16.47	22.49	14.06	14.46	<b>99.2</b>	31.73	51.01
E9	Fi	2	11	8	23	32	63	109	<b>248</b>	21	204
	Fi%	0.8	4.42	3.21	9.24	12.85	25.3	43.78	<b>99.6</b>	8.43	81.93
E10	Fi	2	7	12	32	52	67	76	<b>248</b>	21	195
	Fi%	0.8	2.81	4.82	12.85	20.88	26.91	30.52	<b>99.6</b>	8.43	78.31

The midpoint of the scale shown in the instrument for data collection corresponded to the number four, and in this research means that learning strategies are above this point. In the strategies analyzed, it is emphasized that the self-consequences strategy (E7) is less used. Only 21% of respondents indicated more than 4 points. The remaining sum frequency responses represented greater than 50% for higher responses than four. The three self-regulated learning strategies would be employed in E1 (self-assessment), E6 (environmental structure) and E9 (seeking outside help).

The second goal, which verifies the dimensions with the strategies was achieved with the use of factor analysis. According to Burkhardt *et al.* (2012), factor analysis is a statistical method whose purpose is to distinguish a set of measurable variables directly, called observed variables, such as the visible manifestation of a smaller set of hypothetical and latent variables, called common factors and a number of unique factors, each acting on only one of the observed variables. The use of this technique provides two main functions: to summarize and reduce data (HAIR JUNIOR *et al.*, 1998). Another property of the analysis is its ability to determine the degree of influence of a particular variable in the elucidation of a factor (later found), and to evaluate the intensity of relations between the observed variables.

Factor analysis of the results indicated the existence of two factors, according to Table 3.

**Table 3 - Principal components analysis**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings.		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.574	35.738	35.738	3.574	35.738	35.738
2	1.163	11.630	47.369	1.163	11.630	47.369
3	.947	9.471	56.840			
4	.758	7.575	64.416			
5	.718	7.181	71.597			
6	.697	6.969	78.566			
7	.602	6.021	84.587			
8	.552	5.520	90.107			
9	.519	5.187	95.294			
10	.471	4.706	100.000			

According to Cattell (1966) and Shimada *et al.* (2010), the number of factors must be determined by following three criteria retaining an analysis. The first criterion applied to determine the number of factors retained in the analysis was the Kaiser Test. The proposal is to consider only eigenvalues greater than 1.0. The eigenvalue analysis indicated the presence of only one eigenvalue greater than the first two components, suggesting the existence of two different dimensions. The second criterion used was the proportion of the variance. The eigenvalue above 1 is only one criterion for setting a factor, it is necessary to note the contribution of these factors in the variance of the initial eigenvalue. It can be seen that the factor 2 (1.163) despite having eigenvalue greater than 1, does not contribute as significantly as factor 1 (3.574). The third criterion used for determining the number of factors was screen-analysis plot, shown in Figure 4, which shows an inflection point between the eigenvalues above the break point falling curve of the function after the factor 2.

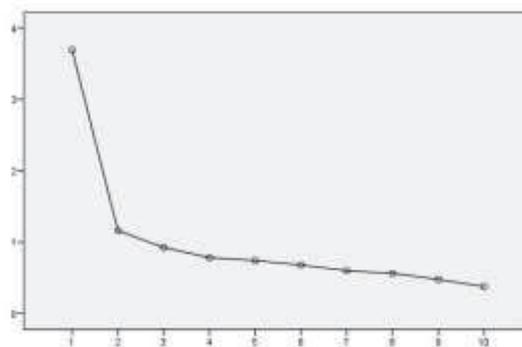


Figure 4 - Scree-plot

Based on the criteria established by the method suggested by Cattell (1966) and Shimada *et al.* (2010), the principal components analysis indicated the existence of two distinct factors. We used the promax oblique rotation method for the analysis of correlation coefficients, as we expected theoretically that the items are correlated. The promax rotation provides, besides the factorial matrix, two matrices: a matrix pattern and structure matrix,

which outline oblique standards or clusters of intercorrelations among the variables. The factor loadings thus determine the patterns and the degree of involvement of each variable with the standards. While the pattern matrix shows which variables are highly involved in terms of factor loadings in each cluster, the structure matrix shows the extent of the correlation of the variables with the standards as a whole.

**Table 4 - Analysis of the Correlation Coefficients with the Method *Patern Matrix***

Dimension	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10
1	<b>0.646</b>	<b>0.657</b>	<b>0.703</b>	<b>0.642</b>	<b>0.624</b>	<b>0.623</b>	0.37	<b>0.504</b>	0.473	<b>0.653</b>
2	-0.274	0.05	0.103	-0.046	0.372	-0.116	<b>0.692</b>	0.191	<b>-0.608</b>	-0.189

Source: Authors' (2012)

According to Cattell (1966), determining the factor only comes to an end when it is examined the affinity of the items with the factors of the model. The construct's factorial design is purged according to the following criteria: (a) when the absolute value of the load factor main item is smaller than 0.32, (b) when factor loadings are similar in two or more factors in the same item (the difference between the absolute values of factor loadings of the items is smaller than 0.10), and (c) is formed by a factor of two or more items. From these criteria, as illustrated in Table 4, item E9 (external aid) was deleted since it showed less than 0.32 load factor. The item E7 (self-consequences) was also excluded due to the third criterion for determining: a factor cannot be formed by one item. The only dimension obtained from the analysis aggregated the items 1 (self-assessment), 2 (transformation and organization), 3 (goal setting and planning), 4 (request for information), 5 (taking notes), 6 (environmental structure), 8 (repetition and memorization) and 10 (performance improvement). The size was entitled "self-regulated learning", and has been validated according to the procedures presented in Netemeyer *et al.* (2003) and summarized in Table 5. After the checks on dimensionality, reliability and convergence, the scale was represented by averaging the responses collected for these items.

**Table 5 - Steps Associated with the Validation of the Scale "Self-Regulated Learning"**

Steps and statistical techniques	Rules for validation	Self-Regulated Learning
<b>Dimensionality</b>		
Principal components	Only one eigenvalue must exist on the scale.	Only one scale eigenvalue (eigenvalue equals 3.284, explaining 41.053% of the variance).
KMO	Greater than 0,7: Desirable. Less than 0,5: Unacceptable.	KMO equal to 0,866, desirable.
Bartlett's test.	Low level of significance..	Chi-squared equals 410.958, significance level equal to 0.000.
<b>Reability</b>		
Cronbach's alpha	Cronbach's alpha > 0,60.	Cronbach's alpha = 0,789.
<b>Convergence</b>		
Pearson's Coefficient	Pearson's Coefficient > 0.	All Pearson's coefficients were positive and significant.

The factor analysis "self-regulated learning " discloses the possibility of constructing a scale representing a single dimension. The test value of KMO was considered desirable (0.866) and the Cronbach's alpha (0.789). It was also possible to see the low level of significance desirable for Bartlett's test of sphericity. The size was represented by the average items. The descriptive statistics are presented in Table 6. Realizing an average (5.144) above the midpoint, indicates that, in general, respondents used self-regulated learning strategies with relatively strong intensity. The dispersion of the data, represented by means of standard deviation (1.04284) was considered relatively low, indicating a relatively homogeneous sample.

**Table 6 - Descriptive Statistics of Scale "Self-Regulated Learning"**

	N	Minimum	Maximum	Average	Standard Deviation
Self-Regulated Learning	249	1,00	7,00	5,1440	1,04284

The third objective is to analyze the strategies could be explained on the basis of gender, age or stage (semester) in the course was achieved by using a t test for independent samples, considering the degree of self-regulated learning as an independent variable. For the realization, each test sample was segregated into two groups according to gender (male and female), age (24 years and above 24 years) and the stage in progress (until the fifth semester and from the sixth semester). The results can be seen in Table 7.

**Table 7 - Results of Tests of Equal Average**

	N	Average	Standard Deviation	Standard error of mean	Levene's test		T test		
					F	Sig.	t	Degrees of freedom	Sig. (bi)
Age									
>= 24 anos	107	4.9059	1.10437	.10676	2.251	.135	-3.185	247	.002
< 24 anos	142	5.3234	.95940	.08051			-3.123	209.827	.002
Gender									
Female	146	5.4276	.84131	.06963	8.333	.004	5.390	247	.000
Male	103	4.7420	1.16605	.11489			5.103	174.154	.000
Stage in the course									
To 5th Semester	139	5.105601	0.978679	0.083	3.029	0.083	0.652	247	0.515
From the 6th Semester	110	5.192532	1.121358	0.1069			0.642	217.572	0.521

In this analysis, we adopted the t test (which is used to base the analysis on a type of data distribution similar to normal distribution, known as "t-distribution") and Levene's test (which is used to test if k has the sample's same variance, a t-test is the absolute value of the distance that each observation is the average). The significant results of these tests indicate that the null hypothesis should be rejected, and once again, that the differences are confirmed.

Table 7 highlights the lack of significant differences in self-regulated learning relationships and ongoing semester students analyzed, indicating that it is not possible to see an increase or decrease of the degree of self-regulated learning among respondents at the start or end of the course (above Sig. 5%). This result shows that independent attitudes and self-regulated learning are not promoted in the institutions examined, since the new students, graduates and current students do not have significant differences in their level of self-regulated learning. This result frustrates expectations. Lombaerts *et al.* (2008) argue that the evolution of teaching practices should encourage self-regulated learning. This analysis highlights the importance of teaching geared to greater independence of students not only in the institutions analyzed, but in all Higher Education Institutions (HEIs) that offer the course in Accounting in the analyzed region, as results in other public or private HEIs can be similar to the two public universities analyzed.

By contrast, the test results showed the existence of significant differences in self-regulated learning in the student's ages. The average of students below 24 years of age (5.3234) is greater than the average students above 24 years of age (4.9059), this relationship has a significance level of 0.2%, which confirms the second hypothesis of this research and studies corroborating Mayville (2007).

Likewise, the analysis employed highlighted the existence of significant differences in self-regulated learning and gender ratio of the students analyzed, indicating that it is possible to realize a higher degree of self-regulated learning among female respondents (Sig. to 0%). The average of the students surveyed was well above (5.4276) of average students (4.7420), which acknowledges that this research confirms its first case, corroborating thus the evidence from studies of Hefer (2007).

## **5 CONCLUSION**

From the analysis of the survey instrument, drawn from the basic conceptual framework of self-regulated learning by Zimmerman & Martinez-Ponz (1986), applied to 249 students in Accounting Sciences from two public universities in Bahia, we attempted to identify (a) self-regulated learning strategies used by students, (b) the dimensions associated with such strategies, and (c) how these strategies could be explained on the basis of gender, age or stage (semester) of the student in the course .

These results contribute to the practice of teaching accounting, since students with higher age and male gender should receive more special attention in relation to their development of self-regulated, independent and proactive learning. It is worth noting that empirical evidence does not exempt younger students and/or females from developing SRL, quite the contrary, a praxis teacher should stimulate a standalone profile in all students involved. What this research shows is that in the sample selected, students and older males are more likely to have a less self-regulated learning profile.

Another result of this study shows that levels of self-regulation of students analyzed over the semesters do not differ significantly, which is alarming for the reality of teaching accounting, as the literature argues that graduating students should have a higher average in relation to students in the course, and in relation to freshmen. Attention is drawn here to the limitation that the diagnosis was not applied to the same group of students over the years (longitudinal study), but to different groups at different times of course.

Some important limitations of the study deserve attention. Firstly, as discussed in the exposure of methodological procedures, the sample used involved only two universities in the interior of Bahia. New research could seek to involve colleges or universities in other contexts (other regions, private institutions) in order to test whether different results would be found, other factors such as the citizenship and societal transformation may be considered in future research. The results of this research, with innovative features, an embryo can be considered

for future research in Brazilian academic area. Studies on teaching accounting are, in general, incipient, with little discussion in the national context.

Therefore, the importance of a self-regulated learning discussion is evident. Its development has the capacity to improve teaching practices in higher education, going beyond the teaching of accounting.

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