

## JUDGEMENT CAPACITY & DECISION-MAKING EVALUATION BASED ON INTERNATIONAL ACCOUNTING STANDARDS

### IEDA MARGARETE ORO

*Doctor of Accounting Sciences and Business Management by FURB.  
Professor for the Professional Master Business Administration of  
UNOESC. Address: Rua Nereu Ramos, 3777D | 89713-000 |  
Chapecó/SC | Brasil.*

**Email:** [ieda.oro@unoesc.edu.br](mailto:ieda.oro@unoesc.edu.br)

### ROBERTO CARLOS KLANN

*Doctor of Accounting Sciences and Business Management by FURB.  
Professor for the Post-Graduation Program in Accounting Sciences of  
FURB. Address: Rua Antonio da Veiga, 140, Victor Konder | 89012-  
900 | Blumenau/SC | Brasil.*

**Email:** [rklann@furb.br](mailto:rklann@furb.br)

### ABSTRACT

The current international standards emphasize the need for judgment and decision making of accounting professionals on issues involving the recognition and measurement of financial facts. This study aims to evaluate the judgment and decision making of accountancy academic professionals in resolving issues involving international standards. Depending on the characteristics of the study we sought, throughout the development of the analysis, the association with the classic heuristic decision-making, such as representativeness, availability, anchoring and adjustment. The research is characterized as an exploratory study, a survey with a quantitative approach. The sample consisted of 97 undergraduate Accounting students from a University of Santa Catarina. The questionnaire selected 6 issues involving judgment and decision-making and integrates evidence from the Federal Accounting Council. In the heuristics analysis, which involves judgment and decision-making, an increasing use of heuristics of availability and anchoring and adjustment was found in the questions under analysis. The average percentage of correct answers in the six questions was considered low; however, it does not invalidate the results, but it draws attention to the degree of bounded rationality in decision-making. Thus, it must be emphasized that the cognitive biases may be caused by the use of heuristics. The survey findings reveal relevant points that reinforce the importance of judgment and decision-making as an accountant skill in the academic training.

**Keywords:** Judgment. Decision Making. Heuristics. International Accounting Standards.

### 1 INTRODUCTION

The current international standards have increased the degree of judgment and decision-making on the accounting facts involving the process of recognition, measurement and disclosure of accounting information, and, in this case, Ludícibus, Martins, Gelbcke and Santos (2010) warn that it requires the exercise of judgment by the accountant. For Dantas and Macedo (2013, p. 1), the “new way of doing accounting in Brazil raises concern about the

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preparation of accounting professionals to deal with this change and the cognitive elements that are present in the decision-making process for such professionals."

Accounting using accounting standardization has constantly evolved and "has been proved to be easily influenced, and influenced indeed, by culture, economics, legal thinking, power, interests, etc." (Martins et al., 2007, P.2). The shift from rule-based accounting to principle-based accounting has increased the judgment required by those responsible for preparing the financial statements (Ernest Young & Fipecafi, 2010).

Judgment and decision-making studies rely on prescribing successful ways to make reliable decisions in game situations (Hastie, 2001). Like many of the cognitive functions, decision-making brings an internal difficulty to researchers in the behavioral area: it is a phenomenon that can only be known by the behavior in decision situations and by inferences made based on these behaviors (César, Akamine Jr. & Perez, 2011).

The two main reasons for the research in the behavioral sciences are the development of scientific theories and the resolution of problems occurring in everyday life. The behavioral research has been historically divided into two distinct streams: judgment and decision-making (Hastie, 2001).

The year of 2010 has been considered a divisor of accounting in Brazil, due to the full adoption by the companies of the IFRS standard, which is considered more complex than the old standards, requiring more judgment and decision-making by the Accountant. Laws 11,638/2007 and 11,941/09 and the international accounting standards issued by IASB and implemented in Brazil by CPC and regulatory bodies, such as the CVM and the CFC, among others, provides the use of principles rather than rules, furnishing higher judgment and analysis, and, therefore, higher quality and usability of the financial statements (Lemes & Carvalho, 2010; Ludícibus et al., 2010).

In this sense, the rational behavior becomes very important and causes individuals to treat information objectively without any tendencies, propensities or aversions. The decisions involve the psychological processes that constantly show that people make them in a little rational way (Pinto, 2012).

In this context, the question arising from this research is: What is the judgment and decision-making capacity of accounting sciences students in solving issues involving international standards? Judgment studies generally focus on how people interpret and decide in situations of multiple, conflicting suggestions about different situations. On the other hand, decision-making involves choosing between several options (Hastie, 2001; Eysenck & Keane, 2007).

The purpose of this research is to evaluate the judgment and decision-making capacity of accounting sciences students in solving international standards issues. To achieve the general objective, two specific objectives were outlined: a) verify if students attending the subject of international accounting notions present a better performance in solving issues involving judgment and decision-making; b) investigate whether students more experienced in accounting have a better performance in solving issues involving judgment and decision-making. Given the characteristics of the study, we sought, through the development of the analysis, the association with classical decision-making heuristics: representativeness, availability, anchoring and adjustment

International accounting standards are present in many curricular components within the professional and theoretical-practical core of the bachelor of accounting sciences, due to the need to update the contents of the Accountant's education. However, the suggestion for inclusion of a discipline addressing the international accounting standards took place through the national curricular guidelines in CNE / CES Opinion no. 10/2004, in Art. 5. These suggested the relevance of including contents that covered "knowledge of the economic and financial, whether national and international, scenario, in order to provide harmonization of international accounting standards and rulings."

Despite of the fact it is not mandatory to offer the subject of International Accounting, as per Resolution issued in 2004, several Accounting sciences courses in Brazil included it in the curricular matrix. Niyama, Botelho, Correa & Santana (2008, p.114) point out that of the 888 Brazilian institutions observed, "286 (32.20%) are in the capitals of Brazilian states and, of these, 183 (20.61%) published their curriculum on Internet. However, in only 44 (24.04%)

curricula was found the subject of International Accounting or similar". However, it has been found that there is a symmetry in the number of International Accounting or similar disciplines in the Brazilian regions.

This study brings as contribution a behavioral approach related to international accounting standards and behavioral aspects involving judgment and decision-making with accounting sciences students. The empirical application of research related to the evaluation of the decision-making capacity is useful in the sense of aligning theory with professional practice.

## 2 JUDGEMENT AND DECISION-MAKING IN ACCOUNTING

Judgment and decision-making are present in many accounting situations. They involve the need to estimate, measure, recognize and establish criteria, such as depreciation, economic shelf life, recoverable value, among others. The success in the judgment of accounting facts regarding the process of measurement and recognition of information by accounting professionals depends on the level of knowledge about the subject, or on reliable bases for estimating or defining clear and objective criteria.

The relationship between accounting and behavioral theories has been discussed in international literature for about 50 years (Birnberg, Luft & Shield, 2007). Accounting research focused on economic change and market mechanisms is among the types mostly researched in the behavioral area (Birnberg, 2011). In the 1970s, the researches in the accounting area started using cognitive psychology theory to study how individuals subjectively use accounting information to make decisions (Kahneman & Tversky, 1979; Birnberg et al., 2007).

The basis of behavioral literature indicates that there are differences between judgment and decision-making. The decision-making, according to Eysenck and Keane (2007: 460), "involves problem-solving as individuals try to make the best choice from a range of options." While judgment is evaluated by the level of accuracy and can have indirect consequence through decisions made (Havey 2001 as quoted in Eysenck & Keane, 2007). In this sense, decision-making refers to the whole process of choosing a course of action (Hastie, 2001).

In the case of research on judgment and decision-making, there are three theoretical frameworks that provide the motivation for current and future research, according to Hastie (2001): (a) the traditional theory of expected utility, most prominently represented by Von Neumann and Morgenstern (1947), and the prospect theory by Kahneman and Tversky (1972), which focuses on choice and behavior on the decision-making process; (b) algebraic cognitive theories that addresses judgment and estimation; and (c) computational cognitive theories that address mind perception, inferential and mnemonic functions.

Decisions in general have a higher or lower level of complexity. According to Kaufmann (1981, p.14), "one of the least obvious factors that makes decision in human actions difficult is the complexity of the modern world." That is, "living among this complexity we are more or less conditioned to it, but our constraints begin when circumstances generate decisions whose consequences we consider important."

The decision is the "process that leads directly or indirectly to the choice of, at least, one of several alternatives, all of which are candidates to solve a certain problem" (Gomes, 2007, p.1). In the decision-making process, people are looking for simplified features that are better known as heuristics. The most frequent heuristics are: representativeness, availability & anchoring and adjustment. Matlin (2003) argues that heuristics are strategies that generally produce a right solution. Often, the human being fails to distinguish the limitations of these heuristics and sometimes fails to make the most reasonable decision. It employs previous experiences or even beliefs, to make decisions.

People also use heuristics to cope with limited rationality, simplifying the decision-making process (Dorow, Macedo Júnior, Nunes, Reina & Maximiniano, 2010). The representative heuristic, according to Kahneman and Tversky (1979) is often used when judging a sample as representative, if this is similar to the population for which it was selected. Marin (2009) point out that the heuristic of representativeness occurs when during the performance of a judgment an individual or an event there is a tendency to look for characteristics that correspond to representations previously experienced.

Regarding the availability heuristics, Sternberg (2010) stresses that most of us employ,

at least eventually, through judgments made based on the level of ease with which we can bring to memory those things we perceive as relevant situations of a phenomenon. For Marin (2009), this type of heuristic may have a very useful decision-making management strategy, since higher frequency events are usually also the mostly remembered ones.

The "heuristic of anchoring and adjustment relates to the availability by which people adjust their assessments through certain reference points called anchors of purpose" (Sternberg, 2010, p.440). Matlin (2003) points out that this heuristic usually leads to a reasonable answer, however, it often depends on the availability heuristics, once information available serves as an anchor. According to this theory, the decision makers start from a point until the adjustments in the final decision. The values serve as anchors and can be historical data, in the way the problem is exposed or random information, thus generating greater difficulty for the decision-making success (Bazerman, 2004).

For Robbins (2004, p. 128) the "individual makes decisions aimed to obtain the best results, this process is carried out in a rational way, because the objective is the maximization of values". While Bazerman (2004, pp. 3-5) points out that judgment is part of the "cognitive aspects of the decision-making process." The author suggests that for a rational model of decision-making, it is required to: 1) clearly delimit the problem; 2) have defined criteria; 3) accurately weigh all the criteria; 4) know the relevant alternatives; 5) accurately assess each alternative based on the defined criteria; 6) evaluate the alternatives and choose the ones with the highest perceived value.

The adherence to international accounting standards is not only an operational process, since some cultural concepts shall be modified. It is known that in Brazil, before the change to international standards, the standards were mostly based on the doctrine of Roman law (code law), that is, in rules, unlike IFRS, whose main characteristic is to be based on principles. Considering the nature of a principle-based accounting system, where general precepts that serve as a benchmark for professional judgment are established, the best way to evidence the economic essence of operations, the model is more appropriate where there is a customary legal tradition (Direito Comum) (Dantas, Niyama, Rodrigues & Mendes, 2010).

When the standardization is rule-oriented, there are rules for everything: if this happens, do that, if alternative a takes place, ask question b, if it is positive, do this, etc." (Martins Et al., 2007, p.10). And it is likely that the solutions are found from the meticulous reading of the rules. It is not necessary to create, the judgment is reduced to classifications that fits the accounting fact (Martins et al., 2007).

In the current rules, the information on judgment indicates that the entity should disclose, in the summary of significant accounting practices or explanatory notes, the judgments that involve estimates used in the process of applying the accounting practices and that have a more significant effect on the amounts recorded in the financial statements. The Basic Conceptual Pronouncement of the Accounting Pronouncements Committee (Pronunciamento Conceitual Básico do Comitê de Pronunciamentos Contábeis - CPC (CPC 00, item 86, p.24)) states that "in many cases, the cost or value must be estimated, the use of reasonable estimates is an essential part of the preparation of financial statements, and does not affect its reliability".

Studies involving the academic accounting sciences education and dealing with the judgment and decision-making capacity are considered rare in the scientific literature (Maia, 2012). The proofs of sufficiency test and technical qualification by the Federal Counsel of Accounting are structured in knowledge and calculation, judgment and memorization. However, in the first exam of sufficiency of 2012 and in the second of 2011, only 4 questions were considered to be related to judgment and, therefore, integrated the list of questions of the test (Maia, 2012). Given the current accounting standards, this subject should be part of new studies. Subsequently, some behavioral studies carried out in Brazil focused on accounting decision-making processes.

## **2.2 Behavioral studies in accounting decision-making processes**

Humans are endowed with skills and intelligence that allow them to decide between several options. Some decisions do not have established rules, while others require the need

for judgment of the facts. Behavioral research involving decision-making is the target of several studies in Brazil.

Lima (2007) observed the behavior of users of accounting information in the form of presentation and demonstration of accounting reports and their influence on the decisions made by their users. The study was carried out through experiments with students from public and private institutions. The results confirmed the formulation effect in five of the six situations presented.

Cardoso and Oyadomari (2010) investigated the existence of functional attachment in the accounting information environment. In the Brazilian accounting environment, with the change in the accounting regulation, we estimate that information users may have a hard time with this type of effect, once past experience may impact their decision. The research was based on two experiments based on accounting situations, changed by Law 11638/07. A sample of 120 questionnaires applied between market professionals and students with or without experience was used. The results of the research confirmed the existence of functional attachment, as well as the non-influence of the professional experience in the decision process when comparing the professionals that work in the market and the students.

Macedo and Sources (2009) analyzed the impact of limited rationality in the decision-making process, under an accounting-financial analysis environment. To this end, a questionnaire was applied to 91 analysts, who were invited to make a decision or to express an opinion on the aspects addressed in each of the questions. The results show that, in general, the use of judgment heuristics, as well as of prospect theory, lead to biases, which deviate the choice of a purely rational alternative.

Silva and Gonçalves (2011) verified whether the pro-forma statement influences the user of the accounting information in the decision process. The data were collected through two types of questionnaires applied to a total of 355 Accounting sciences students. In the first type, only the financial statements based on the Fundamental Principles were informed; in the second type, the Proforma Statement was also informed. The results showed that the immobilization of equity has an impact on the results. But that, in general, the pro-forma statement does not significantly change the decision-making process by the user of the accounting information.

The decision-making process in the accounting environment, based on the Prospects Theory, demonstrates that decisions are based mainly on judgment, contributing to the awareness of the imperfections of judgments and decisions (Pinto, 2012). The survey was applied to accounting professionals. In the results, it was found that the questions involving certainty in the field of gains are the mostly searched among the respondents. It is possible to identify the presence of the Framing Effect. Regarding gender, we identify a greater impact of the Framing Effect in men than in women.

The Judgment and Decision-making (J&DM) capacity is also subject of studies in the area of education. Maia (2012) studied how J&DM has been taught in the Accounting sciences undergraduate courses, when the training of skills and abilities of professionals starts. Despite the approach of the subject by some IESs, the teaching of J&TD, given its relevance in the application of international accounting standards, is still not satisfactory. Xavier Filho, Dias, França, Silva and Vasconcelos (2015) analyzed the importance given to the accounting area by students of the Administration course. The research addressed the analysis of the relevance attributed through Judgment Influencers (IJ). They represent socioeconomic characteristics that may impact the judgment. However, even considering those influencers, no statistical difference was observed after the students had attended the subject. Another study, conducted by Moreira, Firmino, Santos, Silva and Silva (2015), investigated the uniformity of the quality in services performed by Brazilian auditing firms on Brazilian public companies, based on the adoption of CVM Deliberation 564/08. The results showed a lack of uniformity of the quality in independent auditors' report based on the adoption of the adjustment to present value.

### 3 RESEARCH METHOD

This section presents the research design and sample, as well as the contents of the questionnaire applied to the students hereunder, besides a brief context of the International

Accounting discipline in Brazil.

### 3.1 research design and sample

This research is characterized as exploratory survey with a quantitative approach. Creswell (2007, p.161) defines survey research as "a quantitative or numerical description of a population's trends, attitudes or opinions by studying a sample thereof." The quantitative approach was used to identify the percentages of right and wrong answers of the two groups of students determined by the study. The relationship of the answers to the heuristics represents general strategies that usually produce a correct solution.

The research population comprised 170 Accounting sciences undergraduate students who composed 4 different groups, one on each campus of the University. The sample is characterized as non-probabilistic and intentional, since it takes place in restricted universe, given that the participants were selected at the convenience of the researchers, which resulted in 102 academics. Of which, 5 were excluded because their questionnaires presented inconsistencies (failed to answer some of the questions, or provided more than one answer to the same question). Participants were divided into two groups. The first one corresponding to 50 students who attended the subject of international accounting notions in August and September, 2012, with questionnaire application on September 27 and 28, 2012. While the second group, of 47 students, attended the discipline in October and November, 2012, with questionnaire application on October 01 and 02, 2012. The data collection document was applied by the course coordinators on the dates mentioned.

The participant students are in the fourth year and have already had, during the course, in other accounting-related subjects, contents involving the international standards. At the moment of the research, 85% of the contents of the specific accounting core have already been studied. The choice of the subject is justified by the purpose of this research.

### 3.2 Contents of the survey questionnaire

The research instrument initially required answers to 3 closed questions for purposes of profiling (gender, age group and experience in the accounting area). Subsequently, in order to meet the goal, it requested the resolution and response to 6 questions identified as judgment in the study of Maia (2012) that, therefore, requires decision-making. All questions are included in the Federal Accounting Council's Sufficiency Examination and Technical Qualification tests. In Table 1, the content, foundation, regulation and origin of the questions (Technical Qualification Test - TEQ and Sufficiency Examination - ES).

Table1  
**Questions involving judgment**

No. of the question	Content	Foundations (IAS e CPC)	Regulation (CFC)	Source of the question
01	Consolidated Statements - determining when to consolidate	IAS 27; CPC 36 (R1) (2009)	1.240/09 alt.; .273/10 e 1.351/11- NBC TG 36	EQT, 2010
02	Revenue recognition	IAS 18 CPC30 (2009)	1.187/09; NBC TG 30	EQT, 2010
03	Non-current assets held for sale and discontinued operations	IFRS 5 CPC 31 (2009)	1.188/09; NBC TG 31	EQT, 2010
04	Construction contracts - measurement	IAS 11 CPC 17 (2009)	1.171/09; NBC TG 17	EQT, 2010
05	IFRS for PMEs business combination – identification of the purchaser	IFRS for SMES CPC PME (R1)	1.255/09; 1.285/10 1.319/10;1329/11 NBC TG 1000	EQT, 2011
06	Public grant – recognition	IAS 20 CPC 07 (R1) (2010)	1.305/10 NBC TG 07	ES, 2012

**Note.** Source: own preparation based on Maia, K. I. C. (2012). *The teaching of judgment and decision-making in under-graduating accounting sciences in Brazil*. Masters dissertation. Brazilian School of Public Administration and Business - EBAPE - FGV. São Paulo, Brazil. Recovered on July 29, 2012, from

<http://bibliotecadigital.fgv.br/dspace/handle/10438/9909> and the Federal Accounting Council (2012). Technical Qualification Test and Sufficiency Examination. Recovered on August 10, 2012, from [http://www.portalcfc.org.br/coordenadorias/desenvolvimento\\_profissional/exames/exame\\_de\\_qualificacao\\_tecnica/](http://www.portalcfc.org.br/coordenadorias/desenvolvimento_profissional/exames/exame_de_qualificacao_tecnica/)

### 3.3 International Accounting Discipline

The discipline of International Accounting was inserted in the curricular matrix based on the suggestion of 'CNE / CES 10 Opinion of 2004 and integrated in the curricular matrix of the IES accounting course, which conducted this study in 2009, based on the need to offer content related to Harmonization of international accounting standards and regulations. The course is offered with 30 classroom hour in the eighth term of the course.

The amendment of the discipline in the pedagogical project provides the supply of contents related to the form of recognition and measurement that involves the international standards of accounting. However, it is worth noting that in this research we did not observe if the program contents indicated in the teaching agenda of professors teaching the mentioned subjects were related to the specific items of Table 1.

## 4 DESCRIPTION AND ANALYSIS OF RESULTS

In order to respond to the research problem, a questionnaire was applied to two groups of students, following the results of the study. First, the profile of the respondents.

### 4.1 Profile of respondent students

Regarding the gender and age range of students covered by the analysis, Table 2 presents the results.

Table 2  
Gender and time of experience in accounting

Gender	Experience up to 1 year	%	Experience more than 1 year	%	No experience	%	Total	%
Female	13	68	35	76	25	78	73	75
Male	6	32	11	24	7	22	24	25
Total	19	100	46	100	32	100	97	100

**Note.** Source: research data.

It was found that the research sample is represented by 75% of female respondents and 25% of male respondents. With regards to the experience in the accounting area, 19 answered they had less than a year. From which, the majority are female. At the experience time, more than a year, 76% are also female. There is also a significant percentage of inexperienced academics, 32 students do not work in the accounting area, and attend the senior year. Table 3 shows the relationship between the age group and the time of experience of the participating students

Table 3  
Relation between the age and experience time of student

Age group	Up to 1 year experience	%	More than 1 year experience	%	No experience	%	Total	%
Up to 20 years	3	16	2	4	4	13	9	9
From 21 to 25 years	15	79	31	67	21	66	67	69
From 26 to 30 years	0	0	9	20	5	16	14	14
Over 31 years	1	5	4	9	2	6	7	7
Total	19	100	46	100	32	100	97	100

**Note.** Source: research data.

Most students participating in the research are between 21 and 25 years old, corresponding to 69% of the sample. Of these, 67% indicated that they had more than one-year experience in the accounting area. The age groups that presented less observations in the sample were up to 20 years old and over 31 years old.

#### 4.2 Analysis of research results

This section presents the results of the research, comparing the indexes of correct answers to the questions between the two groups. A group that had already attended (50 students) and another that had not attended (47 students) the subject of notions of international accounting. Matlin (2003, p.261) points out that "in decision-making, the judgment and the choice between different alternatives are at stake." That is, when faced with situations of uncertainty, deductive reasoning is used to seek the solution.

##### a) Consolidated Statements

Table 4 presents the first question with the answers alternatives, and Table 5 shows the percentages of correct and wrong answers. The wording of the question is structured based on CPC 36 (R1) (2009), which addresses the consolidated financial statements. The answer is letter D.

Table 4

##### First Question

Question	Answer Alternatives
In May 2009, the publicly traded company Brasília SA acquired a minority interest of 48% of the voting capital (32% of the share capital) of Luisiânia S.A. In September 2009, by virtue of a shareholders agreement execution, for the first time, in the invested company, Brasília SA took control over the management of Luisiânia S.A. On December 31, 2009, Brasília S.A. shall prepare consolidated financial statements. With respect to the subsidiary's income statement, what period shall be consolidated?	a) May to December, 2009. b) only from 2010. c) January to December, 2009. d) September to December, 2009.

**Note.** Source: Federal Accounting Council (2012). Technical Qualification Test and Sufficiency Examination. Recovered on August 10, 2012, from [http://www.portalcfc.org.br/coordenadorias/desenvolvimento\\_profissional/exames/exame\\_de\\_qualificacao\\_tecnica/](http://www.portalcfc.org.br/coordenadorias/desenvolvimento_profissional/exames/exame_de_qualificacao_tecnica/)

Note that a greater percentage of answers occurred in wrong alternatives, 70% in Group 1 and 51% in Group 2, according to table 5.

Table 5

##### Amount of correct and wrong answers in the first question

Groups	Correct	%	Wrong	%	Total		%
Group 1	15	30	35	70	50		100
Group 2	23	49	24	51	47		100

**Note.** Source: research data.

In this question, group 2, who did not study the subject of international accounting, obtained a higher number of successful answers, with 49%, and, therefore, the smallest amount of choice of wrong alternatives. The judgment occurred on the period of consolidation of the subsidiary's income statement. In the analysis of the data, most respondents were undecided between the answer of letter A (May to December, 2009) and letter D (September to December, 2009). In this case, a matter of judgment is perceived, where students interpreted and decided in situations of multiple suggestions with a high level of complexity related to the period of time of the object of consolidation. The anchorage and adjustment heuristic explains the errors when estimates are made on time intervals, given the degree of uncertainty of the question.

##### b) Revenue recognition

The second question addressed CPC 30 (2009), which addresses the Revenue Recognition. The revenue from the sale of assets shall be recognized when the following

conditions are met: a) the entity has transferred to the buyer the most-significant risks and benefits inherent to the ownership of assets; b) the entity does not maintain continuous involvement in the management of assets sold to a degree that would be normally associated to the ownership or effective control of such assets; c) the revenue value can be reliably measured; d) the economic benefits associated with the transaction are likely to flow to the entity; e) expenses incurred or to be incurred related to the transaction can be reliably measured (RES CFC 1187/09). Table 6 shows question 2 and Table 7 presents the students' answers thereto. The correct answer is the letter D.

Table 6

**Second question**

Question	Answer alternatives
2. The company Joinville SA, based in São Paulo, sold a machine for wood lamination for R\$ 50,000.00 to the company Blumenau Ltda., headquartered in Mato Grosso do Sul. Billing took place on 5/2/2009; The issue of the machine occurred on 6/2/2009; and the delivery thereof occurred on 10/2/2009. The sales agreement provides that the company Joinville S.A. undertakes to install the machine in the company Blumenau Ltda., which requires two days of work. Finally, after a 30-day inspection and testing period, if everything happens according to the contract, the buyer shall issue a machine acceptance agreement, simultaneously releasing the payment of the obligation resulting from the purchase. According to NBC T 19.30 - Revenue, approved by CFC Resolution No. 1,187 / 09, the RIGHT opportunity for revenue recognition is:	a) at the time of issuance of the invoice, since at that moment the right to receive from the customer and the relevant clearance on inventories are recognized in the books. b) at the moment of issue of the goods, because at that moment the taxable event related to the Tax on the Circulation of Goods and Services (ICMS) takes place. c) at the moment of delivery of the goods to the customer, because at this moment the customer declares that he received the goods by signing on the Invoice stub. d) when the buyer accepts delivery, and the installation and inspection are completed.

**Note.** Source: Federal Accounting Council (2012). Technical Qualification Test and Sufficiency Examination. Recovered on August 10, 2012, from [http://www.portalcfc.org.br/coordenadorias/desenvolvimento\\_profissional/exames/exame\\_de\\_qualificacao\\_tecnica/](http://www.portalcfc.org.br/coordenadorias/desenvolvimento_profissional/exames/exame_de_qualificacao_tecnica/)

The percentage of wrong answers in both groups was high, exceeding 70%. Group 1 had a higher rate of correct answers, with 24%, while group 2 had 19%, according to Table 7.

Table 7

**Amount of correct and wrong answers in the second question**

Groups	Correct	%	Wrong	%	Total	%
Group 1	12	24	38	76	50	100
Group 2	9	19	37	79	47	100

**Note.** Source: research data.

By analyzing the data, we observe that the highest amount of answers to this question were the answer of letter A (at the time of issuance of the invoice, since at that moment the right to receive from the customer and the relevant clearance on inventories are recognized in the books), indicating the general rule of revenue recognition. However, the correct answer is letter D (when the buyer accepts the delivery, and the installation and inspection are completed). Note that the judgment associated the heuristic of availability and anchoring and adjustment, namely, the degree of ease to bring to me memory what is perceived as relevant occurrences of a fact. The alternative provided in letter A addresses the normal procedure of sales of stocks, which is usually associated as an anchor in the reasoning of the question.

## c) Non-current assets held for sale and discontinued operations

The next question refers to the non-current assets held for sale and discontinued operation - discontinued CPC 31 (2009). This standard aims to establish the accounting of non-current assets available for sale and the presentation and disclosure of discontinued operations. The criteria for classification of assets held for sale: a) measured by the lowest between the book value then recorded and the fair value less sales costs, and that the depreciation or amortization of these assets are ceased; b) separately presented in the balance

sheet and that the results of discontinued operations are separately presented in the income statement. Table 8 presents question 3 and the answer alternatives. Table 9 presents the students' responses thereto. The correct answer is the letter C.

Table 8  
Third Question

Question	Answer Alternatives
One entity is reorganizing its activities into 3 industrial units due to a significant reduction in the demand for the products they produce. Units "X" and "Y" shall have their activities terminated until the end of the current year. Only one machine, in unit "Z", that corresponds to a production line shall be temporarily deactivated, being maintained and preserved to be reactivated when there is an increase in the demand for the products. In accordance with NBC T 19.28 - Non-current Assets Held for Sale and Discontinued Operations, choose the option that presents the CORRECT treatment considering the year-end discontinued operations.	<p>a) Only the machine in Unit "Z" shall be considered discontinued operation.</p> <p>b) Units "X" and "Y" and the machine of unit "Z" shall be considered discontinued operations.</p> <p>c) Units "X" and "Y" shall be considered discontinued operations.</p> <p>d) Units "X" and "Y" shall not be considered discontinued operations. Since they shall be terminated only; and the machine of unit "Z" shall not be considered discontinued, since it can be reactivated when demand increases</p>

**Note.** Source: Federal Accounting Council (2012). Technical Qualification Test and Sufficiency Examination. Recovered on August 10, 2012, from [http://www.portalcfc.org.br/coordenadorias/desenvolvimento\\_profissional/exames/exame\\_de\\_qualificacao\\_tecnica/](http://www.portalcfc.org.br/coordenadorias/desenvolvimento_profissional/exames/exame_de_qualificacao_tecnica/)

In the third question, we notice a significant difference between the two Groups. Group 1 had a low percentage of correct answers, with only 12%, while Group 2 reached 43% of correct answers, according to Table 9.

Table 9  
Amount of correct and wrong answers in the third question

Groups	Correct	%	Wrong	%	Total	%
Group 1	6	12	44	88	50	100
Group 2	20	43	27	57	47	100

**Note.** Source: research data.

By analyzing the answers, the judgment of the two Groups fell on the answer of letter D (Units "X" and "Y" shall not be considered discontinued operations. Since they shall be terminated only; and the machine of unit "Z" shall not be considered discontinued, since it can be reactivated when demand increases). The correct answer corresponds to the alternative of letter C (Units "X" and "Y" shall be considered discontinued operations).

The judgment on this question consisted of whether unit "Z" should be considered discontinued at the year-end. I.e., most respondents had no doubt that units X and Y were considered discontinued. We noticed the association of the heuristic anchorage and adjustment relating the availability by which people adjust their assessments by means of certain reference points called purpose anchors. Matlin (2003) points out that this theory can serve as an anchor, that decision-makers start from a initial point to the adjustments in final decision. However, there is a cognitive bias, mainly in Group 1, which shows a perceptual misrepresentation culminating in an imprecise judgment in solving the issue.

#### d) Measurement of construction contracts

Question 4 observed the CPC 17 (2009) addressing the measurement of Construction Contracts, which recommends that the contract revenue should include: (a) the initial amount of revenue in the contract and (b) variations in the contracted labor, claims and incentive payments. The judgment involves an environment of uncertainty and assessment of the contractual revenue estimate. Table 10 shows the question and answer alternatives. Table 11 shows the results. The correct answer is the letter A.

Table 10  
Fourth question

Question	Answer Alternatives
NBCT 19.21 – Construction Contracts states that contract revenue is measured by the fair value of the consideration received or receivable. The measurement of contract revenue can be affected by uncertainties that depend on the outcome of future events. Estimates often need to be revised, as events occur and uncertainties are resolved. Therefore, the amount of contractual revenue may increase or decrease from one period to the other. Choose the option that shows the CORRECT example of this type of event.	<p>a) Contracting party and contracted party may agree upon variations or claims that increase or decrease the contract revenue in a period subsequent to that in which the agreement was initially agreed upon.</p> <p>b) The amount of expenditure estimated in fixed price contracts may increase as a result of cost increase clauses.</p> <p>c) The amount of contract revenue may decrease as a result of penalties arising from delays attributable to third parties.</p> <p>d) When the fixed price contract is related to the completion of each unit, the contract revenue remains fixed proportionally to the units completed.</p>

**Note.** Source: Federal Accounting Council (2012). Technical Qualification Test and Sufficiency Examination. Recovered on August 10, 2012, from [http://www.portalcfc.org.br/coordenadorias/desenvolvimento\\_profissional/exames/exame\\_de\\_qualificacao\\_tecnica/](http://www.portalcfc.org.br/coordenadorias/desenvolvimento_profissional/exames/exame_de_qualificacao_tecnica/)

In question 4, there is greater alignment in the responses of the two Groups. The question indicates that the measurement of contract revenue can be affected by uncertainties that depend on the outcome of future events, as shown in Table 11.

Table 11  
Amount of correct and wrong answers in the third question

Groups	Correct	%	Wrong	%	Total	%
Group 1	19	38	31	62	50	100
Group 2	18	38	29	62	47	100

**Note.** Source: research data.

The wording of the question indicates the time factor as a conflict and evaluation point. By analyzing the answers, we found that the doubt in the students' thinking was between alternative A (Contracting party and contracted party may agree upon variations or claims that increase or decrease the contract revenue in a period subsequent to that in which the agreement was initially agreed upon) and letter D (when the fixed price contract is related to the completion of each unit, the contract revenue remains fixed proportionally to the units completed).

The association of the proportional recognition of the contract revenue with alternative D may indicate a relation to the information familiarity and availability. Matlin (2003) points out that if the problem requires so you remember examples. In this case, it was framed in situations that represent the heuristics of availability.

e) Business combination - identification of the purchaser - IFRS for PMEs

Question 5 questioned the IFRS for PMEs - Business combination - identification of the purchaser. According to NBC TG 1000, a purchaser shall be identified in all business combinations. The purchaser is the combined entity that takes control of other entities. Table 12 shows the question and Table 13 the answers. The correct answer is the letter D.

Table 12  
Fifth Question

Question	Answer Alternatives
According to NBC TG 1000 - Accounting for Small and Midsize enterprises (PMEs), a purchaser shall be identified in all business combinations. Although sometimes the identification of the purchaser may be difficult, there are usually indications of its existence. Choose the option that	<p>a) If the fair value of one of the combined entities is significantly greater than the fair value of the other combined entity, the entity with the highest fair value is likely to be the purchaser.</p> <p>b) If the business combination is effected through exchange of ordinary equity securities with voting rights in cash or other assets, the entity that is rendering cash or other assets is probably the purchaser.</p> <p>c) If the business combination results in the management of one of the combined entities, being able to control the selection of the management board of the resulting combined entity, the entity whose management is able to control is probably the purchaser.</p>

does NOT indicate the existence of a buyer.	d) If the equity value of one of the combined entities is significantly higher than the equity value of the other combined entity, the entity with the highest equity value is likely to be the purchaser.
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**Note.** Source: Federal Accounting Council (2012). Technical Qualification Test and Sufficiency Examination. Recovered on August 10, 2012, from [http://www.portalcfc.org.br/coordenadorias/desenvolvimento\\_profissional/exames/exame\\_de\\_qualificacao\\_tecnica/](http://www.portalcfc.org.br/coordenadorias/desenvolvimento_profissional/exames/exame_de_qualificacao_tecnica/)

In the fifth question, the disagreement between Groups was bigger, as well as between the answer alternatives. Group 1 had the lowest percentage of correct answers, with 18%, while Group 2 had a better rate, with 36%. Most of the wrong answers occurred in the alternatives of letters B and C, while the correct answer was letter D, as shown in Table 13.

Table 13

**Amount of correct and wrong answers in the third question**

Groups	Correct	%	Wrong	%	Total	%
Group 1	9	18	41	82	50	100
Group 2	17	36	30	64	47	100

**Note.** Source: research data.

The analysis presented in the wording of the question highlights the need for judgment in the alternatives proposed by mentioning the non-indication of a purchaser. Noted that the other three alternatives (A, B and C) are part of NBC TG 1000 (item 19.10). It is assumed that most respondents were unaware of the ways that the acquirer is identified as determined by the specific standard. When the heuristics of availability is contaminated by factors such as unawareness of contents, it leads to incorrect decisions in solving an event.

## f) Revenue from Public Grant

The last question covered the CPC 07 (2010), which addresses the recognition of revenue originated from Public Grant. Item 12 addresses the accounting: "A public grant shall be recognized as revenue over the period against the expenses intended to compensation, on a systematic basis, provided that the conditions for the Pronouncement are met. The public grant can not be credited directly to the equity." Table 14 shows the question and answers. Table 15 shows the answers. The correct answer is the letter C.

Table 14

**Sixth Question**

Question	Answer Alternatives
A business company received a public grant aimed to offset costs with hiring, training and maintaining a minimum number of employees during the first three years of operation. The grant was received through deposit in a freely available current account upon the signature of protocol with the state government. According to NBC TG 07 – Public Grant and Assistance, the amount received by the company shall be:	<p>a) immediately recognized in the Equity, under Tax Incentive Reserve account.</p> <p>b) immediately recognized in the income for the period and, once the result has been recorded, registered under Tax Incentive Reserve account.</p> <p>c) recorded in the liabilities and recognized as income during the period and against the expenses intended to compensation, on a systematic basis.</p> <p>d) recorded in equity and recognized as income at the end of the period in which the expenses intended to compensation shall occur, and on a systematic basis.</p>

**Note.** Source: Federal Accounting Council (2012). Technical Qualification Test and Sufficiency Examination. Recovered on August 10, 2012, from [http://www.portalcfc.org.br/coordenadorias/desenvolvimento\\_profissional/exames/exame\\_de\\_qualificacao\\_tecnica/](http://www.portalcfc.org.br/coordenadorias/desenvolvimento_profissional/exames/exame_de_qualificacao_tecnica/)

By analyzing the answers of question 6 there was no consensus among the respondents in Group 1, i.e., we found that all alternatives were proportionally chosen, while in Group 2, the mostly chosen alternative was the option of the letter A (immediately recognized in the Equity, under Tax Incentive Reserve account), according to Table 15.

Table 15

**Amount of correct and wrong answers in the third question**

Groups	Correct	%	Wrong	%	Total	%
Group 1	13	26	37	74	50	100
Group 2	14	30	33	70	47	100

**Note.** Source: research data.

The correct answer to question 6 is letter C (recorded in the liabilities and recognized as income during the period and against the expenses intended to compensation, on a systematic basis). The public grant measurement basis occurs upon the receipt of the amounts deposited in the company's current account. In this case, the judgment relies in the recognition of the entity's balance sheet and income statement. The form of recognition and registration of the public grant was the main point of judgment of the question.

The table below provides the total of correct answers to questions 1 to 6 related to the time of experience of participants.

Table 16

**Comparative table of students with and without experience in accounting**

Question	Content	Total Correct Answers	%	Less than 1 year experience	%	More than 1 year experience	%	SEC	%
1	Consolidated Statements	38	39	5	27	22	48	11	34
2	Revenue Recognition	21	22	3	16	13	28	5	16
3	Discontinued Operations	26	27	5	26	14	30	7	22
4	Measurement of Construction Contracts	37	38	7	37	17	37	13	41
5	Identification of the purchaser - IFRS for PMEs	28	29	6	32	15	33	7	22
6	Recognition of Public Grant	27	28	2	11	19	41	6	19
	Average	30	30	5	25	17	36	8	26

**Note.** SEC – No accounting Experience.

Source: research data.

Table 9 shows an average of 30% of correct answers to the six questions by the two Groups. The question with the highest percentage of correct answers was question 1, with 39%, and question 4, with 38%, which address the consolidation of the financial statements and the measurement of construction contracts, respectively. In the first question, the object of judgment consisted of the recognition period and, in question four, the measurement of contract revenue that occurs in an uncertainty environment. The second question presented the lowest percentage of correct answers for the two Groups. It addresses the revenue recognition period, which corresponds to 22% (CPC 30, 2009).

Comparing the students with and without experience in accounting (SEC), we observe that students with more than 1 year experience in accounting had an average percentage of 36%, while those with no accounting experience (SEC) had an average of 26%, which represents a difference of 10%. The comparison between students with more than 1-year experience and students with less than 1-year experience is similar to the previous result, namely, 11% higher. The results provide evidence that the experience in the accounting area is a relevant factor for decision-making. Cardoso and Oyadomari (2010, p. 1) emphasize that the intention "is not to prove that this fact decisively determine that the professional experience affect the decision of the individual, but to demonstrate that this type of analysis can be carried out in depth in future Studies in the area of behavioral accounting".

## 5 CONCLUSION

This article aimed to evaluate the judgment and decision-making capacity of accounting sciences students in solving questions related to international accounting standards. The study conducted a survey research, classifying students into two Groups: Group 1, who attended the course, and Group 2, who had not attended the course of Notions of International Accounting. Six questions requiring the judgment of students were selected from the Federal Accounting Council (2010, 2011 and 2012). According to the characteristics of the study, we sought the association with classical decision-making heuristics: representativeness, availability, anchoring and adjustment.

The study outlined two specific objectives. The first was to assess whether the students attending the course of international accounting perform better in questions involving judgment and decision-making on international standards. We found that the performance of the students was not better after attending said subject. Group 1, who had attended the course, performed better than Group 2, which had not attended the course, only in two out of the six questions proposed. The Course of International Accounting Notions has a workload of only 30 classroom hours, which may be a limitation to the results found hereunder.

With regards to the second objective, i.e., to investigate whether students with more than 1-year experience in the accounting area perform better in questions involving judgment and decision-making, we found that students with more than 1-year experience obtained indeed a higher percentage of correct answers, if compared to those with less than 1-year or no experience in accounting (SEC), in line with the results verified by Cardoso and Oyadomari (2010).

In matters involving judgment and decision-making, it is common to use deductive reasoning to solve questions presenting ambiguous answers or lack of information (Matlin, 2003). By analyzing the heuristics that involve judgment and decision-making, we found a greater use of the heuristics of availability and anchoring and adjustment in the analyzed questions. In a general overview, the average percentage of correct answers in the six questions was considered relatively low, corresponding to 30%. However, it does not invalidate the results, instead, it draws attention to the limited degree of rationality in decision-making. Moreover, worth mentioning that cognitive bias can be triggered by the use of heuristics, which was also observed by Macedo and Sources (2009).

From a general analysis (combining the correct answers of both groups), we found that question 1, which addresses the consolidation of financial statements, and question 4, regarding the measurement of construction contracts, had a better performance ( $\geq 38\%$ ), while question 2, which addresses the revenue recognition, had the worst performance, of 22%. The remaining questions 3, 5 and 6, addressing the discontinued operation, the identification of the IFRS acquirer for SMEs and the recognition of public grant revenue, respectively, had an average performance of 28%.

The information hereof cannot be generalized, since this is a research predominantly quantitative applied only to one IES, but, like other researches of similar nature, its findings demonstrate relevant points that reinforce the judgment and decision-making capacity as ability of the Accountant. Other limitations relate to the application of the research to students who did not attend the course of international accounting. The contents covered in the questions may not have been object of study in the course of international accounting or other curricular components. We understand that more studies are necessary for further deepening the topic. The investigation of students from other higher education institutions is recommended, to make it possible the comparison of the results. We understand that there may be different results if research is conducted with students from other regions and institutions.

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