ΣΟΦΙΑ–SOPHIA

Models of school scientific knowledge in a group of university teachers of Public Accounting

Marlon David García Jiménez

Ms. Science teaching of Universidad Autonoma de Manizales, Certified Public Accountant of Universidad del Quindio. Research professor of the Faculty of Economic, Administrative and Accounting Sciences of Universidad La Gran Colombia-Armenia, member of the research group in accounting management, finances and taxation - GECOFIT. Armenia-Colombia garciajimmarlon@miugca.edu.co

* Article result of the homonymous research project, presented by the author to obtain the title of Mastery in Teaching of the sciences in Universidad Autonoma de Manizales, under the direction of Ph.D. Javier Alonso Zambrano Hernandez and Ms. Liliana Mejia Botero.

UNIVERSIDAD La Gran Colombia Seccional Armenia

Sophia-Education, volume 12 number 1. English version

Abstract

This document presents a discussion on the object of study of didactics of sciences and its relationship to new dimensions of accounting, from which teacher notions are determined, on teaching accounting as an academic discipline, in university programs of public accounting. The methodological design is presented, which includes a critical and mixed approach research, and which is composed by three stages: the first one is quantitative, through Likert surveys, applied to a sample of teachers; the second one is qualitative, in which a sample of teachers is questioned through interviews; and the third one develops a saturation of data mediated by Grounded Theory. It is finally concluded that teachers show a separation between epistemological and sociological notions of accounting and teaching, establishing that teachers' thought shows diverse elements in scientific nature, contrary to a speech on teaching which reveals a primacy of disciplinary empirical content.

Keywords: Didactics in accounting, teaching-learning, sciences teaching, cognitive model of school science.

Introduction

Educational research on accounting presents postures and contributions around accounting training; it is enough to approach with analytical sense states of art as the content in Apostolou et al. (2013), or in the publications of Loaiza Robles (2009, 2011) for the Colombian case. Starting from these readings and contrasting this content with the statement by the research in the field of the teaching of the sciences, a process of critical reflection begins around the contents to be taught of accounting as a university program, the thought of the professorate, and the student-teacher-accounting relations.

This research allows us to insist that the current knowledge of accounting and the level of formality that has been achieved show the imprint of a different direction for accounting education, which focuses on the formation of concepts and scientific-disciplinary knowledge and not only on the practical instruction for the labor field, a situation described by Cortés (2006), whom from the edge of critical reflection in accounting argues a polarization in the training of accountants, insisting that they either develop a practical expertise without theoretical ground or get transformed into scholars who are broadly aware of theories that don't have practical application of their knowledge.

This situation shows a novel approach to the teaching of accounting, in which it transcends practical training for the preparation of business books towards a scientific-social view of accounting training, which is inserted in an interdisciplinary and epistemological discussion, and whose objectives rest more on the search of critical thinking of specific domain than in the instruction for the world of a firm.

The teaching of sciences appears, in front of this surge, as a discipline from which to observe accounting education within the framework of the social sciences; it is with this maxim that this article presents research results oriented to constitute diagnoses on the current moment of the accounting-didactics relationship, and how both are cohesive around the conceptual disciplinary evolution of accounting knowledge.

Accounting education has been directed from the pedagogical discourse, whose evolution is considered significant from the recognition of accounting as an academic discipline in the university order, aspect linked to the initiation of the process of strengthening public accounting as a profession in Western countries.

Such discourse has significant implications in the curricular aspects of the different public accounting programs, a situation presented by the implications of accounting information in micro and macroeconomic aspects, which has led to different notions, theories and pedagogical models being inserted in accounting training, in many cases without deep reflection about its relevance.

The Colombian case, which contextualizes the research from which results are presented, does not depart from this description; indeed, it is recognized an important construction of thought about pedagogy and accounting education, as stated by Loaiza Robles (2009, page 158) "it is intended that the accounting pedagogical discourse is structured from the dialogue of knowledge and that this transdisciplinary interaction is traversed by life as a value and as a category", an affirmation made by the Colombian author after posing the lack of criticism and the practical nature of accounting education.

The approach made to accounting training processes presents diverse and discussed postures from the horizons of education within the framework of pedagogy as a social and philosophical reflection on educational processes, but there are few approaches from other disciplines of education, including didactics among them, even with the progress that the discipline presents since the last two decades of the 20th century, especially in countries such as France, Spain, Germany and the United States; and also having important referents in Colombia.

From this search, it emerges a concern for the thought and epistemology of the teaching staff responsible for teaching accounting at university level and, in front of that, the semantic school of scientific theories with the epistemological proposals of Ronald Giere and their applications to the teaching of science are taken as the guiding principle.

In order to extrapolate the semantic posture and its implications in educational research in accounting, emphasizing the teaching of accounting as an academic discipline, it became necessary to generate a methodological design guided by the description of a theoretical gap, since research in accounting education, especially in Latin America, including Colombia, have a high content of pedagogical discourse, but it is not usual to find categories directly linked to the field of didactics of science.

It is for this reason that the methodological design is not a description of processes after theoretical reflections and the intrepidity of problems is a starting point even for the same tracking of theories, research problems, antecedents and proposals; reason for which it identifies a research of a mixed nature, with a first moment of bibliographical revision guided by the principle of initial data of the reasoned theory of Strauss & Corbin (2012), to pass through a measurement of quantitative nature through Likert type surveys and to end with a qualitative moment of discourse analysis that allows to establish teachers' models of thinking about accounting and its teaching according to a consequential conditional matrix proposed by the same authors.

These methodological guidelines allow to establish four models of teachers' thinking and to determine a distancing between the epistemological and sociological notions of accounting and the teaching exercise, establishing that teachers' thinking shows diverse elements in the scientific nature, contrary to a discourse on teaching that exhibits a primacy of empirical disciplinary content.

Starting points and problematization

The central category of research is the cognitive model of school science proposed by Izquierdo-Aymerich & Adúriz-Bravo (2003, 2005) according to the semantic approach of the theories mentioned by Rengifo-Castañeda, which these authors relate to the teaching of natural sciences.

The cognitive model of school science concept is defined as a characterization of the science proper to the school environment, understood as "a cognitive and discursive activity", proposing as main objective as described by González Galli, Adúriz-Bravo, & Meinardi (2005)) "A unifying vision of closeness between scholarly science and school science, because of its (representational) semantic conception of scientific theories" (p.2).

This conceptualization requires a differentiation between the two types of scientific models that are of interest for the development of the present text: scholarly models and school scientific models.

Scholarly scientific models are those developed within the scientific communities, with a sophisticated language and support framed under the guidelines of the specific discipline, while the school scientific models are those that are developed in school activity, they have simple explanations at the beginning, but tend to become complex because of students' evolution; concepts that are related in Izquierdo-Aymerich & Adúriz-Bravo (2005) and González, Adúriz-Bravo, & Meinardi (2005).

From these theoretical postulates of the didactics of sciences, it is developed a research titled: "Models of school scientific knowledge in a group of teachers of university programs of Public Accounting", which is guided by the question: What are the models of school scientific knowledge that teachers of university programs in public accounting have?

In order to establish these models, there are taken into account the criteria established by Thagard (1992), cited by Bahamonde (2006) in his doctoral thesis led by Aduriz-Bravo as elements of a cognitive model of fundamental school science to establish general elements on the paradigm of teachers' thinking or Pedagogical Knowledge of Content; these criteria are as follows:

1. Criterion of information.
2. Criterion of propositional content.
3. Criterion of rationality.
4. Criterion of reasonableness.
5. Contextualization criterion.
6. Consistency criterion.
7. Criterion for opening to new problem areas.

The contextualization of the teaching of accounting in accordance with the internal developments of the discipline and the novel perspectives in teaching and learning that disciplines such as didactics presents, constitute the elements to visualize, once these criteria are established, and their depth and content are observed within the processes of teaching accounting.

Methodological design

The research was carried out from a mixed research approach, starting with a bibliographical review and then presenting a quantitative analytical study at first, whose results are exposed to a triangulation through a qualitative study of data, categories, codes and models, through a comprehensive observation of the unit of analysis.

The unit of analysis consists of the significant models and propositions presented by the teachers, and the conceptual and theoretical schema of each of them, in search of common topics that facilitate the theoretical saturation necessary to arrive at acceptable conclusions. For this reason, this research is characterized as being inductive in positing postures from the statements and notions expressed by the subjects; and generative and constructive when postulating theoretical explanations.

The study was carried out in two university public accounting programs, characterized by face-to-face methodology; it was taken a reference sample of 15 teachers, graduated as public accountants with at minimum a master's degree, selected for quantum-qualitative studies, to later focus on the determination of models in a subsample of five teachers whose activities are carried out in areas other than the Public Accounting curriculum, but who teach subjects linked expressly with accounting knowledge.

To achieve the determination of the models according to the criteria described, three moments are proposed:

1. Review of technical literature on the training of accountants at university level, based on literature developed in national journals but matching to these concepts, other concepts and results of international research.

For this, it was used a literary revision by databases as a narrative revision in order to structure an initial theoretical framework (Letelier et al., 2005 cited by Vera, 2012), that was comparable to the contents of research in teaching sciences, related from the objectives of the investigation.

For this, it was established that the content proposed in articles would be searched through five keywords: accounting education, accounting training, accounting teaching, accounting models, accounting teachers; in the most important journals in three contexts starting from the Colombian one, passing through the Latin American and reaching the international (context).

It was decided to review the publications of the last five years of the journals *Cuadernos de contabilidad*, of Pontificia Universidad Javeriana de Colombia; *Lúmina*, of Universidad de Manizales; *Revista de Contaduría*, of Universidad de Antioquia; and *Revista Internacional Legis de Contabilidad y Auditoría*, in the national and Latin American field. At international level, there were revised the *Journal of Accounting Education*, *Accounting Education: An International Journal* and *Advances on Accounting Education*, aiming to extend the spectrum to a maximum of ten years and taking into account that the references indicated a greater number of magazines and numbers. These magazines are the best qualified in the categories: national, regional and international.

2. Subsequent to the theoretical narrative analysis, two research instruments were presented in relation to the saturation of the categories that frame the investigation, the first one for the purposes of initial determinations, which has a more descriptive and attitudinal content; the second one focuses more on the conceptual, theoretical and epistemic aspects.

3. Finally, a third instrument allows to establish practices and use of languages and facilitates a triangulation of the data obtained, with the aim of establishing direct and indirect relations from the theoretical reconstruction and the two initial instruments.

This process is mediated at all stages by the grounded theory, the instruments used at the first moment of the research, for the purposes of open coding (Strauss & Corbin, 2012), are surveys developed using the Likert scales technique, which allow to stablish ideas and concepts by the group of teachers who are the subject of the analysis. Also, they allow to develop a characterization that is susceptible of analysis and broad interpretation; through these results, it will be determined the conceptions of science, the contextualization of the theoretical models in favor of the school scientific activity and the connection between diverse types of knowledge owned by the groups, framed in the initial narrative of the theoretical corpus and the elements proposed as theoretical references from the field of didactics of science.

This instrument is framed in the methodological proposal of Tamayo Alzate, Sánchez & Buriticá (2010), who through an instrument with open questions and discussion scenarios pose the identification of teachers' science conceptions, within the framework of the nature of science.

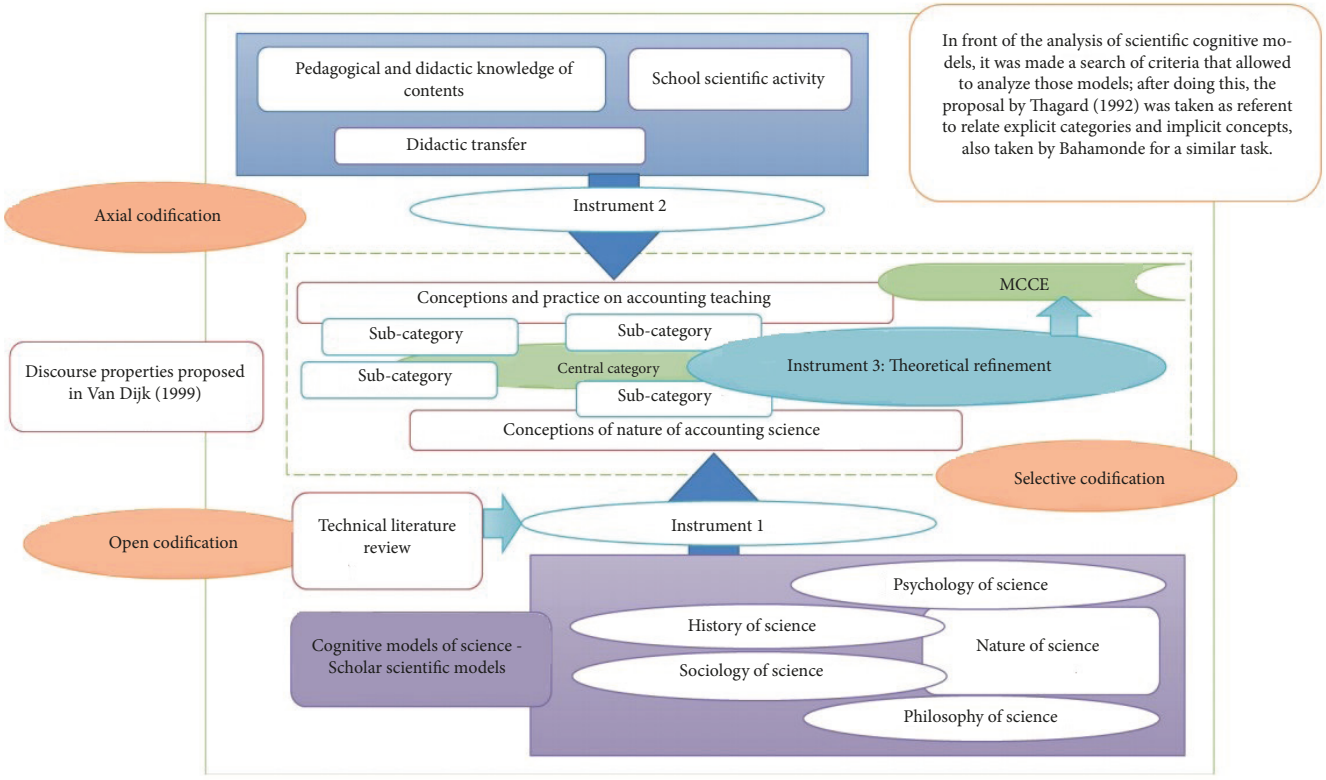
In that research, six emphases were proposed according to the proposals of Cobern and Loving, 1998; cited by Tamayo Alzate, Sánchez, & Buriticá (2010): theoretical (T), empirical (Em), antiscientific (Ac), scientific (Ci), cultural (Cu) and equilibrated (Eq); these are adopted at the first moment of the analysis.

These emphases are used in the first instrument, although for the two later instruments we searched for more accounting notions, based on positions consistent with Cobern and Loving, such as those shown in the fields that define the areas of deepening and the curriculum in accounting discipline.

For the development of the present research, it is proposed that the Likert scale serve to make initial determinations that guide the discussions of instrument two and allow specific theoretical saturations from instrument three, which do focus more on the interviews proposals of Strauss & Corbin (2012); although the third instrument does not present direct interviews, it creates notions through scenarios that later concentrate the questions proposed earlier, all this should be either descriptively or critically framed in the positions found in the documentary review initially proposed and the content taken from the didactics of the sciences.

After obtaining these data, it was developed a confrontation with the notes obtained in the surveys and their respective interpretations; and it was established the conceptual significance expressed by the teachers in terms of the scholarly scientific perspective, the propositional content according to the thematic nuclei and the conceptual rationality implicit and explicit in the teaching discourse, as well as the contextualization of the theoretical models in favor of the school scientific activity.

Ilistration 1. Methodological design



Review of technical literature and initial theoretical saturation

After reviewing the technical literature, the review of 26 articles published in the Latin American and Colombian academic accounting contexts, written in Spanish, and 24 articles in the international field written in English, for a total of 51 publications with some identifiable content such as didactics nature. In this process, it is necessary to highlight two articles reviewing academic publications between 2009 and 2013: one on Latin American writings developed by Loaiza (2011); the other in the international context of Apostolou et al (2013).

From this review, it was possible to establish that the researches from the field of didactics and its relation with accounting as academic discipline are scarce; in this group we can find a series of investigations related with the object of study of the teaching of sciences, but they do not specify it directly.

When analyzing in a global way, didactics of science has permeated the teaching and learning of the natural sciences and mathematics deeply, and social sciences such as geography and history in an incipient but remarkable way; it is not possible to assert that there have been generated significant attempts to develop a specific didactics of accounting or in the other areas of management and organizations.

In Latin America and Spain, it has been attempted to address the theoretical content of science didactics since the late 1980s and early 1990s, but it is clear that in terms of accounting, the field is declared as unexplored, although there is a wealth of pedagogical reflection, especially in Colombia.

The main attempts to present research that investigate or propose elements around the teaching and learning of accounting as an academic discipline start from theories, precepts and pedagogical positions, but they do not offer significant approaches to the other disciplines recognized in the sciences of education.

At Latin American level, Selter's (2001) research has established that the teaching of accounting is mediated by pedagogical discourses of marked sociological and philosophical content, but in which there are not elements proposed to generate a significant evolution in the teaching exercise in accounting, teaching is instructional, even though many contents have been glimpsed as necessary for the training of an updated and critical accountant.

In Colombia, two investigative processes have yielded important diagnoses about teaching practices, although these do not necessarily emerge from the content of science didactics within the framework of the educational sciences: Zambrano (2012) analyzes the content of textbooks in accounting and establishes that they work within the framework of the transmissionist pedagogy; and that the teachers find comfort in this type of publications, since they facilitate a thoughtless, instructional education.

Leon-Paime (2013) raises important elements for the understanding of teaching practice in accounting. The researcher starts with a critical reflection from which it is established that the attitude of teachers towards teaching presents a certain evolution in Colombia, given the imprint of new notions of training and the consolidation of a mass that is critical towards scientific publications in accounting from the universities. Subsequently, he problematizes teaching in accounting constructed through teachers' narratives, which in the first instance allows him to weave a relationship between the exercise of the profession in the framework of the organizations and the teaching practice, under the premise of the contextualization of the knowledge. This perspective becomes novel for educational research in accounting, and relationally generates a recognition of didactic notion, especially when analyzing the teaching discourse as a fundamental element of the formative process and the construction of critical thinking of disciplinary content.

Then, he analyzes the development of teaching in management accounting and allows to visualize how the teacher proposes the diverse approach of the content in this field, that is to say, as pedagogical and didactic knowledge development of the content in management accounting, through interviews to teachers in the area (León-Paime, 2013).

In this research, Leon-Paime manages to establish that teaching practices achieve a relevant contextualization thanks to the professional experience of the teacher, although this can generate that training be instructional in some senses, managing to conclude that accounting from the teaching discourse is understood as a functional exercise through particular logics, that mainly emanate from economic organizations, which calls into question the autonomy of accounting disciplinary content, and thus its independence and freedom (Leon-Paime, 2013). From both investigations emerge epistemological notions of teachers, which constitutes a pioneering exercise in the field of accounting didactics in Colombia.

Mediated by the state of the art constructed by Loaiza (2011), in which the Colombian author points out sixteen fundamental concerns of the Colombian accounting academy on accountants training, the following points should be highlighted in relation to the object of research study:

- The notorious impossibilities on the teaching of dynamics and movements that appear outside the university circle.

- The concern for training in critical thinking, a situation that is especially considerable in relation to the postures posed from the general field of didactics and that in accounting research in Colombia are notorious in Rojas Rojas (2002), Cardona & Zapata (2006), Gómez Villegas (2006), Cortés (2006), Barragán (2008) and Cuenú Cabezas (2010), which in Latin America are part of the final research concerns developed by Selter (2001) and Skliar (2002).

- The way how scientific knowledge is handled in the classroom, a topic addressed in Colombia by professors Gómez (2006-2009) and Giraldo (2006), who have elucidated real problems in the practice of accounting profession and scientific research in accounting in virtue of the attitude of repudiation towards the teaching and learning of theory and accounting epistemology.

- The role of the teacher and the student, a topic addressed by Barragán (2008), who describes a comfort in the construction of institutional discourses that are not legitimized through teaching actions. Giraldo (2006) concludes the existence of acceptance by the student towards the instrumental and pragmatic formation, and of the teacher towards the construction of tools for technical education and traditional hetero-structuring education.

Sánchez (2011), who emphasizes that teacher training processes have not substantially changed teaching systems, allowing traditional education to remain under the guidelines of what he calls industrial pedagogy.

Cuenú (2010) shows that public accounting programs are subject to instructional systems where scientific education is not promoted, and where it is remarkable that students do not reach these university programs seeking science education, which ends up generating structures supported by the Institutional vision of labor competencies.

Gómez Villegas (2007a) establishes in his investigations that the teaching of scientific precepts in accounting is an uneasiness, since the teaching of the discipline generally accommodates around the instrumental knowledge, given a marked goal of professionalization defended by the majority of the academic community.

- Cultural training in accounting education, which seeks to build a culture around accounting and its contributions to development and social welfare, highlighting in this regard the contribution of Rojas (2006) around the implications of the humanities in the training of accountant public.

- The pragmatic nature of international standards, when referring to the regulative orientation of accounting education, a topic addressed by Gómez Villegas (2007b), who critically observes the contents of International Education Standards issued by the International Federation of Accountants (IFAC), establishing that these standards have a search for skills of a labor nature, while ignoring the training act as legitimately formative in the discipline.

In this same line, Gómez (2007b) concludes that the standards already cited generate an ethical appearance that does not discuss technical and procedural elements, thus ignoring the disciplinary nature of accounting knowledge, conclusions that had echo, consonance and support in later works, such as Barragan 2008), León-Paime (2009), Cuenú (2010), Sánchez (2011), and that had significant antecedents in works developed by Cardona & Zapata (2006), Martínez (2002) and Rojas (2002).

- Curricular interdisciplinarity, discussing the fractional nature of training plans and discourses of the programs, being latent a more interdisciplinary training vision, with more academic and less technical contents, a situation supported by Martínez (2002), Cardona & Zapata (2006), Cortés (2006) and Machado (2009).

- Importance of reading as a basis for the formation of poli-causal, critical and creative thinking, by establishing deficiencies in skills necessary for the construction of scientific knowledge, a situation corroborated in research whose results were presented in Cortés (2006), Rojas (2006), Giraldo Garcés (2006), Gómez Villegas (2007a), Martínez Pino (2008) and Cuenú Cabezas (2010).

- Lack of teachers with adequate training, the investigated elements allowed to determine a lag in graduate, pedagogical and didactic education; such situation was established by García (2009), Cuenú (2010) and Sánchez (2011).

In the context of publications in the most internationally recognized accounting education journals, it must be highlighted the bibliographic research published by Apostolou et al (2013), in which it is presented a review of the international accounting education publications, and the six major journals of the field in the world: *Journal of Accounting Education, Accounting Education: An international journal, Advances in Accounting Education, Global Perspective on Accounting Education, Issues in Accounting Education* and *The Accounting Educator's Journal*. In this paper, researchers argue that scientific publications in accounting education are grouped into four broad categories: 1. Curriculum, 2. Educational technology, 3. Faculty subjects and 4. Students.

After reviewing this document, it was found that the articles (that were) related under the category *subjects of faculty* possess an interesting amount of references on teachers' training; the *students* category contains attractive didactic positions; and the *curriculum* section also includes some notions with didactic content; but it is determined that research around training processes in accounting is focused at international level in curricular, pedagogical and educational management issues; didactic postures, models of school science, teacher training and better teaching practices are understood as secondary, a situation similar to that presented in the Colombian technical literature, and Latin American in general.

When naming research around the curricular theme with didactic notions, it is necessary to refer to Tegarden, Sheetz & Henderson (2010, pp. 475-489), who argue that training in accounting should focus on the formulation of authentic problems, which is why they establish that curricula in accounting must contain conceptual teaching processes through maps and cognitive profiles intended to improve in students attitudes and problem solving.

This notion is similar in some aspects to the proposal of the Cognitive Model of School Science (MCCE, for its initials in Spanish), since it seeks that teachers focus on the determination of previous ideas and approaches around knowledge, before facing the contents to be taught.

Starting from a critique to the traditional curricular structure of accounting in English-speaking countries, Curtis (2011, pp. 195-202) mentions the scarce research in the area of formative assessment in accounting; he proposes the development of assessments that allow the determination of deficiencies in the learning processes, from which the curricular structure and the way in which the teacher faces the teaching be modified; this exercise has been tested in a state university of the United States, showing significant improvements in both the processes of learning and teaching.

In this same line of research, Simkin et al (2011, pp. 27-44) present an analysis of the effectiveness of the multiple-choice questions that constitute the majority of tests in accounting education, concluding that they do not evaluate to all students at the same cognitive level, which does not demonstrate a full and adequate learning, justifying this in case studies (made) in two universities in the United States, in two subjects (Financial Accounting and Accounting Information Systems) and four semesters.

Thibodeau, Levy & Osterheld (2012, pp. 25-40) consider that it is required the introduction of novel elements in the accounting classroom, so they propose role play exercises and interaction with practicing professionals, improving skills, concepts and the ethical understanding of the raised problems.

Crawford, Helliar & Monk (2011, pp. 120-128) state that for UK academics, analytical, communicative and argumentative skills are fundamental to optimal accounting performance, and therefore curricular and teaching modifications are proposed in order to enhance these skills over others of a more technical and operational order. In this sense, Bui & Porter (2010, pp. 26-45) suggests that there is a gap between what accounting students learn and what the entities for which they work in New Zealand are looking for, concluding (that there's) a need to examine improvements in teaching in order to make the development of the competencies proposed in the curriculum more effective.

Keneley & Jackling (2011, pp. 608-619) present results of a research in which Australian students were surveyed, seeking to establish skill-achievement perceptions in order to determine the functionality of teaching; they established a problem of disinformation that does not allow clear notions of processes such as problem solving, adaptation to new situations, behavior and ethics, logic, among other aspects; establishing that there is no greater empowerment of the learning process.

In the same line of curricular approach, Fortin & Legault (2010, pp. 96-120) set out the mixed approach to teaching applied to accounting programs at L'Université du Québec Trois-Rivières in Canada, showing that by measuring students through a periodic test show that the so-called mixed teaching approach allows for class approaches that go beyond traditional teaching, and that it powers skills and competencies that are not strengthened under the instructional approach.

In the category *faculty subjects*, it is highlighted a German paper in which the pedagogical beliefs of teachers are analyzed, Seifried (2012, page 509) presents an exploration of the technical literature in accounting education in Germany, referring to two research moments (the first one is quantitative, by means of a survey; the second one is qualitative, by means of an interview for a subsample), establishing three teaching orientations: constructivism, instructionism and systemism. Seifried concludes that the training of German teachers in accounting-related programs uses techniques that tend to practical and operational aspects, mediating their classes with informative and non-conceptual statements, which must lead that teacher training be focused on improving teacher-student relationships, and not only about the knowledge of the area to be taught.

Braun & Sellers (2012, pp. 270-276) present research results on how the teacher-student relationship is constituted; they find significant difficulties and non-positive perceptions on the part of the students, who believe that accounting professors in some universities of the United States show an abandonment of their learning, establishing a disrespect for the results of the students, concluding that no learning styles are determined and therefore, teaching is conceived as a standard process.

Research about students, their learning and the importance of knowing their notions about teaching constitute a series of products that can be understood as of high didactic content; in many cases, there occur expressions such as critical thinking, teacher thought, argumentation, cognitive models, among other relevant categories.

One of the most relevant investigations in this field is one developed by Jones & Wright (2011, pp. 9-22) (who together with Jermakowicz and Hayes are identifiable as the most important English-speaking authors dealing with issues directly related to accounting teaching). They investigated the relationship between different cognitive styles and students' performance in accounting introductory classes, as well as the influence of these cognitive styles on the accounting specialization decision, determining that depending on the cognitive style, different trust relationships are established in the referenced theoretical and pragmatic frameworks; they also inquired about the analytical perception around them. This study, which was carried out at a Canadian University, concludes that the determination of cognitive styles is positively associated with deep learning in accounting and with the decision of specialization.

Sin, Reid & Jones (2012, pp. 327-335) investigated student concepts about accounting and work derived from it; they initially raised three rationales: routine, meaningful and moral. The achievement of students' perceptions, it is concluded that it is necessary to meddle with new didactic resources aimed at facilitating students' understanding and developing on them a concept about the importance of accounting in today's society.

Triki et al (2012, pp. 100-104) argue that during the development of a curriculum in accounting in Canadian universities, it is affected by three student-specific situations in that context: *anti-intellectualism*, which favors memorization and does not allow the development of critical thinking; *high tolerance to ambiguity*, from which the work of the teacher is almost always perceived as a threat; and the *locus of control*, under which no intellectual authorities are determined. The study establishes that the highest indexes of these situations are presented as students progress in their training process, and although it occurs, the locus of control is lower than the anti-intellectualism and the tolerance to ambiguity.

From a similar point of view, Braun & Sellers (2012) argue, based on a research developed in several American universities, that it is necessary to deploy didactic elements from which students develop an empowerment of their learning and learn to mediate it autonomously; a qualitative analysis suggests that motivation is fundamental for learning the most complex concepts in accounting, since in an autonomous way and knowing the aims and means of teaching used by their teacher, the students prepare (for) their classes, learn the materials and are more participatory than when everything is directly linked to the instruction and the sanctioning qualification.

Ravenscroft, Waymire & West (2012, pp. 710-728) present a three-variable examination of the evaluation process in accounting programs at US universities: "exam performance, the gap between the expected exam grade and the actual result (calibration error), and student beliefs about learning and ability (mentality)". The study concluded that:

1. The test score was inversely related to calibration error.

2. The mentality was not a determining factor of the qualification of the examination, and

3. The growth mentality was associated with both improved performance and decreased miscalculation (Ravenscroft, Waymire & West, 2012, p.728).

Phillips, Alford & Guina (2012, pp. 1001-1014) established the importance of association by linking to accounting teaching illustrations that facilitate learning, and these strategies are exposed to analysis based on evidence that establishes retention and transfer of concepts after the use of these materials. At the end of the process, it is possible to conclude that the graphical content improves the comprehension of the text in students in general accounting courses.

Other investigations, such as the one by Stevens et al. (2010, pp. 35-42), carry out a study on the relevance and ways of selecting textbooks; in this sense, a group of North American teachers is questioned on the contents of a text, the availability of auxiliary materials, equipment and text editing, determining that the only consideration for the selection of guiding texts is the teacher revision, although these notions are reconfigured from the descriptions of the same faculty.

From a similar line, Ferguson et al (2010) analyzed the relevance of textbooks for teaching accounting in the United Kingdom, taking as a population the accountants enrolled in the British Accounting Association (BAA) with dedication to teaching financial accounting, through surveys and semi-structured interviews. The British researchers managed to conclude that "the textbooks do not adequately present the needs of all stakeholders in the accounting process" (Ferguson et al, 2010, page 514).

In the framework of learning research, academic culture and cognitive models of accounting students, Sugahara & Boland (2010, pp. 236-251) evaluated the relationship between culture and learning style in the context of deep learning in accounting students in Japan and Australia. They used four categories to frame learning styles: concrete experiences, abstract conceptualization, reflexive observation, and active experimentation. These categories were contrasted with five categories that defined cultural differences: individualism, assertiveness and competitiveness, power distinctions, uncertainty control, and policy orientation and decision making. The conclusion of the study is that cultural characteristics do significantly modify learning and indirectly oblige teachers to confront teaching, depending on cultural characteristics; it also showed that a large percentage of students tend to reflexive observation, active experimentation and individual exercise, above theoretical-critical reflection and the exercise of formative research.

From a similar perspective, Honn & Ugrin (2012, pp. 991-995) posed after analyzing student performance in financial accounting classes, introduction to accounting and accounting information systems in two major US universities, the existence of a "cognitive misfit," which they define as "the incongruity between the students' cognitive style and the cognitive demands of an accounting task," analyzing how this hypothetical mismatch affects school performance. In the end, it was determined the existence of a cognitive mismatch between the student's style and the proposed tasks, since the cognitive style is not recognized when proposing a task in accounting; in many cases, it was identified that the activities proposed by the teacher do not guarantee learning, the qualification of the task does not represent the effort made by the student in favor of the achievement; it was also determined that when there is congruence between the proposed task and the cognitive style, the performance is much higher.

Research results: teachers' positions on the nature of accounting knowledge

This number of theoretical notions about teachers' thinking in accounting and the attitudes of the subjects of accounting education are contrasted with the results of the proposed instruments to be considered in the face of a specific theoretical explanation.

In terms of results and for the determination of cognitive models, it is necessary the application of principles of information economy; in that sense, it was exposed in the beginning a Likert Type survey to a group of fifteen teachers of two university state accounting programs.

By exposing teachers to the survey, guided by the six proposed in Cobern and Loving, (1998) quoted by Tamayo Alzate, Sánchez, & Buriticá (2010), general trends are observed regarding the discipline around the nature of science; this was transgressed by the concept of the nature of accounting knowledge possessed by each teacher subject to the analysis.

The balanced emphasis, which shows an agreement that accounting is a product of culture with epistemic and theoretical density, from which all the explanations about its possible objects of study are not clear, it is obtained important acceptance with 93% and statements which in most cases are completely in agreement; the same percentage is presented in the theoretical and cultural emphasis, although the agreement with the statements is not demonstrative; for that reason, no significant differences are established from the quantitative analysis, marked consensuses are not reached, and notions and perspectives on the nature of accounting knowledge in the group of teachers are not established.

An agreement is established, although not so conclusive in the case of rejection of anti-scientific statements; emphasis in which it is highlighted rejection by explanatory and positive accounting, in which only 27% of agreement is reached; in addition, for the case of scientific and empirical emphasis, a 67% is reached, which does not show a disapproval but establishes a contrariety with the technical literature, which established an empiricist and positivist notion in accounting, especially in the ones dedicated to university education. This shows that although teaching is technical and scientific, the scientific concept of teachers is broader and more complex; for this reason, a didactic problem is perceived as a priority over a problem in the epistemology of teachers for the Colombian context. See graph 1 on the following page.

Graph 1. Acceptance degree of emphasis in the group of teachers subjected to analysis

It is possible in face of the data presented, to establish a series of tendencies, as that those who accept the balanced emphasis tend to accept also cultural and scientific notions, rejecting empiricism and anti- scientific notions. This allows us to establish disciplinary positions on the search for epistemological positions on accounting and its current condition, which in the future promotes differential modeling of curriculum and teaching (see table 1).

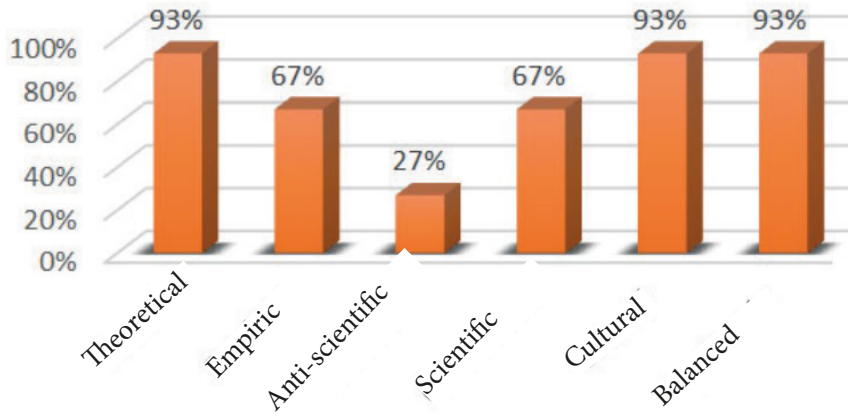


Table 1. Acceptance of emphasis for each teacher subjected to analysis

Emphasis	Theoreti-	Empiric	Anti-scientific	scientific	Cultural	Balanced	Summary
PI1-A1-CFI	Yes	Yes	No	No	Yes	Yes	T-Em-Cu-Eq (+Eq, -Ci, -T)
PI1-A2-CFT	Yes	No	No	No	Yes	Yes	T-Cu-Em (+Em, -Cu)
PI1-A3-CAC	Yes	Yes	No	Yes	Yes	Yes	T-Em-Ci-Cu-Eq (+Eq)
PI1-A4-AYC	Yes	Yes	No	Yes	Yes	Yes	T-Em-Ci-Cu-Eq (+E, -T, -Em, -Ci)
PI1-A5-TER	Yes	No	No	Yes	Yes	No	T-Ci-Cu (+T)
PI2-A1-CFI	No	No	No	Yes	Yes	Yes	Ci-Cu-Eq (+Eq, -Ci)
PI2-A2-CFT	Yes	Yes	Yes	Yes	Yes		T-Em-Ac-Ci-Cu-Eq (-Ac, -E, -T)
PI2-A3-CAC	Yes	Yes	No	No	Yes	Yes	T-Em-Cu-Eq (+Eq, -T)
PI2-A4-AYC	Yes	No	No	No	No	Yes	T-Eq (+T, -Eq)
PI2-A5-TER	Yes	No	No	No	Yes	Yes	T-Cu-Eq (+Eq, -T)
PI3-A1-CFI	Yes	Yes	No	Yes	Yes	Yes	T-Em-Ci-Cu-Eq (+Eq, -Ci, -Cu)
PI3-A2-CFT	Yes	Yes	Yes	Yes	Yes	Yes	T-Em-Ac-Ci-Cu-Eq (-Ac, -Cu)
PI3-A3-CAC	Yes	No	Yes	Yes	Yes	Yes	T-Ac-Ci-Cu-Eq (+Cu, +Ci, -Eq)
PI3-A4-AYC	Yes	Yes	No	Yes	Yes	Yes	T-Em-Ci-Cu-Eq (+T, +E, -Ci, -Cu)
PI3-A5-TER	Yes	Yes	Yes	Yes	Yes	Yes	T-Em-Ac-Ci-Cu-Eq (+T, -Em)

This consolidation of information is achieved after the analysis of the fifteen cases in a particular way; for example, in the case of teacher 2, it is presented acceptance of three of the six proposed emphases (theoretical, cultural and balanced).

Table 2. Analysis specific for teacher 2

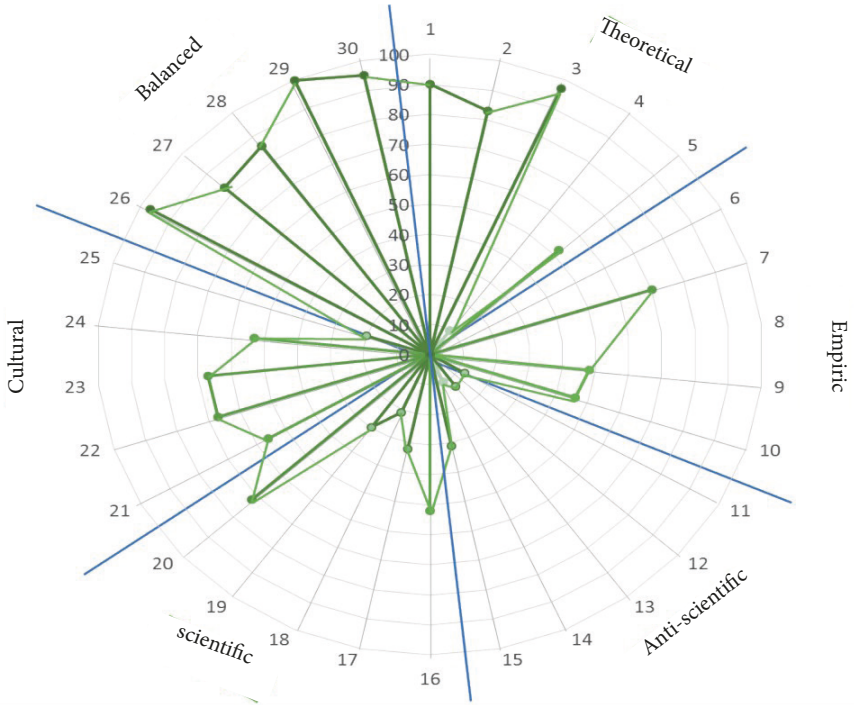
Emphasis	Theoretical	Empiric	Anti-scientific	scientific	Cultural	Balanced	Summary
PI1-A2-CFT	Yes	No	No	No	Yes	Yes	T-Cu-Em (+Em, -Cu)

It is notorious the acceptance of the balanced emphasis in three of the five statements that belong to this emphasis, an agreement superior to 90% is presented; while in the other two, they surpass the 80% of acceptance. The theoretical emphasis presents important values, although not as high as in the balance; in three of them, they possess 90%, 83% and 97% of acceptance, although the affirmation contained in the other two statements is rejected.

For the case of cultural emphasis, acceptance is determined since three of the five proposed statements have values between 53% and 67%, although they are not high values; and in one of these items, only 20% was reached, which determines a moderate acceptance. The scientific and anti-scientific emphasis are openly rejected, no statement of antiscientific emphasis exceeds 30%; and in the case of the scientific, four out of five statements do not exceed 50%, and the latter constitutes an anomaly by marking 72%.

For the empirical emphasis there are very low acceptance values, two of the five statements are openly rejected, and two of the remaining ones are located at a level of 46% and 48% respectively, the latter constitutes an anomaly by reaching 70%.

Graph 2. Trends NOS- Teacher No 2



In the case of teacher 12, in order to present another case in contrast, a series of non-clear postures is presented, by generating acceptance of all the proposed emphases.

Table 3. Analysis specific for teacher 12

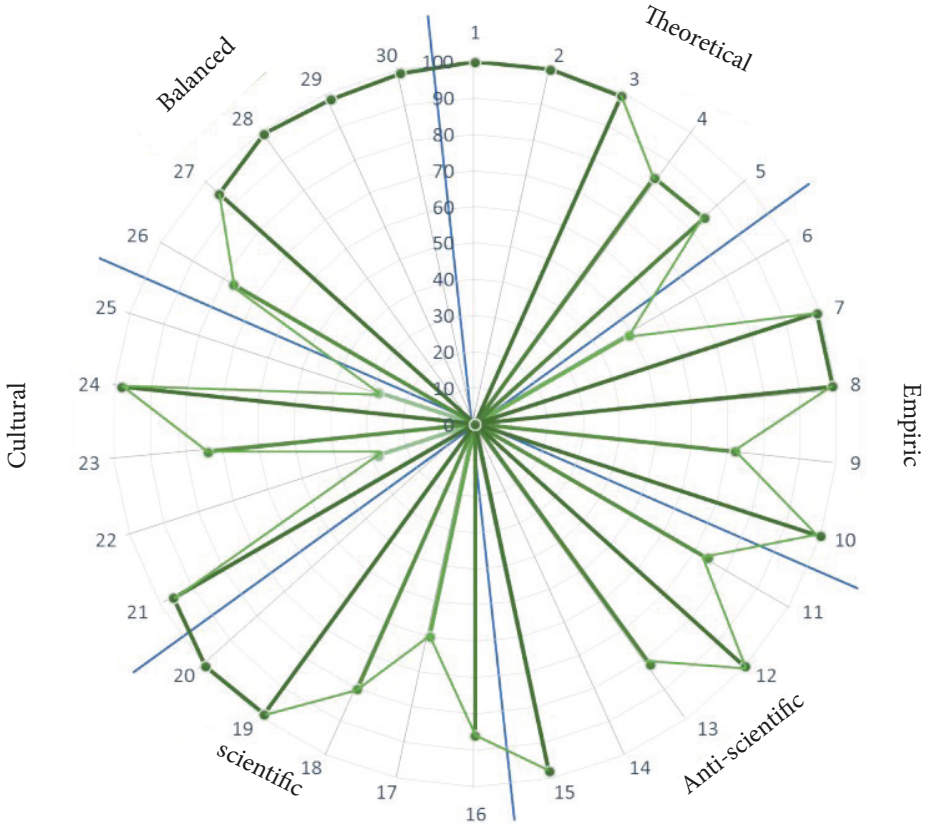
Emphasis	Theoreti-	Empiric	Anti-scientific	scientific	Cultural	Balanced	Summary
PI3-A2-CFT	Yes	Yes	Yes	Yes	Yes	Yes	T-Em-Ac-Ci-Cu-Eq (-Ac, -Cu)

Again, there is a marked tendency to accept the balanced emphasis above the others, with four of the five utterly accepted statements, and the fifth reaches a 77% acceptance. The theoretical emphasis indicates similar degree of conformity, three of the five utterances are fully accepted and the remaining two show acceptance of 84% and 85%, respectively.

For the remaining emphases the data are more irregular, the empirical emphasis shows total acceptance in three out of five statements, the acceptance complements the response to the fourth with 72% agreement, but the latter only shows acceptance of 49%. The scientific emphasis shows a situation similar to the empirical emphasis, there is a total acceptance of two utterances, while another two reaches 86% and 80% respectively, the last statement only reaches 60% acceptance.

The anti-scientific emphasis presents higher data for this case than for other teachers, two of the statements are completely accepted, two of the five oscillate between 75% and 85% of acceptance, the last statement shows a total disagreement, establishing an anomalous and irregular data.

Graph 3. Trends NOS- Teacher No 12



Given this situation and making it clear that only two of the fifteen cases are presented in this article, it is possible to define an incongruity in the positions that professors of public accounting programs have on the nature of accounting as an academic discipline.

Given this panorama, the investigation continued with the application of two instruments with discursive content, applied to a subsample of five teachers in order to generate saturation categories and establish historical-epistemological and pedagogical-didactic postures.

Historical-epistemological and pedagogical-didactic postures

Axial codification allowed the determination of balanced notions of science, but with broad acceptance of cultural and theoretical notions, which allowed to establish that the teachers who were part of the study define science as a human activity, naturally explanatory when it is part of the set of the social sciences, and that it is a result of culture.

The investigation of the nature of science establishes that the postulates produced by the research correspond to a moment of history, and that they are validated by reason of the context, territory and culture. In addition, it was established that teachers agree that science has practical value, but contrary to what is stated in the technical literature, they are not completely empiricists, they emphasize the value of theory and the human nature of those who investigate, who seek concepts and useful explanations that help the development of human beings, peoples and their own culture.

Even so, the teachers explain that the problem of empiricism in accounting has its genesis in the formative process that they themselves manage. Including the concepts of nature of science, the teaching discourse, the version that they have of accounting teaching and the relation with the advance of the discipline, it is emphasized the technical and instrumental education for reasons of the ignorance of didactics and its implications in disciplines such as accounting.

The generalities about technical and instrumental formative process are repetitive both in the search for notions of the nature of science and in the teaching discourse; it is repeated in ten of the fifteen teachers in a marked way; in addition, it appears indirectly in three of them. In the discourse enunciated by four of the five teachers exposed to interview and scenarios for the analysis, it is established the existence of technical and instrumental training, and the fifth teacher does not discuss the existence of that problem.

Faced with this situation, it is possible to establish that technical-instrumental teaching is central, but the notion of teachers' science is not purely empirical, which is why it is called that what exists in this field is a problem of teaching, of translating scientific content in the accounting classroom; this allows to nominate as central category the dichotomy between accounting research, accounting theory and accounting teaching. The central category from the problematization is the knowledge of the teaching staff about the specific teaching of accounting, since their ignorance in didactic terms makes undeniable their existence, content, parts and notions; determined all this thanks to the presence, repetitiveness and force in the unit of analysis.

In the context of the didactic content, teachers recognize the relevance of scholarly science, although they do not have conceptual clarity from the teaching of sciences, they recognize that the elements of accounting research that are taken to the undergraduate training process are very few.

In front of this, they clarify that accounting has been transformed by reason of the act of the accountants and as product of the formative process in an instrument inefficient to respond to what society demands of it; besides, it does not to apply tools from which the performance of accounting can be made more efficient, depending on the characteristics of the entities. It is possible to establish that Colombian accounting is supported during its teaching in the belief of the use of the owner by the professional, generating relevance in the information for purposes of taxation and state revision.

Conclusions: models of school scientific knowledge in accounting professors

When investigating the notions about the nature of accounting science, we can establish that accountants (contrary to the imaginary and social concept) are not purely empiricists, they link the content of science with cultural and anthropological concepts and understand the limitations of scientific research, but they emphasize the importance of the theory and the scientific method, to later define that the way in which they teach is very far from what they know about science.

There is a marked disagreement with the technical literature, especially at national level, where the teachers' position is criticized from the pedagogical perspective and from the philosophy of education, when the results support the fact that the teacher is a product of culture and training processes (that are) far from the search for scientific accountants, who be critical and socially contributory accountants beyond its practical and utilitarian exercise, thus managing to conclude that the greatest problem of accounting education lies not in the express scientific content, but rather in a great didactic problem that seems to obscure its dimension, a problem that also exists in the epistemology of teachers.

When we analyze, one by one, the notions of the five professors who are the subject of deep analysis, we can establish that teachers have a notion of science as a cultural content, and it is emphasized the importance of research and the scientific method, as well as having a significant conceptual significance in its field; it is evident that the scientific content of language is lost when teaching accounting theoretical models, its content in accounting science was not transferred at the teaching moment, at doing a practical teaching by curricular and cultural questions that do not allow it in many moments to establish in front of the students their position and the different perspectives in front of the scientific aspects of the accounting academy, reason why the classroom is not a space for the investigation and the constructive criticism in the majority of the circumstances.

They have an important conceptual rationality and recognize the variables of the context, but are not discussed the implications and possible changes in the theoretical model that is being analyzed, so the content of the speech is subject to the applicable aspects of the model in the first instance; the quality of the evolution of accounting is established, but explanations around the history of accounting and the sociology of accounting are not often linked to the exercise of teaching.

Finally, teachers' training allows them to contextualize knowledge, and to transmit it in favor of its implications in society and organizations, but it does not weave clear relations and limits to the relations with other sciences, disciplines, knowledge and logics.

Faced with this, teachers make clear that the proposals developed on managerial and social accounting should already be starting to be embedded in the teachers' discourse and the formative process, helping the problem of management of entities, which is the fundamental objective of accounting as an academic discipline in the light of what teachers say; in front of this, concepts such as investment, financing, dividends, operation of organizations, profitability, heritage, utility, among others, take on importance as the foundation for a conceptual and scientific training; not an instrumental and utilitarian one.

Teachers acknowledge a problem in their didactic content, they recognize that accounting education should focus on improving the management of organizations, whatever their characteristics, which defines objectives, goals and actions from accounting in terms of their nature and from the way in which it is taught at a higher level, but they fail to establish mechanisms through which a more scientific and conceptual formation can be achieved, that really contributes to the strategic planning and control of business organizations, (and that be) studied at the light of internal and external aspects and the underlying risks of social activity that legitimize the existence of organizations.

In this same sense, they point out that their training process must bring them closer to new areas of accounting discipline, reconfigured from the knowledge of the content, the patrimonial and financial notion of traditional accounting, generating from the emerging accountings new notions and ways of understanding accounting, and consequently to teach it; opening a social version of accounting, justified through the various academic and research exercises that are being developed in the national and international fields.

From these conceptions and conceptual relations, it is established the existence of four *models of school scientific knowledge* (MCCE, for its initials in Spanish) that are present in teachers of public accounting programs university:

1. MCCE centered on orthodox transmissiveness: present in teachers whose conception of accounting science is non-existent, who consider accounting as a series of practical and operational contents within organizations.

2. MCCE from the notion of disciplinary field: in teachers whose conception of accounting sciences is skewed by their formative process and area of performance; they consider accounting as a knowledge dependent on economics, administration, law or engineering.

3. MCCE from the scientific notion of discipline: in teachers whose conception of scientific accounting is broad, they consider accounting as a series of historically developed contents with social and or undeniable implications, which deserve to be exposed to scientific research.

4. MCCE in the context of complexity: present in teachers whose conception of accounting science is plural and heterogeneous, they consider accounting a specialized knowledge with a scientific point of view.

These models show an imprint in accounting education in the 21st century, since most teachers are in the complex model, but this defines the thinking of teachers, not the exercise of teaching, which is modeled from the orthodox view.

The main problem of accounting education is the training of teachers, both in science and didactics itself, since teachers recognize the existence of a plurality of content and a potential in the advances of research in accounting, but the curricular entrapment and imaginary of accounting as practical knowledge makes

it difficult to approach novel processes and, why not, innovator ones in accounting teaching as a university academic discipline.

These results constitute an intrusion on new content, especially in Colombia, but it seeks to give an incentive to works in which it be inquired in a larger extent the thinking of the subjects involved in the training of accountants, and in other areas of knowledge such as economics, business administration or social communication.

References

Apostolou, B., Dorminey, J., Hassel, J., & Watson, S. (2013). Accounting education literature review. Journal of Accounting Education31, 107-161. [Links]

Bahamonde, N. (2006). Los modelos de concocimiento científico escolar de un grupo de maestras de educación infantil: Un punto de partido para la construcción de "islotes interdisciplinarios de racionalidad" y "razonabilidad" sobre la alimentación humana. Barcelona: Univesidad Autonoma de Barcelona. [Links] .

Bandura, R. P., & Lyons, P. (2012). Instructor care and consideration toward students What accounting students report: A research note. Accounting Education: An International Journal, 21(5), 515-527. [Links]

Barragán, D. M. (2008). Indagación sobre los discursos en de curriculun en Contaduría Pública en Colombia. Revista Facultad de ciencias económicas: Investigación y reflexión, XVI(02), 173-188. [Links]

Braun, K. W., & Sellers, R. D. (2012). Using a daily motivational quiz″ to increase student preparation, attendance, and participation. Issues in Accounting Education, 27(1), 267-279. [Links]

Bui, B., & Porter, B. (2010). The expectation-performance gap in accounting education: An exploratory study. Accounting Education: An International Journal, 19(2), 23-50. [Links]

Cardona, J. & Zapata, M. A (2006). Educación contable: Antecedentes, actualidad y prospectiva. Medellín: Universidad de Antioquia. [Links]

Cortés, J. H . (2006). El pensamiento crítico: Algunas reflexiones en torno a la educación contable. Cuarto Foro de Educación contable. [Links].

Crawford, L., Helliar, C., & Monk, E. A. (2011). Generic skills in audit education. Accounting Education: An International Journal, 20(2), 115-131. [Links]

Cuenú, J. E. (2010). Impedimentos de los estudiantes de Contaduría Pública para formarse como sujetos constructores de conocimento científicos. Revista internacional Legis de Contabilidad y Auditoría 44, 119-137. [Links]

Curtis, S. M. (2011). Fomative assessment in accounting education and some initial evidence on its use for instructional sequencing. Journal of Accounting Education, 29(4), 191-211. [Links]

Ferguson, J., Collison, D., Power, D., & Stevenson, L. (2010). The views of 'knowledge gatekeepers' about the use and content of accounting textbooks. Accounting Education: An International Journal, 19(5), 501-525. [Links]

Fortin, A., & Legault, M. (2010). Development of generic competencies: Impact of a mixed teaching approach on students'perceptions. Accounting Education: An International Journal, 19(1), 93-122. [Links]

García, C. E. (2009). ¿Qué significa hacer "pensamiento contable'? Elementos para la comprensión de algunos problemas teoricos involucrados en tal actividad. Lúmina 10, 98-144. [Links]

Giraldo, G. A. (2006). Problemáticas de la formación del estudiante de contaduría pública: la pertinencia de la actitud científica y epistemológica. IV foro nacional de educación contable. [Links]

Gómez, M. (2007). Las insuficiencias disciplinares de los estándares internacionales de educación -IES- para contadores profesionales. Lumina, 08, 24-42. [Links]

Gómez, M. (2006). Comentarios sobre el aprendizaje-construcción de la teoría contable. IV foro nacional de educación contable. [Links]

Gómez M. (2007). Dinámica de la concepción y la enseñanza de la teoría contable en Colombia (1970-2000): una exploración institucional. Bogota: Universidad Nacional de Colombia. [Links]

González, L., Adúriz- Bravo, A., & Meinardi, E. (2005). El modelo cognitivo de ciencia y los obstáculos en el aprendizaje de la evolución biológica. Enseñanza de las ciencias, (extra) 1-6. [Links]

Honn, D. D., & Ugrin, J. C. (2012). The effects of cognitive misfit on students' accounting task performance. Issues in Accounting Education, 27(4), 979-998 . [Links]

Izquierdo- Aymerich, M., & Adúriz- Bravo, A. (2003). Epistemological foundations of school science. Science and education, 12(1), 27-43. [Links]

Izquierdo- Aymerich, M., & Adúriz- Bravo, A. (2005). Los modelos teóricos para la enseñanza de la ciencia escolar: Un ejemplo de química. Enseñanza de las ciencias, extra 0001-4. [Links]

Jones, S. H., & Wright, M. (2011). Effect of cognitive style on performance in introductory financial accounting and the decision to major in accounting. Global Perspectives on Accounting Education 8, 7-26. [Links]

Keneley, M., & Jackling, B. (2011). The acquisition of generic skills of culturally-diverse student cohorts. Accounting Education: An International Journal, 20(6), 605-623. [Links]

León-Paime, E. F. (2009). La educación contable en el contexto anglosajón: Una mirada a los años de construcción de comunidad. Cuadernos de contabilidad, 10(27), 219-145. [Links]

León-Paime, E. F. (2011). Ser y comprender al docente contable: exploraciones autoetnográficas. Cuadernos de contabilidad, 12(30), 179-210. [Links]

León-Paime, E. F. (2013). La práctica docente en contabilidad de gestión; una aproximación a partir de las trayectorias. Cuadernos de contabilidad, 14(35), 617-637. [Links]

Loaiza, F. (2009). Aportes para la comprensión dle discurso pedagógico contable. Lúmina 10, 142-160. [Links]

Loaiza, F. (2011). Producción académica sobre educación contable en Colombia 2000-2009: incidencia de la pedagogía crítica. Lumina 12, 172-194. [Links]

Machado, M. A. (2009). Crisis de la contabilidad: contexto y dimensiones. Lúmina 10, 161-174. [Links]

Martinez, G. L. (2002). El rediseño curricular contable. Entre lo profesional y lo disciplinal. En Del hacer al saber. realidades y perspectivas de la educación contable en Colombia. Popayán: Universidad del Cauca. [Links]

Phillips, F., Alford, S. J., & Guina, S. (2012). Illustrations in financial accounting textbooks: Function and placement interact to affect student learning. Issues in Accounting Education, 27(4), 999-1017. [Links]

Ravenscroft, S. P., Waymire, T. R., & West, T. D. (2012). Accounting students' metacognition: The association of performance, calibration error, and mindset. Issues in Accounting Education, 27(3), 707-732. [Links]

Rengifo, C. A. (2012). La relación entre ciencia y filosofía a la luz del programa naturalista: Quine, Khun y Giere. Armenia: Universidad La Gran Colombia. [Links]

Rojas, W. (2002). La educación contable: al servicio de la afraternidad económica moderna. En Del hacer al saber: realidades y perspectivas de la educación contable en Colombia. Popayan: Universidad del Cauca. [Links]

Rojas, W. (2006). Constribución de las ciencias sociales y humanas a la Formacion del Contador Público. IV foro nacional de educación contable, Manizales, Colombia. [Links]

Sánchez, W. A. (2011). La docencia en el lugar equivocado. Lumina 12, 240 - 259. [Links]

Seifried, J. (2012). Teachers' pedagogical beliefs at commercial schools An empirical study in Germany. Accounting Education: An International Journal, 21(5), 489-514. [Links]

Selter, J. C. (2001). La aplicación de una didáctica creativa en la enseñanza de contabilidad. Fuentes, 03, 87-106. [Links]

Simkin, M. G., Keuchler, W. E., Savage, A., & Stiver, D. (2011). Why use multiple- choice questions on accounting certification examinations? Global Perspective on Accounting Education 8, 27-46. [Links]

Sin, S., Reid, A., & Jones, A. (2012). An exploration of students' conceptions of accounting work. Accounting Education: An International Journal, 21(4), 323-340. [Links]

Skliar, C. (2002). Alteridades y pedagogías: O... ¿Y si el otro no estuviera ahí? Educação & Sociedade 79, 85-123. [Links]

Stevens, R. E., Clow, K. E., McConkey, C. W., & Silver, L. S. (2010). Differences in accounting and marketing professors' criteria for textbook adoptions and preferred communications methods. The Accounting Educators' Journal 20, 33-45. [Links]

Strauss, A., & Corbin, J. (2012). Bases de la investigación cualitativa: Técnicas y procedimientos para desarrollar la teoría fundamentada. (E. Zimmerman, Trad.) Medellin, Universidad de Antioquia. [Links]

Sugahara, S., & Boland, G. (2010). The role of cultural factors in the learning style preferences of accounting students: A comparative study between Japan and Australia. Accounting Education: An International Journal, 19(3), 235-255. [Links]

Tamayo, O. E., Sánchez, C. A., & Buriticá, O. C. (2010). Concepciones de naturaleza de la ciencia en profesores de educación básica. Revista Latinoamericana de Estudios Educativos, 6(1), 133-169. [Links]

Tamayo, O. E., Lopez, J. R., & Loaiza , Y. E. (2014). El pensamiento crítico en el aula de ciencias. Manizales: Universidad de Caldas. [Links]

Tamayo, ó. E., & Orrego, M. (2005). Aportes de la naturaleza de la ciencia y del contenido pedagógico del conocimiento para el campo conceptual de la educación en ciencias. Educación y pedagogía, XVII(43), 13-25. [Links]

Tegarden, D. P., Sheetz, S. D., & Henderson, D. (2010). Strategic planning in an accounting department using causal maps and cognotive factions. Accounting Education: An International Journal, 19(5), 473-500. [Links]

Thibodeau, J. C., Levy, E., & Osterheld, K. K. (2012). A supplementary evening program for students in the introductory financial accounting course. Advances in Accounting Education 13, 23-40. [Links]

Triki, A., Nicholls, S., Wegener, M., Bay, D., & Cook, G. L. (2012). Anti-intellectualism, tolerance for ambiguity and locus of control: Impact on performance in accounting education. Advances in Accounting Education 13, 87-107. [Links]

Vera, A. (2012). Una teoría fundamentada en el meta-análisis de datos neurocientificos sobre el papel de la metacognición en el aprendizaje. Manizales: Universidad Autonoma de Manizales. [Links]

Zambrano, J. A. (2012). La enseñanza de la contabilidad en los libros de textos universitarios:"Actividades, funciones, dispositivos didácticos y teoría contable (1960-2008)". Ibague: Universidad del Tolima. [Links]