



Problem-Based Learning for Accounting Courses: Evidence from Brazil

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Resumo

Problem-Based Learning is a didactic methodology that prioritizes active student participation. The aim of this research is to identify the challenges and opportunities that the PBL methodology presents when used in undergraduate Accounting courses. This research intends to respond to the following question: What does research indicate as (dis)advantages of using PBL in Accounting undergraduate courses? To respond to this question, the research was performed in two stages: the first was a bibliometric analysis about PBL in undergraduate Accounting courses in the international and Brazilian contexts; the second stage was a series of interviews with researchers into the area of PBL applied to Accounting Education, with the objective to confront their views and experiences with those indicated by the findings of the bibliometric analysis. The results for this study showed that there is generally a good reception to the method by students and that the method effectively develops communication skills, teamwork and problem solving, which agrees with previous research. It was also possible to identify that the use of PBL is still an emerging theme in Accounting courses and that when it does occur, it is through isolated initiatives of researchers interested in the subject.

Palavras-chave: Problem-Based Learning. Undergraduate Accounting Courses. Bibliometric research. Review Paper.

1 Introduction

Problem-Based Learning (PBL) is a pedagogical approach based on constructivism where real problems are used in conjunction with a learning environment in which research activities, self-directed learning, information extraction, dialogue and collaborative problem solving are incorporated.

Stanley and Marsden (2012) indicate that PBL emerged in the area of medical education in Canada and the United States in the 1950s and 1960s. Currently PBL has been adopted



successfully in the areas of nursing, engineering, social work, law, business administration and economics.

The objective of this research is to identify the advantages and disadvantages of using PBL in Accounting undergraduate courses. To achieve this, the study seeks to answer the following question: What does research indicate as (dis)advantages of using PBL in Accounting undergraduate courses?

The rationale for this research is the need to identify new teaching methodologies that facilitate the formation of an accountant who meets the profile demanded by today's profession: broad business knowledge, communication skills and an understanding of the company as a complex and dynamic system.

2 Methodology

The methodology of this research is divided in two stages: a bibliometric analysis and a series of interviews.

2.1 Bibliometric phase

The bibliometric research stage, in turn, was divided into two phases: the international and Brazilian contexts. The international context research phase was directed through the use of the Scopus database limited to the period from 1900 to 2013.

The Brazilian context research phase was initially driven by the criteria used in Eloy Jr., Soares e Casagrande (2013) and Duarte et al. (2013), which was set by Brazilian scientific journals maintained/related to graduate studies in Accounting programs in Brazil, totaling 15 journals. However, this research extended the search to the following criteria aiming to cover a larger volume of scientific communication media:

- Journals maintained by professional bodies or associations such as *Conselhos Regionais de Contabilidade*, *Conselho Federal de Contabilidade*, *Associação Brasileira de Custos* and *Associação Nacional de Programas de Pós-graduação em Ciências Contábeis* [6 journals];
- Journals maintained/related to higher education institutions offering Accounting undergraduate courses [16 journals];
- Scientific Periodicals Electronic Library – SPELL, a database maintained by the Brazilian Business Administration Graduate Programs Association (ANPAD) [76 journals];
- Google Scholar search system.

The keywords utilized in the searches in the databases were: “*problem-based learning*”, “*aprendizagem baseada em problemas*”, “PBL”, “ABP”, “*accounting*”, “*contabilidade*”, “*ciências contábeis*”.

2.2 Interview stage

After analyzing the set of articles selected in the bibliometric stage, we chose a group of researchers, including some authors of the articles identified in the bibliometric stage, and invited them to participate in semi-structured interviews.



The guide used in the interview was based on the literature review and contact that was made with other researchers who have used the interview as a data collection tool.

The eight questions in the interview guide were:

1. Where did the interest in PBL emerge? (ie. contact, training, etc)
2. Why should PBL be applied in Accounting?
3. Which are the largest difficulties in its implementation? (From students, institution, etc)
4. From the point of view of the professor, which are the major demands for those who adopt PBL?
5. Is PBL better adapted for generic or specialized content?
6. Is PBL better adapted for the social or exact sciences?
7. Which are there specific problems in the application of PBL in Accounting?
8. What are your expectations in the long term? (In terms of PBL in Accounting)

3 Literature Review

In this paper, we chose to perform a structured literature review. The search for articles in the Scopus database was refined by scientific articles published in scientific journals in the area of business. This search resulted in six articles published between 1998 and 2013. Table 1 shows the search results:

Table 1 – Articles found in Scopus

| Articles |
|--|
| Johnstone, K. M., & Biggs, S. F. (1998). Problem-based learning: introduction, analysis, and accounting curricula implications. <i>Journal of Accounting Education</i> , 16(3), 407-427. |
| Dee, C. C., & Durtschi, C. (2010). Return of the Tallahassee Bean Counters: A case in forensic accounting. <i>Issues in Accounting Education</i> , 25(2), 279-321. |
| Cottell Jr, P. G. (2010). Shreffler stores accounting issues related to consumer receivables, asset impairment, and discontinued operations: A problem-based learning unfolding problem. <i>Issues in Accounting Education</i> , 25(4), 775-787. |
| Lehmann, C. M. (2010). Internal controls: A compendium of short cases. <i>Issues in Accounting Education</i> , 25(4), 741-754. |
| Stanley, T., & Marsden, S. (2012). Problem-based learning: Does accounting education need it?. <i>Journal of Accounting Education</i> , 30 (3-4) , pp. 267-289 |
| Stanley, T., & Marsden, S. (2013). Accountancy capstone: Enhancing integration and professional identity. <i>Journal of Accounting Education</i> , 31(4), 363-382. |

The Brazilian bibliometric analysis took into account the journals that fit into certain criteria: i. were maintained by *strict sensu* graduate programs (e.g. PhD and Academic Master Programs) in Accounting in Brazil (15 journals), ii. were maintained by Accounting higher education institutions in Brazil (without graduate programs) (16 journals), iii. were held by the accounting professional boards or associations (6 journals).

In total, 37 peer-reviewed journals from 1989 (the oldest), until the year 2012 (List of journals in Appendix 1) were included in the research. Using this search criteria, we identified 3 articles that mention PBL in Accounting, which are shown in table 2:



Table 2 – Articles found in Brazil

References

- Vasconcelos, A. L. F. S., Silva, M. F. N., Lima, C. A. & Melo, E. A. T. (2007). Uma reflexão da aprendizagem cooperativa como estratégia de ensino para a formação dos contadores [A reflection about the use of collaborative learning as a teaching strategy for accounting professionals education]. *Revista de Informação Contábil*, 1(2), 72-83.
- Siqueira, J. R. M., Batista, R. S., Morch, R. B., & Batista, R. S. (2009). Aprendizagem baseada em problemas: o que os médicos podem ensinar aos contadores [Problem based Learning: what medical doctors can teach to accountants]. *Contabilidade Vista & Revista*, 20(3), 101-125.
- Pinheiro, M. M., Sarrico, C. S., & Santiago, R. A. (2011). Como os acadêmicos se adaptam a um ensino baseado em PBL numa licenciatura tradicional em contabilidade [How did the academicians adapt themselves to a problem based learning context in a traditional undergraduate program]. *Revista de Contabilidade e Organizações*, 5(13), 109-131.
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Although the research of Pinheiro, Sarrico and Santiago (2011) deals with the use of PBL and has been published in one of the journals in the sample, it was carried out in a Portuguese institution: the Institute of Accounting and Administration of the University of Aveiro - ISCA-UA, and therefore their findings can not be admitted as originating from Brazil.

The resulting set of articles on PBL in Accounting in Brazil surprised the authors of this research: we expected to find a larger number of studies. However, there is a possible explanation for this. Cruz et al. (2011) found that only 15% of articles published in the University of Sao Paulo (USP) Conference of Controllershship and Accounting between 2001-2010 became definitive publications (i.e., were published in journals). Eloy Jr., Soares and Casagrande (2013) and Duarte et al. (2013), considering the findings of Cruz et al. (2011), extended their analysis to academic events and congress.

These events, though ordinarily used to present working papers of academic research, can also contribute more information to allow better localization of Brazilian researchers studying the use of PBL in Accounting. Therefore, the authors of this paper chose to also use the most popular search engine among undergraduate and graduate students: Google Scholar.

The initial search revealed 62 results. Of these, two were eliminated because the file was missing, four were broken links, six were not research, e.g. policy-pedagogical projects or course catalogs, three were duplicated results (file versions in conferences and journals), 32 did not deal with PBL (only mentioning the theme throughout the text), nine did not relate to Accounting Education, e.g. nursing or chemistry, and had been identified as the research of Siqueira et al. (2009) (Table 3).

The 5 research papers found were:

Table 3 – Articles found using the key-words in Google Scholar

References

- Lobosco, I. F. (2007). Caso-problema no ensino de contabilidade introdutória: um estudo da percepção dos alunos do curso de graduação quanto à sua aplicabilidade no desenvolvimento de competências e habilidades [Case problem in introductory accounting teaching: undergraduate students' perceptions of its applicablity in the competences and abilities development. Dissertação de mestrado, Fundação Escola de Comércio Álvares Penteado.
- Rodrigues, E. D. A., & de Araújo, A. M. P. (2007). O ensino da contabilidade: aplicação do
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método PBL nas disciplinas de contabilidade em uma Instituição de Ensino Superior particular [Accounting Education: the use of PBL in accounting courses in a Private Higher Education Institution]. *Revista de Educação*, 10 (10), 166-176

Soares, M. A., & Araújo, A. M. P. D. (2008). Aplicação do método de ensino problem based learning (PBL) no curso de ciências contábeis: um estudo empírico Use of PBL in accounting courses: a empirical study]. In *Congresso Da Associação Nacional Dos Programas De Pós-Graduação Em Ciências Contábeis*, 2. Salvador: ANPCONT.

Benjamim Junior, V. (2011). Teoria da complexidade e contabilidade: estudo da utilização da aprendizagem baseada em problemas como abordagem complexa no ensino de contabilidade [Theory of Complexity: study of the use of PBL as a complex approach in the accounting education]. Dissertação de mestrado, Faculdade de Economia, Administração e Contabilidade, Universidade de São Paulo.

Frezatti, F., & Silva, S. C. (2012) Prática versus Incerteza: Como gerenciar o aluno nessa tensão na implementação de disciplina sob o prisma do método PBL? [Practical experience versus uncertainty: how to manage this stress and tension in a course through the prism of the PBL method]. In: *Congresso USP de Controladoria e Contabilidade*, 12. São Paulo: FEA/USP.

Note that the papers by Lobosco (2007) and Benjamin Junior (2011) were both Master's thesis. Soares and Araujo (2008) and Benjamin Jr. (2011) were conference presentations. Only the research of Araujo and Rodrigues (2008) was published in a journal.

3.1 Research about PBL in the International context

Research into the implementation of Problem-Based Learning methodology in Accounting education have been receiving more attention in recent decades. As the role of accountants are evolving, impacted by adaption of modern technology, so were the professional demands which improved the Accounting education curriculums.

In the paper "Problem-Based Learning: Introduction, Analysis, and Accounting Curricula Implications", Johnstone and Biggs (1998) proposed various strategies for the implementation of Reiterative problem-based methods in 150-hour undergraduate accounting programs. They argued that including PBL throughout the curriculum encourages knowledge encapsulation, which ultimately supports in the development of accounting expertise. The authors identified the four main characteristics of PBL as the basic technical knowledge taught in the context of realistic cases, the general problem-solving skills that were specifically taught, and the emphasis on small-group and student-centered learning. They also discussed the advantages of each of these characteristics and suggested implementation strategies to mitigate the disadvantages. It was emphasized that PBL is best implemented only after students possessing a basic knowledge of accounting and the importance of tutors' expertise in the area was also stressed. Due to the varied nature of PBL implementation, each institution would have to identify and clarify their learning objectives and implementation standards.

Cottell (2010) described his experience using the Shreffler Stores PBL unfolding problem, which provides students with vague, unstructured problems. The problem "unfolds" as the students are given more information in later phases, with each having different learning objectives. The author used "PBL Worksheets" to collect qualitative students feedback on achieving key learning objectives and gauging team collaboration. Cottell also used a five-point Likert questionnaire to measure student opinion about the use of the Shreffler Stores unfolding



problem, where the majority of students expressed an overall “enjoyable and meaningful experience.” (p. 785)

In the paper “Internal Controls: A Compendium of Short Cases”, Lehmann (2010) also presented several short, unstructured, and open-ended PBL cases in the context of auditing and internal control systems. In a similar manner, the cases were short enough to cover specific learning objectives and often applied in small group environments throughout the course. In contrast to Johnstone and Biggs’ implementation strategy, Lehmann (2010) found that the cases were more effective when implemented before the lecture-based portion of the class, as a form of “trigger cases” to stimulate interest in the topics, yet the author cites that the cases have also been successfully used as a form of final evaluation at the graduate-level. Student reaction to those cases remained positive overall and working in teams and understanding the textbook material were also perceived as enjoyable experiences.

Dee and Durtschi’s (2010) PBL case focused on fraud detection in auditing curriculum through a fictitious minor league baseball team called the Tallahassee Bean Counters (TBC). Several characteristics of the TBC case problem differentiate it from the aforementioned PBL cases. TBC cases were implemented in a directly competitive environment where teams are incentivized to compete against each other. Furthermore, the fraud detection context of the TBC case involves the active development of critical interrogation skills of live suspects rather than more data collection. The authors discussed several strategies for managing the instructor workload, including limiting the amount of time in which the students worked on each case, assigning a graduate assistant to answer questions, and imposing a penalty on team scores if they make too many inquiries. The TBC case problem has been used in nine universities throughout the US and overall student feedback has been “very positive” and viewed a “rewarding learning experience” based on 81 student surveys with responses on a seven-point scale. Similar to the above research papers, findings indicated that students really enjoyed the active engagement and the development of a variety of skills. The classes that incorporated suspect interrogations showed significantly more positive responses throughout the survey compared to student responses from classes that didn’t use suspect interviews. Teacher response also seemed to be positive, based on instructor comments and the continued use of the TBC case problem throughout the semesters, however no formal survey method was used.

Stanley and Marsden (2012) explored student perceptions of their PBL experience in the research paper “Problem-Based Learning: Does Accounting Need it?” This paper studied seven different cohorts of undergraduate accounting students in their final year over a four-year period at Queensland University of Technology (QUT) in Australia. Data was collected through 481 survey responses including qualitative data extracted from student comments. Both quantitative and qualitative data obtained from the student surveys across the four years indicated a very successful implementation of PBL in the accounting curriculum. The results further indicated that PBL is generally effective in developing the areas of interrogation, teamwork, and problem solving.

In a subsequent paper “Accounting capstone: Enhancing integration and professional identity”, Stanley and Marsden (2012) added two more cohorts of survey data to their previous study and sought to analyze the class in the context of a capstone course, where curriculum is designed to “integrate the program and bring closure to the undergraduate experience; provide students with an opportunity to reflect on prior learning and the program as a whole; and to prepare students for the transition into the professional workplace.” (p. 365) The most recent paper involved analyzing beyond the development of professional skills to focus on the



program's integration and enhancement of professional identities among students. Both quantitative and qualitative data were again extracted from the survey responses and analyzed in a manner similar to the 2012 author's paper. Their analysis suggested that the capstone unit successfully integrates and reviews the material from previous semesters in real world context and that the unit was also effective in reinforcing the transition to work and the professional identity.

3.2 Brazilian research

Although the use of PBL is a known occurrence in international Accounting courses, a more detailed account of PBL is necessary in Brazil due to the historical and normative characteristics of the course, as presented by Peleias et al. (2007), Soares & Pfitscher (2012), Soares et al. (2012a), Soares et al. (2012b) and Marroni, Rodrigues & Panosso (2013).

Rodrigues and Araujo (2007) proposed to respond to the following: is the PBL method applicable to Accounting courses? In light of this question, the authors developed a number of hypotheses that were analyzed by using a survey administered to two groups of second and third years students, consisting of 30 and 46 individuals, respectively, from a private university in the state of São Paulo. The authors found that, in general, students perceive PBL as an opportunity to change the routine of the classes, explored the resources provided by the institution and felt free to decide on the activities developed in the classroom, in self-learning a process. The authors pointed out that some needs were identified: i. to acquire publications for the library on the side of Higher Education Institutions (HEI), ii. larger class rooms because current facilities could not accommodate a meeting with all the groups at once, iii. more double sessions than previously anticipated because the students had to carry out the activities in the classroom, since many students were already working, and iv. teachers to administer classes on the preparation of academic work, including citations and references. The authors list that the main obstacles presented by the students were: i. difficulty of the students in their first contact with the PBL method, ii. resistance from students who rejected the method, iii. lack of student experience in having seminars, iv. lack of student experience in developing research.

Finally, the authors concluded that the PBL is applicable to Accounting although noting that its applicability needs to be analyzed, contrasting the content to be covered and that any contingent adjustments should be more related to the students' profile than the complexity of the content. The authors also indicated that learning through PBL is apparently more consistent and long-lasting and that the main difficulty in the application of the PBL method was the limitations of the students in problem definition and presentation of final results, rather than problems between group members. Araujo and Rodrigues (2007) also claimed that most students appreciated the dynamics of PBL method by spontaneously expressing satisfaction to the teacher on several occasions. However, this did not prevent overall hostility to the method as a student questioned when the "teacher would teach."

Lobosco (2007) developed a survey that compares PBL with traditional learning in three groups of two educational institutions. Lobosco's research was conducted in two stages: a survey and an experiment. The survey, conducted in 2006 with 105 students, analyzed the preference of the student by type of school. The experiment, conducted with 78 students, was used to analyze the efficiency of the case as a teaching methodology. The author concluded that the student understands the traditional classroom as a teaching process that does not allow him/her to implement the acquired knowledge in a real life situation. And thus students disagreed with the



occurrence of effective learning and recognized that repetitive exercises and situations involving the study of the text and solving real problems as a more enjoyable class.

In fact, among the students entering the Accounting course between 2006 and 2007, with whom Lobosco's research was conducted, approximately 61% of students were between 18 and 33 years old, thus being born in the 1970s and 1980s, and therefore belong to the so-called Generation Y, also known as "Millennials" or generation "Internet". Sociology studies indicate that one of the characteristics of this generation is the need of individuals to feel constantly challenged and one of the features of PBL is that it often represents a more challenging learning method students than the traditional lecture.

Vasconcelos, Silva, Lima & Melo (2007), presented a theoretical discussion of how collaborative learning methodologies, focusing on problems, can contribute to the development of the professional accountants that the current professional market actually seeks. The authors stated that due to changes in the market, companies tend to demand more dynamic professionals, tailored to teamwork. Collaborative learning can indeed better prepare accountants to meet this demand.

Soares and Araujo (2008) conducted a survey which used various research tools and analysis techniques: observation, interviews, document analysis, Likert scale surveys with reliability analysis, validity and regression. The survey was conducted with a class of 48 students of Introductory Accounting II, in the Accounting course at the University of São Paulo – Ribeirão Preto (Brazil), in which 40 students participated. This sample may also be considered adolescent and belonging to Generation Y, as in the Lobosco (2007) study. In the research, published in 2008, 97.5% of students were under 30 years old. The quantitative analysis found that exposure to PBL allowed students to gain more knowledge in the area, acquire the problem-solving ability, improve communication skills and developing general skills as well as gaining self-confidence. These results are consistent with previous investigations, including other professional areas such as medicine.

However, it should be mentioned that the qualitative analysis showed there were also negative reactions to the method, as demonstrated by one student response that: "Some liked the practical method, since I prefer the explanation of the teacher with his slides and lectures" (Respondent 29). The authors interpreted this fact as natural, because even within a group of many students is almost impossible to find a statistically homogeneous group regarding learning styles.

Siqueira, Siqueira-Batista, Morch & Siqueira-Batista (2009) held two tutorial case-problem sessions with 15 undergraduate volunteer-students in the undergraduate Cost Accounting II course in a public HEI. The authors utilized observation and semi-structured interviews as data-collection tools and used content analysis for the interview transcriptions. Regarding the applicability of PBL in Accounting, seven students considered that it applies without restrictions, four thought it is applicable to materials with greater conceptual approach, three responded that it should be combined with traditional lessons and one suggested it was applicable with adjustments in the evaluation process. One student claimed that the method was applicable: "[...] somehow yes. I can't see financial mathematics using that method. But in business management area surely without a doubt." (p. 112). The study showed that there were gains in communication skills, research abilities, competitiveness and even controlling timidity. On the other hand, students also believe there is a risk of incomplete learning and that the method may not be applicable to all subjects. Two interesting points of the authors' conclusion was that 12 of 15 students perceived PBL as more dynamic than the traditional method, and that 14 of 15



students realized that PBL allows for greater autonomy than traditional learning. The authors analyzed the applicability of the method to the Federal HEI and at this point only one student considered that the method was applicable without restrictions while four considered it was not applicable, two responded that it was applicable with student-turnover in classes, two with classes of fewer students, and 5 with other restrictions (gradual adoption of PBL, use in elective courses, use a reduced workload, with the support of additional investments and through extra courses).

Benjamin Jr. (2011) developed a quasi-experiment in two stages with students of an undergraduate accounting course: in the first stage, the experimental group was exposed to PBL and the control group was not, in the second stage, exposure to PBL was reversed between groups. The quasi-experiment was conducted between March and June 2011. Each group was composed of 22 students, in which 74% and 75% of students were less than 30 years old. The results showed that the students exposed to PBL enjoyed greater gains in autonomy, problem-solving and learning skills, than students exposed to traditional lectures. However, the author indicated that PBL should not be considered as a substitute of traditional methodologies but rather as a powerful complement.

4 Interview Analysis

Two interviews were performed with PBL researchers. The table below summarizes some characteristics of each researcher, which were essential to the decision of interviewing those researchers, and the characteristics of how the interviews were conducted.

Table 4 – Interviewee's Profile

| Interviewee | Interview |
|---|--|
| Interviewee 1, PhD., Professor at the Singapore Institute of Management | Interview conducted face-to-face in São Paulo on December 4 th , 2013, 63 minutes, transcription in 12 pages, in English. |
| Interviewee 2, Full Professor at the University of São Paulo – São Paulo (Brazil) | Interview performed via Skype, on December 16 th , 2013, 68 minutes, transcription in 19 pages, in Portuguese. |

Considering ethical aspects of research with humans, two documents were adopted. The first was an Informed Consent Form, composed of two clauses: 1. the content of the interview will not be attributed to any of the interviewees and 2. the identity of the interviewees will not be revealed in the research.

4.1 Where did the interest in PBL arise? (e.g. contact, training, etc.)

The interest in PBL had diverse origins among the respondents: ranging from academic background and environmental influence (Interviewee 1), to teaching experience (Interviewee 2):

I happened to be teaching in a Problem-Based Learning environment. So that was my first introduction to Problem-Based Learning. And as a requirement, before I could teach, I had to go through a mandatory training of how to facilitate in Problem-Based Learning and what is Problem-Based Learning. So when I got to learn more and more, I became interested. (Interviewee 1)

Interviewee 2 stated that after using other alternatives such as active learning and simulation cases, learned about PBL and decided to adopt it:



[...] firstly, I have been using active teaching techniques [...] I have been using case method for many years and then it somehow is working in my classes [...] I am tired of using simulation and cases. (Interviewee 2)

4.2 Why study PBL in Accounting?

Interviewee 1 discussed how PBL methods can help to develop the skills that the current professional market desires of modern accountants:

[...] the outcomes that we want of accountants [...] in the 21st century, is not just to work as a solo accountant; we want them to work in teams, across nations, and we want them to put together different sets of data and analyze. Even in some instances, we want them to be able face situations that they have not experienced before. So complex situations and how to break down and how to work that situation; this kind of training is provided by technology of educational methodology like Problem-Based Learning. (Interviewee 1)

Interviewee 2 stresses the need for practical application in Accounting courses.

[...] the main critic students make is that they want a practice-based discipline [...] It is an evolution through time and I believe it is more adequate to Accounting. (Interviewee 2)

4.3 Which are the largest difficulties of PBL implementation? (From students, institution, etc.)

Interviewee 1 discussed how the increasing variation in implementing PBL is starting to distort the original PBL methodology, which results in strategies that cannot be ultimately considered PBL:

I think that the variations, while it is good, has also lead to misunderstanding and people change the PBL format so much so that it's no longer PBL. (Interviewee 1)

Interviewee 2 lists four main types of problems. The first is the lack of students' awareness about PBL's potential or even disagreement with the adoption its method, due to various causes, partly because the method requires an active participation of the student, and thus more effort:

[...] it does not mean that something you think is good for the students, may will seen as a gift. Why? Because he will have an increased workload. (Interviewee 2)

In relation to students, Interviewees 1 and 2 shared the view that students are resistant to the extra work that PBL requires. Interviewee 1 also believes that students are not fully prepared to work in a PBL environment. Whereas the traditional teaching methodology emphasizes competition among students for better grades, PBL is very dependent on collaboration and teamwork, and students may thus not know how to perform these conditions:

[...] as of today, I think that students are not so experienced in PBL, so they are quite resistant. Students that come in, they are expecting the teachers to provide the information and they do not know how to function in a team. There are a lot of restrictions like they don't want to share materials, they want to keep the materials for themselves because they want to get the better grades. (Interviewee 1)



Interviewee 2 asserts that the amount of effort expended is not only related to the students but also to the instructors, who tend to have a much more work than if they had adopted traditional methodologies, such as lectures.

[...] Second, you will need infrastructure. Only one instructor teaching a PBL based course is complicated. I will explain as: it is not impossible but the quality loss is absurd. You can't deal with 40 students on your own. [...] (Interviewee 2)

Anastasiou and Alves (2003) and Soares and Araujo (2008) stated that it is difficult for instructors to adopt different teaching strategies as there is a culture that is dominated by the use of lectures and content exposure. Interviewee 2 also lists two difficulties: one faced on the basis of an administrative-curricular issue and the other sociological:

The third problem that we will try solve is the time-extension. [...] PBL generates some tensions. (Interviewee 2)

The temporal extension mentioned by the interviewee is important because its audience is comprised predominantly by evening class students in a 4-credit course. Evening class students tend to work during the day, so activities requested in the discipline tend to compete with the students' scarce free time and it thus becomes necessary to develop more work during the class, which of course requires more time. The traditional course of 4 hours per week has 8 credits at this institution.

The last sentence posed by Interviewee 2 also indicates concerns about the frictions that occur during the interaction of students in a group where each has well-defined role (leader, secretary, etc.).

Along the same line, Interviewee 1 discusses the criticism of PBL from the point of view of the instructor. Teachers may feel uncomfortable about losing their dominance of classroom and criticize PBL's inefficient use of class time over traditional methods of lecture:

[...] for teachers, I think that it is very difficult for some teachers to give up the lime light and let the students take the ownership of learning. It's a bit drama to go in front of the stage, some people enjoy that really, so they don't really want to give that freedom away to the students. And they think that this is a very efficient way; traditional teaching, "I can cover all this material in this many hours."

And

Also, sometimes people question the validity of PBL or the usefulness of PBL. They think that it is good for soft skills, but not for content. A common complaint is that "Oh PBL, it is fun but does a student learn? We spend one whole day but they don't remember anything or they don't learn as much as they would have if they had attended a lecture." They want to compare it in that way. (Interviewee 1)

4.4 From the point of view of the professor, what are the main demands for those who adopt PBL?

Since students need to assume a more active role in the PBL scenario, Interviewee 1 emphasizes the need for the instructor to reinforce the behavior of collaborative learning among students in adapting to the new learning environment.

The role of students changed, the role of tutors changed. In any environment, be it in a teaching environment or be it in a work environment, I think people work towards achieving what is rewarded and work away from things that is being punished. So if you reward teamwork, in time to come, they will get better at teamwork. The thing is that when they first come in, they are not prepared for it and they go through a lot of struggle the first year usually. So we really need to support them in training, maybe orientation,



giving them resource materials (on) what is Problem-Based Learning, what is expected of them. (Interviewee 1)

Similarly, another demand for instructors in PBL is preparing students to work in teams and to break away from the traditional mindset of purely individual effort and performance:

When they come in, working in teams, research skills is very bad [...] They don't know how to ask questions. But with time, they get better and better and they start challenging each other (and) the teams with stronger questions, more critical questions. The competition now is not about hoarding information, but the competition now is about who understands information better and who can present it better. (Interviewee 1)

However, the principle demand in the implementation of PBL is the large investment of time required of students:

When you're listening to a lecture, maybe at best, you read up before the lecture. But the main process is listening. In PBL, that process is multiple steps: you need to understand the problem, you need to analyze the problem, you need to do research, you need to put it together, (and) you need to discuss with the team. [...] So it's a multi-step process and logically it will require more time. (Interviewee 1)

The Interviewee 2, in turn, points out two major demands of the teachers that choose to adopt PBL in the classroom:

We will need more feedback [...] before starting the course we usually send a questionnaire. With this questionnaire [answers] we already give an initial feedback to the students.[...] (Interviewee 2)

And

[...] we already have a set of five, six slides during the course. This means that in five times we will have lectures. When we give feedback and realize that students did not understand that slide returns. (Interviewee 2)

In other words, Interviewee 2 focuses on the intense requirement to monitor students' understanding, reviewing content when it's perceived that students have not seized the subject matter and also the constant need to give feedback and inform the student of their performance at that time.

4.5 Is PBL better suited for generic or specialized content?

According to Interviewee 1, the answer to this question depends upon the students, the teacher and the context in which PBL is implemented:

It is possible to have PBL and have surface learning. It is also possible to have PBL, the same class, and the students having deep learning. So what differs here is not the classrooms and things, it's not the tutor, one reason can be how the students are in the first place. So that is one issue. Another issue could be the tutor. You can have the same problem (in) different classrooms, so different tutors, and one teacher is able to drive better learning than another. That is to do with facilitation skills. So it's not a simple yes or no answer, it's very multi-faceted; a lot of factors into play. (Interviewee 1)

However, PBL may have some advantages in terms of applying the content:

While research actually shows that (PBL) is much better than traditional teaching in terms of application of knowledge. Same level for theory and better in terms of application. (Interviewee 1)



Interviewee 2 has the following opinion about the appropriateness of the use of PBL to generic or specialized content:

[...] I think that managerial disciplines are more [...] adjusted or prepared to this. [...] But what is the question? [...] is the discipline customization to the area. It has to be done by someone who understands the area [...] Now, this can be also considered by the financial accounting point of view? For sure it can. Someone asks me how IFRS has been implemented? How they are doing or treating the tax planning aspect? You do have many possibilities [...] But my impression is that managerial accounting disciplines are easier. Why? You can customize more some questions. (Interviewee 2)

It may be noted that the respondent sees no restrictions on the type of content within the curriculum of Accounting.

4.6 Is PBL better suited for the social or exact sciences?

For Interviewee 1, the PBL has the ability to be implemented in any area that requires the application of knowledge in a real life context. It also depends on the knowledge and creativity of the teacher who wishes to use PBL in the classroom:

Tell me which discipline does not have a problem. Which discipline does not have a real life context? So which discipline is (then) not suitable for Problem-Based Learning? Which discipline, which profession, requires one to work on his/her own all the time? I think it is possible to apply, it is only in creatively thinking how we can. [...] If you understand the subject, if you love the subject so much, then you would know how to construct the problem; how to design the design the entire process. [...] It's really your creativity and a person who has a passion for the particular field, who has an in-depth content knowledge, they will know how to. (Interviewee 1)

When asked about the appropriateness of the use of PBL in human and exact sciences, an important point can be found in Interviewee 2's response:

[...] when you are teaching how, using financial math, I am sure you can use PBL. If you consider a problem related to, I don't know, payment default, or then, cost optimization, of financial cost regarding vehicles, you do create condition for having interesting problems, challenging ones [...] that somehow the student can look at [...] If you tell me that financial math discipline has only to teach formulas, I also can't see PBL implementation. Now, in the moment that you tell that not, wait, I want to see problems that financial math can collaborate to solve, then I have no doubt, that you can think about them. (Interviewee 2)

The emphasized element, according to Interviewee 2, is "applicability". The interviewee states that where there is the opportunity to create an environment for the application of knowledge, then there is also room for the use of PBL. On the other hand, the interviewee showed less enthusiasm about the use of PBL in courses involving the need for retaining or transfer of a more codified knowledge such as financial mathematics, where there are rules and it can simply be checked if the rules were applied correctly or not:

So when [name of the instructor] teaches you do know that using the compound interest formula applied gives a number. You know if it is right or wrong. [...] In Accounting we have some disciplines are like this, but this is not predominant. (Interviewee 2)

4.7 Are there specific problems in the application of PBL in Accounting?



In terms of learning objectives for a given activity, Interviewee 1 believes that PBL may not be suitable for the transmission of basic and uniform content:

It is just, I teach you this; you do this. You don't need to think much more than that. I think that is the concept of some teachers. You are taught this theory, so you say who came up with this and how to do this problem, how to compute this, like a formula-driven accounting question. I think then, PBL is not going to be suitable. It is not meant for that in the first place. I think it is really to explore beyond all these things and maybe even come up with your own theories or your own way of doing things, a different way of doing things, not just this one particular way. [...] it is more about not just regurgitating the information, but to some extent, even knowledge creation. You come up with a solution which may not exist today. You come up with a solution, a proposition, then evaluate if it will work, will it not work, that kind of situation. (Interviewee 1)

Likewise, the PBL can also be used as a motivational tool in which students can integrate the application of knowledge with the reasons and motivations of why they behave in a certain way, as Stanley and Marsden (2013) identified in the learning objectives of a course.

[...] if you are just asking students to work on balance sheets and be like "does it balance?" I mean, they will learn how to balance, they will know how to check, but they're not going to be passionate about it. I think one of the functions of educational institutions is not just to transmit and transfer the knowledge, it is really to empower, to inspire students to become the next generation in that field. (Interviewee 1)

Interviewee 2 does not mention any problems encountered by the application of PBL specifically in Accounting, but makes an exception:

[...] students bring to us problems that somehow make their lives more difficult. What is the challenge? It is make the student that is doing an accounting discipline don't look only to non-accounting related issues. (Interviewee 2)

4.8 What is your expectation in the long term? (In terms of PBL in Accounting)

Interviewee 1 states that the implementation of PBL in Brazil has the potential to be successful if implemented correctly:

[...] (the professors) considered various aspects and students have given positive feedback and it's worth trying out for a few more semesters before really concluding whether it works or doesn't work. I think it works. So far, from the result, it looks like the students were happy the way the course was run. [...] in the case of USP and the School of Economics, Business Administration and Accounting, it is initiated by few people. It is bottom-up, from individuals trying to establish PBL. So it's good in a way because these people are going to be very enthusiastic and will try their very best, will try to improve and try to make it work. (Interviewee 1)

Interviewee 1 believes that the diffusion method, with the adoption of teachers in their classrooms, would lead its global expansion across higher education in Brazil.

It is going to be a situation where one program, if it's run successfully, if it is evaluated, documented, shared with people, and marketed. So you spread the goodness of it; the news of it. Then it will spread; it will grow. So what will happen in the future, actually I don't know! But I think there are very enthusiastic people and generally the department seems to be supportive of the ideology and the methodology. So I have hopes that the PBL will be here to stay. (Interviewee 1)



Interviewee 2 expressed their opinion about their expectations for the long-term PBL to Accounting as follows:

Look [...] Yes, I don't see a large and rapid growth. [...] Because, for instance, [name omitted] did with me, but he is not using it.[...] He did the discipline, he participated, so we doubled the number of PBL adopters at FEA. It was only one and now you have two. [...] But, you see by the workshop¹. We will do workshops in the beginning of the year and our aim is attract attention. Why? Because we need more people to start a conversation [...] you have an important stimulus. I dream with things like those, asking a teacher to give feedback to other teachers[...] bring teachers to somehow participate in some portion [...] of the lecture and who knows may be we will be part of a team, but this is a complicated work. [...] What happens when you have an individual initiative, is that the institutionalization is much more complicated because either you persuade someone [...] or you will find someone [...] who has the profile. Who is in search of a discipline like that.[...] Or it will not happen. Soon I will be dead and the PBL died also at EAC. So. It is more or less what happened with Harvard [case method]. [...] The first [to use] was a business department female faculty, she went to Harvard, [name omitted]. After was [name omitted], and I was part of the first group. What means that I was the first accounting department faculty to go.[...] Together with [names omitted]. [...] Well. What did happen? After me eight or nine went. Ask them if they are using Harvard case method. Ask them! [...] Ask [names omitted] how many times they used it. Or you do have people that want to adopt that approach, the method, or it will happen, even if they have..... Imagine, I went to Harvard, you had a privileged training opportunity with people from all around the world. You have many allies to share information. [...] Now, if you don't have this, the minute I died, it is over also this because the secret is having colleagues that also want to do this. [...] You did not ask it but I will answer. [...] the question you did not make is: what kind of institutionalization would help to have PBL adopted? Look, USP East [...] was the only manner of get it implemented. At FEA, I don't believe. Why? Because the faculty level of independence is so high, that if you oblige them to adopt, they will never do so. (Interviewee 2)

In other words, the respondent has not shown enthusiasm for PBL in the short term, but nevertheless mentions projects that are developing, which even contains institutional partnerships in Brazil and abroad.

5 Conclusions

This research began with the goal of answering the question "What does research indicate as (dis)advantages of using PBL in Accounting undergraduate courses?" and soon in the very characteristics of the object of study - PBL in Accounting - the research identified a number of interesting situations.

The first ones were identified during the bibliometric study on the subject. The research at the international level through the Scopus database returned only three of six articles conveyed by the Journal of Accounting Education and three in Issues in Accounting Education, all published since 1998 (5 from 2010) which shows that PBL, as an object of Accounting research, is a fairly recent phenomenon and still in its infancy.

To identify whether such a situation is replicated in Brazil, a bibliometric analysis was carried out using a set of journals, conferences and repositories of thesis and dissertations. It was found that the Brazilian Accounting research about PBL is also timid: only seven studies were found, three of which were considered definitive publications (e.g. published in the journal).

¹ Workshop about PBL, realized in FEA/USP, 2013.



It can be concluded that Brazilian researchers who wish to invest in research about PBL implementation and its use in the 1,164 undergraduate face-to-face and distance courses in Accounting would find fertile ground to develop their agendas for a long time from various points of view.

From the point of view of the advantages and disadvantages of using PBL Accounting courses, the results of the interviews conducted were consonance with the findings of several previous studies. The development of communication skills, problem solving and teamwork were advantages of adopting the method that had also been detected in previous research (Lobosco (2007), Soares and Araujo (2008), Siqueira et al (2009), Dee and Deutsch (2010), Benjamin Jr. (2011) and Stanley and Marsden (2012)).

The good reception of the method by most students, and the negative reaction from a minority had also been detected (Araujo and Rodrigues, 2007; Soares and Araújo, 2008; Cotel, 2010). The poor reception of the method by a small group of students is a disadvantage explained by some common factors such as lack of familiarity by the student with the methodology and the high burden of work demanded and, according to the literature review and interviews, demands more effort.

Finally, this study allowed us to identify some methodological outline of the research about PBL in Accounting: the methods used are experimental or quasi-experimental, and methods of data collection, such as observation, surveys and interviews, and the use of common questions with Likert scale surveys. The analysis is predominantly qualitative and quantitative. Studies conducted with groups of students composed of 30-80 students, are generally elongated into large cohorts. The study Stanley and Marsden (2013) was the only one to extend data collection to nine cohorts.

Those are partial results of an ongoing research that has later stages where we intend to analyze the different views of other stakeholders involved in the PBL implementation and use in Accounting Education.

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Appendix 1 – Brazilian Journals on Accounting

Name, Institution, Qualis, Year of first online edition.

ABCCustos [ABC, B4, a partir de 2006]
Advances in Scientific and Applied Accounting [ANPCONT, B2, a partir de 2008]
BASE [UNISINOS, B1, a partir de 2004]
Brazilian Business Review - BBR [FUCAPE, A2, a partir de 2004]
CAP Accounting and Management [UTFPR, B5, 2006]
Contabilidade Vista e Revista [UFMG, B1, a partir de 1989]
Contabilidade, Gestão e Governança [UNB, B2, a partir de 1998]
ConTexto [UFRGS, B3, 2001]
Contextus [UFC, B2, a partir de 2003]
Enfoque: Reflexão Contábil [UEM, B2, a partir de 2005]
Pensar Contábil [CRC RJ, B3, a partir de 2004]
RACE: Revista de Administração, Contabilidade e Economia [UNOESC, B2, a partir de 2007]
RACEF - Revista de Administração, Contabilidade e Economia da FUNDACE [FUNDACE, B3, a partir de 2010]
REAVI - Revista Eletrônica do Alto Vale do Itajaí [UDESC, B3, 2012]
Registro Contábil - RECONT [UFAL, B3, a partir de 2010]
Reunir: Revista de Administração, Contabilidade e Sustentabilidade [UFMG, B4, a partir de 2011]
Revista Ambiente Contábil [UFRN, B2, a partir de 2009]
Revista Brasileira de Contabilidade [RBC, B5, a partir de 1999]
Revista Brasileira de Gestão de Negócios - RBGN [UNIFECAP, B1, a partir de 2005]
Revista Catarinense da Ciência Contábil [CRC SC, B4, a partir de 2001]
Revista Contabilidade e Finanças [FEA/USP, A2, a partir de 1989]
Revista Contemporânea de Contabilidade [UFSC, B1, a partir de 2004]
Revista de Administração e Contabilidade da FAT [FAT, B5, a partir de 2009]
Revista de Ciências Contábeis - RCiC [UFMT, C, 2010]
Revista de Contabilidade da UFBA [UFBA, B4, a partir de 2007]
Revista de Contabilidade do Mestrado em Ciências Contábeis da UERJ [UERJ, B3, a partir de 2003]
Revista de Contabilidade e Controladoria [UFPR, B3, a partir de 2009]
Revista de Contabilidade e Organizações [USP/RP, B1, a partir de 2007]
Revista de Educação e Pesquisa em Contabilidade - REPEC [CFC, B2, a partir de 2007]
Revista de Estudos Contábeis [UEL, B4, 2010]
Revista de Gestão, Finanças e Contabilidade [UNEB, B3, 2011]
Revista de Informação Contábil [UFPE, B3, a partir de 2007]
Revista Eletrônica de Contabilidade [UFSC, C, 2004]
Revista Eletrônica Saber Contábil [ULBRA, a partir de 2011]
Revista Razão Contábil & Finanças [FATE, B5, a partir de 2012]
Revista Universo Contábil [FURB, B1, a partir de 2005]
Sociedade, Contabilidade e Gestão [UFRJ, B2, a partir de 2006]