Active methodology: the experience of the Land Regularization Commission (CRF-UFPA) in the qualification of registry agents

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Abstract

When the comprehension of a natural phenomenon comprises a theoretical background, such knowledge can be accessed more quickly when faced with a similar situation (Godden and Baddeley, 1975; Prawat, 1989; Tavares, 2018). Therefore, we believe that the context of university extension contributes to the formation of citizens, as it presents the contact of academics with society, in which the theories learned in the classroom occurs. Practical experience plays an essential role in adults' training since living with real market situations enables them to solve problems more quickly and efficiently. Thus, this study aimed to present the Land Regularization Commission (CRF) experience using the active Problem-based learning (PBL) methodology as a teaching-and-learning strategy for the territorial physical survey team. With a qualitative approach, this study described the methodological strategy of selection and training registry agents for the "Meu Endereço'' extension project, developed through a partnership between the Science and Technology Secretariat of Pará State (SECTET), and the Federal University of Pará (UFPA) through its CRF. As a result, we observed that the PBL methodology proved efficient in developing teamwork, proactivity, and sensitivity. It stimulates discussion in all work execution stages. It makes the professional / student establish other relationships than merely performing a task.

Keywords: PBL training; University extension project; Interdisciplinarity.

1 Introduction

Throughout the labor market changes, new activities have emerged as indispensable elements in searching for competitive diversity, such as information technology (Santiago, 2016). It seems to be at the top of skills that the labor market requires, but not the only one, demanding younger graduates with higher holistic competencies. Although such demand is an upward trend, the labor market misunderstands how schools with many curricular subjects during graduation can fit perfectly into the professional profile that the market expects? To Tavares (2018), placing students in collaborative and active environments improves practical learning, turning egresses more prepared to face the diversities of the labor market. In those environments, they can work in groups to solve concrete problems, produce artifacts, develop content, participate in a debate, or win the game stages. It develops the skills and competencies with excellent performance.

According to the National Curricular Guidelines for Engineering (BRASIL, 2002), Art. 3, the egress must develop new technologies, according to the current events, and mainly to solve problems that may arise in this process (Vieira,2015). In this perspective, active methodologies are essential to achieve this goal. They are teaching and learning models that differ from the traditional methodology in terms of dynamics. It assumes that watching lectures and reproducing exercises are way less effective than actively interacting with tutors and partners. For this reason, the relationship between the labor market, Higher Education Institutions (HEI), and professional training is the central theme of this article.

Then, the research question follows up the CRF need of developing multiple skills in registry agents: How can we develop registry agents to work on-site with urban regularization activities? How can active learning methods such as PBL address this educational gap? Therefore, this essay aimed to demonstrate how training courses based on active methodology such as Problem-Based Learning (PBL) develop the demanded skills from registry agents in a Land Regularization Project developed in Northern Brazil. This project, called "Meu Endereço - Lugar de Paz e Segurança Social" (My Address - Place of Peace and Social Security), develops technical assistance to low-income households in the metropolitan area of Belém (RMB). It results from a

partnership between the Government of Pará State and the Federal University of Pará (UFPA), a Department designed to do so (Land Regularization Commission - CRF). Presenting a descriptive form and qualitative approach, we present the experience of training the registry agents to work in the Multipurpose Technical registry (MTR) in the Cabanagem neighborhood. We highlight that this is a scientific paper based on empirical studies. For that reason, the following four sections as a theoretical framework to develop the case study.

2 Higher education and socioeconomic issues

According to Pieri (2018), the human capital theory developed in the last forty years establishes a relationship between individual investments in education and future returns in the labor market. This author has tested this theory empirically. Experiments in several economies have shown a causal relationship between education and success in the labor market, measured as higher wages and shorter periods of unemployment. When starting the academic journey, we hear that the only way to change our lives is through education. Those who commit themselves to this long journey believe that education is indeed transformative. Even if the path leads to a successful position in the labor market, the consensus is that the social benefits of investment in education go beyond. Concerning these benefits, Pieri (2018) states a big difference in economic and social performance between individuals who have studied more than those who are less educated. Higher educated people tend to live longer, with better health conditions, get jobs with higher salaries, and are less likely to engage in criminal activities.

According to him, Brazil's wage differences reach 230% between those who have finished high school and those who have just finished elementary school. Pieri (op cit.) still reveals that the unemployment statistics affect people much less than those with higher education. According to him, in 2015, about 10.5% of the economically active population was unemployed. Nevertheless, among individuals with a college degree, unemployment was only 5.2%. This market demand for higher education professionals raises the unemployment rate among young people aged 15 to 24-year-old. In this way, Informatica transformations have resulted in profound changes in the labor market, mainly affecting young people. According to recent data, in 2017, 26 million people were unemployed in Latin America, out of which 10 million were younger than 24 years old. Because of these circumstances and the countless capacities that organizations look for in a professional, it is vital to understand how universities have been working to facilitate their students' insertion in the job market.

3 University triad in the knowledge development

In recent years, education in Brazil has undergone continuous changes influenced by several factors: either by the laws of the Brazilian Ministry of Education (MEC), by the peculiarities of public or private HEI's, or by the current increasingly globalized and competitive labor market. These factors influence and drive the national teaching guidelines, continuously structuring curricular courses and new teaching-and-learning methodologies. In this sense, HEI's play a transcendental role in transforming this process by encouraging the development and the incorporation of advanced teaching strategies based on active research and innovation. (Urresta, Urresta & Canacuán, 2019). These authors highlight the need to produce and discuss studies about the higher education formation and teaching-and-learning process. It occurs because Brazilian universities generally turn their quality and productivity measures to international parameters detached from local reality (Ferreira and Florio, 2018). Therefore, HEI's have improved their parameters through the university triad, namely teaching, researching, and mentoring. Such triad aims to fulfill labor market needs with well-prepared professionals and academia with scholars attained to societal non-solved problems.

In this sense, discussing and reflecting on how the University can help its students build a solid education and a successful professional life emerges as an educational urgency. For that, Pieri (2018) emphasizes that the ideal way of measuring the quality of education is a challenge that specialists have been facing for a long time. Is it essential to understand what society desires from educational systems and what kind of professionals HEI wants to graduate? Do we need to know if we conceive the future's great minds, the best scientists, and great entrepreneurs? Or if we want to train many people with minimal acceptable knowledge? Thus, we need to

consider training professionals with diverse characteristics and skills to find quick solutions to the required problems and capable of directing behaviors and planning new methods.

4 University extension as the professional formation and an HEI-Society integration strategy

According to Rodrigues et al. (2013), university extension has a vital role concerning the contributions it can bring to society. These authors argue that the University shall present a conception of what the extension improves community life in general, practicing what has been learned in the classroom and developing it outside the academic bubble. From the moment this scholar-society contact occurs, benefits happen on both sides. The academic ends up learning much more when there is this contact. It becomes much more rewarding to practice the theory received within the classroom. (Rodrigues et al., 2013). At UFPA, the incentive for university extension comes from public notices or institutional partnerships. Students and teachers develop an interdisciplinary project related to their courses. The teacher acts as a tutor who guides the student's actions whenever requested and accompanying each stage of the Project's execution. For Carbonari and Pereira (2007), the academic extension, as a social responsibility, is part of the new culture. Such condition causes the most significant and most crucial change registered in the corporate, academic environment in recent years. In their vision, the great challenge of extension is to rethink the relationship between teaching and researching to attempt social needs and establish the extension's contributions to the deepening of citizenship and society's practical transformation. Thus, extension practice develops critical thinking. The on-site experience develops in the student to deal with situations previously unimaginable or even discussed in the classroom.

5 University extension as the professional formation and an HEI-Society integration strategy

The pedagogical theories that explain learning approaches consider the "subject" who learns the "object" and the "mediation" between the subject and the object carried out in society. Several forms of active teaching and learning methods have been developed in the last decades, such as Project or Problem-Based Learning - PBL, Flipped Classroom, Games oriented activities, or using simulations. Aligned to the PBL strategy, many curricula oriented to active guidelines operate in various colleges worldwide. The Harvard Business School was the pioneer in the active method by introducing group discussions about real problems as an essential part of the learning process (Penaforte, 2001; Neves, 2009). Therefore, problem-based learning (PBL) emerges from the past due to the social need for future egress to solve real problems. Given its impact on university education, the University of Aalborg (Denmark) developed it through the International Centre for Problem-Based Learning to answer upward demand for developing holistic and critical college egress skills (Aalborg University 2015 and Padrón & Martin, 2018).

In Brazil, few HEI's introduced the PBL throughout the 1990s in graduate (1993) and undergraduate (1997) courses. PBL is a method that emerged to instruct professionals, bridging the gap between theory and practice (Frost, 1996; Neves, 2009). In this perspective, the Land Regularization Commission (CRF) team, composed of teachers and technicians responsible for training new registry agents. CRF decided to adopt PBL to teach and transform the training into more dynamic and motivating. According to Samaddar and Mukhopadhyay (2014) and Restrepo (2005), the sequence of steps determined for applying the PBL method varies according to the learning goal's specificities and the local context. However, in different countries and HEI that have developed experiences with the application of PBL, majorly in health and business schools, the number of steps or activities to carry out the results are adapted. Thus, CRF adopted the following sequence to conduct the PBL in the registry agent course: Step 1 – Theme and problem analyses; Step 2 – Activation of previous knowledge; Step 3 – Work planning for preparing the data collection; Step 4 – Material presentation and problem discussion; and Step 5 – Evaluation.

6 The “Meu Endereço” project

The "Meu Endereço'' project appears as a university extension initiative to contribute to reducing the rate of urban socio-environmental conflicts in the seven pacification territories of the TerPaz State Program, exercise 2019, namely Terra Firme, Guamá, Jurunas, Cabanagem, Nova União, Benguí, and Icuí, located in the metropolitan area of Belém (RMB), capital of Pará State, Northern Brazil. The "Meu Endereço'' Project integrates actions of the Secretariat for Science, Technology, Professional, and Technological Education of the Pará State (SECTET) and the Federal University of Pará (UFPA) through the Land Regularization Commission (CRF). The Project has three main principles: technological innovation, multi-professional technical assistance, and social inclusion, which articulate engineering, architecture, urbanism, legal and communication, and social service, among others, under the perspective of guaranteeing the constitutional principle of the dignity of society. Such actions involve technicians from public and private institutions, public servants who work in conflict mediation, territory households, besides UFPA teachers, technicians, and students.

The work developed by the Project often requires a technical home visit to the properties. The registry agent goes to the property to interview and collect information from the household to technicians and students to prepare the project Kit. The project kit comprises technical pieces to settle the property's land title - as floorplans and basic projects, legal statements, and whatever document necessary to provide legal security of the land and social dignity. The technical visit proceeds by the teams of engineering, social, architecture, or legal sciences. The objective is to carry out the socioeconomic and physical-territorial registration of the property visited, that is, measures, social and neighborhood relations.

The physical territorial survey has always focused on many doubts concerning the engineering team's activities, mainly on measurements. As we know, measurement in engineering and architecture services has its particularities depending on its purpose. In the "Meu Endereço" project, the demands are diverse, such as property valuation, construction inspection, design attendance, household expectation, and legislation. Therefore, the lack of visit specialization resulted in many comings and goings to the field. Thus, the need to develop each team's role in solving specific problems and actively searching for knowledge motivated the adoption of PBL training.

6.1 Step 1 – Theme and problem analyses

The problem is the central element in PBL since learning begins when students face it (Neves, 2009). In this experience, the problem concerned creating a schematic sketch of the property visited that meets the requirements for making future technical pieces. Any person on the team does the same reading of the drawing? As a guide for thinking about solutions, we established the following guiding questions: the most frequent answers are in Figure 1.

• Q1. What information do we consider relevant for the engineering team to collect at the technical visit?

• Q2. What data is essential to collect?

• Q3. What instruments should we take with us on the visit?

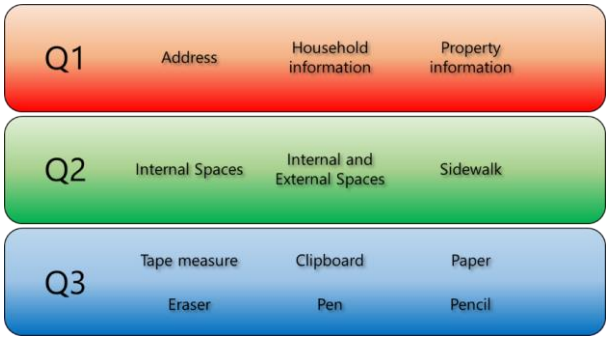

Figure 1. Result of the student's answers to the guiding questions.
Source: Research data

As a result, we found that many of our collaborators/students had not previously tried/experienced working on other engineering subjects such as land title regularization. The Engineering College focuses on civil construction and architecture, but other engineer's needed competencies lack social assistance and regulation accomplishment. Thus, the need to activate knowledge related to the field of land title regularization in step 2.

6.2 Step 2 – Activation of previous knowledge

In Step 2, we conducted instruction courses about land title regularization when the registry agents became aware of such subject's fundamentals and techniques. Figure 2 shows the students taking measurements where the theoretical class occurred to training field action.

Figure 2. Images of the theoretical and practical expository classes.
Research Data

At this stage, the lecture strategy adopted the use of PowerPoint. Here, the team of tutors addressed the main issues surrounding the issue of urban land regularization. It also addressed how the engineer's role within land regularization actions and schematic sketches, relevant real estate information, measurement and data collection equipment, approach, and design standards. After presenting the themes, we asked the participants what theme they would like to take a practical class to solve the existing doubts. By vote, we carried out a practice between the teams on the manipulation of the measuring tape. This activity aimed to train the registry agents' practical performance by identifying and assessing possible difficulties throughout the measuring protocol exercises.

6.3 Step 3 – Work planning for preparing the data collection

In Step 3, we proceeded to the composition, formation, and distribution of the team for the technical home visit stage. It was time to direct the team to the field survey (Figure 3) after the knowledge activation stage. We composed the teams in a multidisciplinary way of undergraduate students from engineering, architecture, geography, social work, and law, besides two local households from the surveyed community.

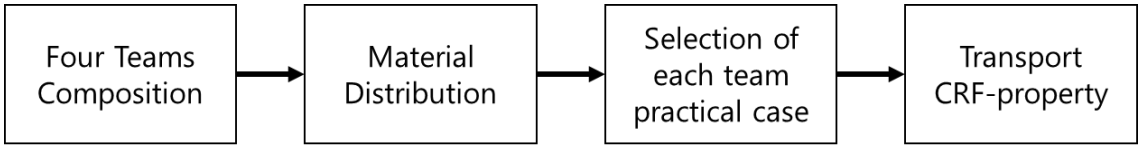

Figure 3. Field activity planning
Source: Research Data

The agents' profile was varied because among the community representatives. We sought to use a technical but accessible language to those who are not technicians nor academics. Figure 4 shows the team on a technical home visit. In this step, the registry agents should exercise the classroom lessons in practice, reaching local households and properties for surveying socioeconomic, socio-environmental, and urbanistic data. Interview skills, measuring, sketching, and photographing concerned some related skills to the practical activities.

Figure 4. Field activity
Source: Research Data

6.4 Step 4 – Material presentation and problem discussion

In Step 4, each team member had the opportunity to report their impressions of the technical visit. During the talk time (Figure 5), strong interaction with households was evident in the agents' discourse. It was common among the teams the perception that the registration exceeds the limits of data collection and advances to neighboring relationships. Then, the field survey often requires much more time than the planned one due to this willingness to bring residents closer.

Figure 5. Talk time
Source: Research Data

Also, we observed that the difficulty of measuring was not among the subjects. It took more effort to collect social data concerning land regularization, neighborhood conflict, housing improvement, and technical assistance to access government programs. Each situation aroused problems neither initially claimed by the households nor previously predicted by CRF, resulting in countless discussions on how to help them.

6.5 Step 5 – Evaluation

In Step 5, the validation stage, we conducted an expository class (Figure 6). We invited all teams to present the results of their technical visits (observations, sketches, photographs). The teams that were not presenting should analyze the technical parts of the team that was presenting. The objective was to carry out the survey's quality control and draw attention to the care that the survey requires.

In this step, the registry teams presented how they identified multiple site problems and managed conflict occurrences. Most of the teams revealed tool handling difficulties, poor photographic performance - leading to a lack of visual record.

Figure 6. Presentation class.
Source: Research Data

7 Final Remarks

According to Suguinoshita et al. (2017), multiple Brazilian schools seek to adopt active learning methods in their curricula to improve student performance. Those methods, such as PBL, represent a disruptive teaching and learning method at all educational levels, especially in team-based courses. The investigation and solving-problems based-actions lead the students to develop a critical sense, maturity, and teamwork competencies vital in a post-academic professional context. In this sense, we address the research question related to developing multiple skills in registry agents who work with urban regularization activities by active learning methods such as PBL.

In this sense, Brazilian students who enter higher education programs in the 21st century are younger than the last generation, with an average age range of 21 to 30, according to the ENEM (National High School Exam). Perhaps this prematurity is the central factor for the significant dropout rate in Brazilian HEI's. In the 2010 Census, there were 228,683 dropouts compared to 1,773,315 students enrolled in public HEI's, a dropout rate of 12.9%. This index shows that, of every 100 students entering the Brazilian university system, practically 13 are not successful in fulfilling curricular activities and graduating. (Sales Jr, 2011).

Because of this reality, Higher Education Institutions must find ways to make teaching and learning more motivating. Besides, they must add interactive teaching activities that lead the students to experience the labor market dynamics and prepare them to act proactively. The students must criticize and reflect on the social context in which they participate. Certainly, extension activities throughout academic life are robust instruments in achieving these goals. In the context that involves the functions of the Brazilian University, especially extension projects for junior companies and supervised internships may contribute significantly to their new perspective of placing their work at the service of the interests of the vast majority of the population. PBL actions do not exhaust the efforts made by higher institutions in searching the interaction and practical experience for their students and thus contribute to their employability as soon as they graduate.

Therefore, the lessons learned from such experience are notorious. The PBL application in the CRF project revealed an excellent teaching and learning strategy to develop registry agents for urban regularization. This approach resulted in good approval from multiple groups involved in the CRF - engineering professors, students, interns, and local households, which potentializes the interdisciplinary schedule enabled through active learning. By the PBL method, we efficiently assessed the development of the registry agents, allowing us to directly adjust the courses into a suitable approach to reduce weaknesses and improve strengths to assist extension projects better. For further research, we suggest investigating how PBL can be implemented in other subject extension courses, especially those related to public assistance. This research adds value to the literature in active learning to extension project purposes, developing on-site skills to address urban regularization activities. It also leads to a practical contribution to the professional development of urban regularization workers in the Brazilian Amazon, where cities need expressive levels to manage the urban land properly.

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