

## PROBLEM-BASED LEARNING (PBL): A STRATEGY FOR TRAINING THE PSYCHOLOGIST AS A HEALTH PROFESSIONAL

### APRENDIZAGEM BASEADA EM PROBLEMAS: UMA ESTRATÉGIA PARA FORMAÇÃO DO PSICÓLOGO COMO PROFISSIONAL DE SAÚDE

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**ABSTRACT** | This paper describes the perception of psychology students regarding their experience with problem-based learning (PBL). This descriptive, exploratory study is part of a doctoral thesis and uses a qualitative approach to analyse the contents of 51 questionnaires completed by students in psychology course in Bahia, Brazil. The institution's internal review board approved the study protocol under reference number 108,985 (CAAE 03670812.7.0000.5544). Data analysis using a meaning interpretation method identified three categories of response: positive (indicating the development of competencies); tiring (but indicating the development of competencies) or negative (no competencies were developed). Regarding the competencies acquired, the students mentioned developing interdisciplinary approaches, skills related to communication and research, autonomy and personal growth

**Keywords:** psychology; PBL; health; active methodologies; training.

**RESUMO** | Este artigo, é parte de uma tese de doutoramento, descreve a percepção de estudantes de psicologia sobre a experiência de aprendizagem através do método da Aprendizagem Baseada em Problemas (PBL). Estudo descritivo exploratório de abordagem qualitativa, analisa conteúdo de 51 questionários de estudantes matriculados do 8º ao 10º semestre de um curso de Psicologia na Bahia-Brasil. Estudo aprovado pelo Comitê de Ética, parecer 108.985 (CAAE 03670812.7.0000.5544). Dados analisados pelo Método de Interpretação de Sentido identificaram 3 categorias de respostas: Positiva, com Desenvolvimento de Competência; Cansativa, com Desenvolvimento de Competências; Negativa, sem Desenvolvimento de Competência. Os alunos afirmam o desenvolvimento de atitudes interdisciplinares, de comunicação, pesquisa, autonomia e amadurecimento pessoal. Discute-se a importância do deslocamento do professor para uma posição de pesquisador com importante elemento para o desenvolvimento integrado de competências atitudinais, conceituais e técnicas .

**Palavras Chaves:** Psicologia. PBL. Saúde. Metodologias Ativas. Formação

## INTRODUCTION

The mission of qualifying psychologists to meet the demands of contemporary society has led to a more generalist professional profile. The traditional curricular structures used in undergraduate psychology courses in Brazil have resulted in professionals with the academic background of specialists, particularly in the domains of clinical and organizational psychology, which are fields already well established in this culture. The new professional possibilities that have emerged require curricular structures that focus on the continuous production of multiple identities, maintaining a solid theoretical basis but encouraging autonomy in the construction of knowledge over the span of a career. This scenario demands a careful look at teaching methods and the learning techniques currently applied in undergraduate psychology courses.

Undergraduate training is the initial step in a knowledge acquisition process that internalizes as a permanent feature of an individual's professional life. The challenges of this phase involve providing the students with information on their chosen profession, its theoretical and technical bases, and possible interventions. On the other hand, exposure to the university environment is, in itself, a factor that leads to personal growth. The student is provided with a space in which beliefs are questioned and the complexity that exists in the world is identified. Thus, the students' critical and cognitive abilities strengthen as their attitudes change from a state of inflexibility to one of elasticity, with the learning process allowing the subject to recognize the inexistence of absolute truths and the presence of different points of view (Coulon, 2008; Mitre et al., 2008; Papalia & Olds, 2000).

The view of the student as a social subject requires the university to apply different approaches to teaching. Within this perspective,

values are developed, as well as ethical, attitudinal, political and technical competencies. The university programs address theory, critical reasoning, responsibility and sensitivity to questions related to life and to the complexity of current society (Mitre et al., 2008).

Under decree #403, the Brazilian Federal Council of Education implemented an undergraduate program for a Bachelor degree or teacher certification in psychology in 1962. Initially, a pre-established program relied on a discipline-based curriculum to be completed within a minimum of four years, including a mandatory 500-hour supervised practical training in the student's final year. Apart from some minor alterations, this model remained the same up to the beginning of the 21st century, until the National Curricular Guidelines governing undergraduate courses in psychology were published in 2004. The model was further updated in 2011 when the teacher-training program was reinstated.

A review of the Brazilian university education proposed in 2000 ultimately led to implementation of the new National Curricular Guidelines. The changes were in line with the worldwide debate on the concept of higher education based on competency development. Models of teaching and learning were reviewed with the objective of encouraging student-regulated learning. Changes were inspired by the four pillars of learning proposed by the United Nations Organization for Education, Science and Culture (UNESCO) (1988) for the 21st century: learning to know; learning to do; learning to be; and learning to live together. A new profile of professional thus surfaced, requiring the institutes of learning to prepare citizens who would be autonomous, have critical capacity and the freedom to live and work in a society permanently in movement (Veiga Simão, Flores, Fernandes, & Figueira, 2008).

The concept of competency development stimulated debates on the use of active methodologies and strategies to accomplish the proposed objectives. Indeed, students should be offered the possibility of an integrated educational experience based on meaning in learning, with theoretical knowledge applied in practice and anchored in the search for autonomy (Araújo & Sastre, 2009; Mitre et al., 2008; Veiga Simão et al., 2008; Chiesa, Nascimento, Braccialli, Oliveira & Ciampone, 2007).

The educational thinker Paulo Freire considered the use of active methodologies to be vital for implementing a process capable of creating transformation, particularly in adult education. Freire (2005) proposed a method based on transforming actual routine experiences into problem statements, targeting empowerment and a critical interpretation of reality. Within such a dialogical process, learning becomes an action of culture and freedom. Freire emphasized the political nature of the methodologies selected for use in a given course, since the need to seek autonomy and to give value to knowledge already in circulation binds the educational process to diversity, to ethical principles, to the interpretation of cultural, ideological and historical contexts, and to the notion that knowledge is permanently under construction.

A curricular structure that invests in the use of active methodologies is open to the possibility of shattering educational paradigms based on the accumulation of knowledge or on models of healthcare shackled to the pathologizing perspective of a purely assistance-based nature, which is hegemonic in Brazilian culture and in the teaching of psychology.

The use of active methodologies implies that knowledge consists of a complex structure in permanent motion of continuity and rupture, demanding new visions and knowledge on the

subjective positions of the roles of student and professor. The exercises of curiosity, intuition and emotion associated with the ability to question and observe are identified by Mitre et al. (2008) as constituting basic elements for the construction of meaningful learning, permitting different types of associations to be established between facts and objects, triggering new constructions and reconstructions of meaning and contributing to their use in different situations. This perspective erases the traditional roles of professor and student within the historical structure of Brazilian education.

Indeed, active methodologies give rise to interactive processes of knowledge construction, analysis, study, research and individual or collective decisions aimed at encountering solutions to the learning problems presented (Bastos, 2006). The interactivity involved in active methodology provides an opportunity to assimilate the different dimensions that form part of this construction of knowledge and professional identity (Berbel, 2011), in addition to allowing students and professors to develop the competencies required for research and helping them make decisions on the path they wish to follow within the teaching and learning process. This methodology promotes a type of learning that involves theory and practice, one that demands teamwork and encourages the subjects to seek interdisciplinary solutions (Veiga Simão et al., 2008).

The present study analysed the perception of psychology students exposed to problem-based learning (PBL). PBL in medical education originated in the McMaster University in Hamilton, Canada around 30 years ago. The methodology was developed to enable students to have direct contact with actual problems even before reaching internship (Hmelo-Silver, 2004). Based on actual cases, this teaching method offers a learning context that provides the student with legitimate individual growth through the development of competencies

that empower his/her actions in actual social circumstances, with the objective of meeting the growing demands of the contemporary world for social transformations (Queiroz, 2012).

The association between learning to know, learning to do, learning to be and learning to live together is the key to the teaching and learning process in the undergraduate psychology course at the Bahia School of Medicine and Public Health, a higher education institute situated in the northeast of Brazil and the setting in which this study was conducted. According to the curricular structure, the psychologist is considered a health professional in the broader sense of the term. This integrated curriculum encompasses the use of different teaching modalities, involving an increasing degree of complexity and permanent interdisciplinary work.

A curriculum is considered integrated when it includes work/teaching, practice/theory and teaching/community in a dynamic manner (Kodjaoglanian et al., 2003), contemplating the sociocultural characteristics of its environment and time. The curriculum presented here is based on the development of conceptual, attitudinal and technical competencies through the organization of a solid methodological structure that articulates thematic axes, curricular components and a system of process evaluation. This methodological structure proposes to meet the challenge of giving the student the responsibility for constructing his/her own knowledge and a repertoire of attitudes that will allow him/her to respond technically, ethically, and in an interdisciplinary fashion, communicating clearly and managing knowledge as a researcher, equipped to work in a team.

In this curriculum matrix, PBL is used as a methodological strategy in six components of the first segment of the Life Cycle Development module. These components are applied between the first and sixth semesters in groups of no more than 15 students per professor,

involving approximately half the faculty in the course and almost a quarter of the course's total workload. The objectives of the Life Cycle Development module are to study human beings in the various phases of their existence, contemplating the multiple causes of the health-illness process, and more specifically, to study the psychological phenomenon according to the different development theories. The module also encompasses studies on human rights, public policies and psychopathological concepts associated with contemporary issues in society. In each semester, one of the steps in the life cycle is studied. Whenever possible, the topics are linked up with the other components of that semester's curriculum.

### The Problem-based learning (PBL) method

Debates on problem-based learning began in Brazil at the end of the 1990s. PBL was expected to adequately meet the demand to transform undergraduate medical training by increasing the student's motivational level and his/her problem-solving capacity, consequently resulting in the development of autonomy (Hmelo-Silver, 2004).

In the field of psychology, PBL has been in use in Brazil for more than ten years. Based on the concept of meaningful learning, this method aims to increase the student's capacity to retain information and to use his/her basic knowledge to seek clinical solutions (Gomes, Brino, Aquilante, & Avó, 2009; Lee & Kwan, 1997; Norman & Schmidt, 1992). The method adapts well to the teaching of psychology, since it enables complex and multidimensional phenomena to be presented and analysed in the form of case presentations.

Based on constructivist epistemology, the method is organized along four main axes, as follows:

- An integrated curriculum with traditional scientific disciplines distributed in thematic axes.
- Problem-based learning that seeks to

replicate actual cases, promoting investigative skills and the ability to work in small groups.

- Insertion of the students into public healthcare services, investing in the development of meaningful learning.
- Process evaluation (Venturelli, 2003).

Problems are presented to small groups of students, who initially analyse them based on knowledge they already hold. They are then instructed to look for new, different information that will allow them to solve the problem. By working together and researching information in the process of resolving these cases, the students are encouraged to learn how to express their ideas collectively, organize their thoughts, construct syntheses and elaborate reports. Being challenged to actively seek solutions to problems (Araújo & Sastre, 2009; Gomes et al., 2009), students are gradually prepared for insertion into the fields of practice.

Another remarkable characteristic of PBL is teaching based on tutorial groups. Veiga Simão et al. (2008) showed that within the context of higher education, tutoring encourages the integrated development of the student's intellectual, affective, personal and social dimensions. Tutoring permits the singularity of the educational experience through individual follow-up, and encourages the student to further develop the knowledge and attitudes that will support him/her in their chosen academic path. Finally, tutoring is believed to facilitate the process of institutional affiliation, encouraging the institutional transit that Coulon (2008) considers fundamental in constituting the Student's Job.

PBL is one of the active methodology strategies used in the psychology undergraduate course at the Bahia School of Medicine and Public Health; therefore, some adaptations had to be made to integrate it into the general dynamics of the curriculum. Operationally, the use of PBL is organized as follows:

- Tutorial groups, to which cases are presented and solutions are found. Tutoring involves a maximum of 16 students for each tutor, is held at two weekly sessions of two hours each, with a minimum of four days between sessions;
- Forums of supplementary activities, in which all the tutorial groups of the semester come together approximately once every two weeks for 2-hour sessions. These complementary activities may take the form of conferences, debates on films, guided visits, round tables or any activity that encourages a more in-depth approach to theoretical material, synthesis or revision.

In this curriculum, clinical skills laboratories were included in the module Research Techniques in Psychology, parts I-VI, given in the first six semesters of the course together with the Life Cycle Development module; also forming part of the pre-professionalizing segment.

The tutorials are structured according to the PBL methodology and organized on the basis of the seven steps proposed by this method, as follows:

1. A description of the problem (case) is distributed to the students and read. Any unknown terms are identified.
2. The text is interpreted and discussed. The central problem and key words are identified.
3. Existing knowledge is listed and hypotheses are formulated (brainstorming).
4. A summary is made of possible hypotheses. A synthesis is made of the discussion.
5. The objectives of the information to be obtained are listed and the research strategies required to obtain the necessary information are identified (the suggested bibliographic sources and available resources).
6. Individual research and work with respect to the proposed objectives.
7. Synthesis. Discussion of the problem based on the research conducted, allowing a "solution" to be reached. Final synthesis, with a



report being drawn up later.

In the cognitive sphere, the use of PBL should create conditions that will enable the student to be trained, developing competencies that will permit him/her to autonomously look for information when faced with a problem situation or a clinical case, taking an epistemological and subjective stance (Berbel, 2011). The use of active-learning methodologies of this type emphasizes the fact that education is not a neutral field but, rather, an act that is always political, as mentioned by Freire (2011). In fact, it demands that all the educational actors be dialectically committed to the learning process, to the work conditions offered, to the valorisation of and commitment to the teaching capability of the method, to the process of constructing knowledge, but also to the subjects.

Within this perspective, this step in the doctoral thesis presents the perception of students in the 8th to 10th semesters on the learning experience acquired with exposure to the PBL model.

## MATERIAL AND METHODS

Students' perception of their experience with the problem-based learning method was investigated in this qualitative study involving all the 51 students enrolled in the second semester of 2014 in the 8th, 9th and 10th semesters of the psychology course. All the students selected had already completed the entire Life Cycle Development module. Data collection took place in the institute between October 29 and November 12, 2014 and all the participants signed an informed consent form. The internal review board of the Bahia School of Medicine and Public Health approved the study protocol on August 29, 2012 under reference number 108,985 (CAAE 03670812.7.0000.5544). A printed questionnaire containing open questions was distributed in the classroom and used to

obtain data on the students' age and sex, the semester in which they were currently enrolled and their perception on the experience of learning using PBL. They were also asked about the experience of internship and about the competencies that they had developed using this method.

The answers were analysed using content analysis based on the meaning interpretation method (Minayo, 2010). Initially, the set of responses were read, taking the following into consideration: words, actions and sets of inter-relationships and conjunctures in the material under analysis. Next, the singularities of the material were identified, the answers were classified and an interpretative content analysis was performed.

## RESULTS AND DISCUSSION

The PBL method enabled the students to play an active role in constructing knowledge, although their perception of this took on different interpretations. The answers, were classified into three categories of analysis to simplify data interpretation. These categories are (1) positive; indicating the development of competencies; (2) tiring, but indicating the development of competencies; or (3) negative; no competencies were developed.

Overall, the answers of 84.2% of the respondents (n=43) belonged to Category 1, indicating a positive evaluation of the method and affirming that competencies had been acquired. Content analysis suggests that exposure to the method moves the students from a position of passivity to actively constructing their own knowledge. Results also show that attitudinal competencies were acquired, particularly with respect to the student's ability to conduct research, communicate, listen and work in groups.

*The Life Cycle Development module came alive with PBL. My experience was very positive.*

*I became more motivated to study, so the learning process was much more effective than with the other modules. With PBL, you don't notice how much you are learning, because, in addition to the texts and discussions that take place in traditional expository classes, PBL puts theory into practice, sharing cases, facilitating reflection...it makes it easier to make sense out of the theory. It was easier to understand the content of the module. The competencies I acquired were: the ability to define objectives, dynamic reading of various texts, the ability to identify the principal problem in the cases shown (which helps a lot in practice), the ability to take a public stance, the ability to theorize and construct diagnostic hypotheses.*

*The learning method used in the Life Cycle Development module from the 1st to the 6th semester was extremely important in my training.*

*I learned to go beyond the textbooks. My interest in research increased and, best of all, I was the author of my own knowledge.*

*In my opinion, PBL is a different kind of method that is extremely effective. It encourages us to develop organizational skills, leadership, the art of questioning and debate.*

*I loved the PBL experience. I found it extremely enriching. It enables the student to conduct scientific research, and to develop critical thinking, the ability to reflect, and debating skills. PBL improves the interaction between the group members and increases the group's autonomy.*

*I believe that my learning experience in the Life Cycle Development module was very important as an initial form of encouraging study autonomy. The PBL method emphasises the need for commitment to studying and facilitates discussions on topics. In my opinion, the competencies that the method helps develop are organization, leadership, and the ability to deal with other people and with opinions that differ*

*from one's own.*

*The learning experience in the Life Cycle Development module with the problem-based learning method was very important, since it obliges the student to take responsibility for the subject, making him/her an active participant in the learning process. The skills developed include oratory (much emphasis is given during training to the student's capacity for synthesis and public speaking), research skills, listening, etc.*

*An extraordinary experience that I had never heard of before but that increased my ability to analyse and understand problems/cases from different viewpoints and perspectives. In addition, this method encourages the student to develop the habit of debating and discussing cases in such a way that one student adds to the input of another (teamwork). It helped me in my personal relationships with the team, helped me to work in a team and to develop skills to solve complex cases.*

As shown by these answers, PBL as a teaching method enables students to develop technical, cognitive and attitudinal skills applicable in healthcare. Its constructivist basis was also evident in the students' perception of a progressive transformation, particularly with respect to their ability to conduct research, since the perspective of self-training is at the core of the educational principles of this methodology (Gomes et al., 2009; Lee & Kwan, 1997). From the responses given, it was clear that the process favours the integration of teaching and research, the use of creativity and innovation, communication skills and meaningful learning, encouraging students to seek interdisciplinary solutions and stimulating integration between the university and society (Araújo & Sastre, 2009)

A further 13.7% of the answers (n=7) corresponded to Category 2, described as tiring, but indicating the development of competencies. The content of these responses suggests that exposure to the method produced transforming

effects irrespective of whether or not the subjects identified with the methodology. This highlights the need to discuss the number of components of the curriculum, and the semesters, in which this learning method is applied. In addition, this perception of tiredness needs to be better defined.

*Although I did not like the PBL methodology, I recognize its importance as an extraordinary experience that facilitates learning, including through the procedures of conducting research.*

*I found the experience tiring and coercive; however, I recognize that this imposed "contribution" (class participation) in PBL helped me deal with my shyness in class.*

*The PBL methodology allows the student to learn in a more dynamic way, facilitating learning and allowing the student to develop competencies such as speaking out in a group, respecting others, developing autonomy. My experience was very good during the Life Cycle Development module; however, it was sometimes tiring because we had to perform a considerable amount of research.*

*I thought it was very good and very useful for the development of the course. This methodology makes learning certain subjects easier; however, it was sometimes tiring. [The method helped develop...] competencies related to speaking in public, constructing objectives and conducting research.*

A study conducted at the University of Minho on the perception of professors regarding the implantation of a PBL-based curriculum in science and geography courses showed that the students also viewed the method as positive, particularly those whose performance with traditional teaching methods was poor. Those students became more independent in their learning activities and in relation to their rhythm, whereas students whose academic performance

was usually good became anxious with respect to what was to be evaluated and were dissatisfied with the fact that the professors failed to give expository explanations. The expression "tiring" was also mentioned by the professors in that study, who evaluated the experience as extremely demanding, particularly due to the diversity of tasks and the rhythms of the different groups (Leite et al., 2007). In the present results, the dimension of school performance did not figure in any of the students' answers; however, further studies may be able to clarify associations of this nature.

Category 3 refers to the experience with the method being classified as negative and not contributing towards the development of any competencies. However, this was the attitude of only one participant, corresponding to 1.9% of the total sample.

*I did not like the methodology used in the Life Cycle Development module, since too much emphasis was placed on the method and the majority of the professors would give little importance to listening. Most of the professors were from the field of psychoanalysis; hence they only offered and appreciated research in that area. Regarding competencies, I learned to express myself a little better; however, that competency was only really acquired during my internship at the hospital and with the professor's help and teaching skills.*

These last two categories highlight the positive action demanded of the student and the challenges this methodology represents in teaching. The following statement, which emphasizes the commitment of the actors involved with the educational potential of the method (Berbel, 2011), highlights the importance of the actors in obtaining the desired results.

*The Life Cycle Development module was a valid experience in some of the semesters because of the professors involved. It was a dynamic*



*learning process. Over a few semesters, we had some professors whose understanding of the method differed and who reproduced the same traditional academic evaluation methods in it.*

Overall, 72.5% of the students (n=37) perceived the learning experience as positive. Features particularly mentioned included increasing students' ability to communicate and interact in groups, indicating the development of research skills and interdisciplinary study.

*[The method encourages...]*

*... the development of skills that enable students to interact in groups (speaking, listening);*

*...students to work in a group, speak in public, learn to listen to others; listen;*

*...autonomy, group management, oratory.*

PBL allowed me to experience working as a group and as a multi-professional team. This exchange [between the group members] was vital in enabling me to acquire information, to learn to deal with others, without excluding or alienating them.

Taking into consideration accessibility, ethical principles, and dealing with information and interaction, Article 4 of the National Curricular Guidelines mentions communication as one of the general competencies required to exercise the profession. All of these perspectives were mentioned in the set of answers presented here.

In general, the narratives presented show that exposure to PBL allowed the students participating in this study not only to develop the ability to communicate, but also to develop a series of other competencies proposed in the National Curricular Guidelines for undergraduate training in psychology. Of these, autonomy, the ability to work in a team, active listening, and critical analysis of complex phenomena with the possibility of viewing them through different perspectives merit particular mention.

## FINAL CONSIDERATIONS

The curriculum presented here invests in active methodologies as a means of including the subjective dimension in undergraduate psychology training. The concept of generalist education proposed in the National Curricular Guidelines envisages the possibility of plurality of identity in psychology in current times, with the educational objectives being based on the development of professional and personal values and competencies.

In the present paper, the participating students recognize that the learning experience resulting from exposure to the PBL method allowed them to develop competencies and to recognize them as subjective productions.

The data analysis highlights the importance given in the narratives to the development of attitude. Queiroz (2012) calls attention to the fact that in PBL it is not the solutions to the problems presented that reflect the experience of learning, since the true phenomenon of learning occurs through the process of conducting research. The concept of research used here does not refer to the classic biomedical scientific training associated with the current productivist policy to which the institutes of higher learning are submitted; rather, it is an attitude of commitment and desire to construct knowledge that is very appropriate to the notion of the construction of identity that currently sustains working in psychology.

In a study conducted in 2009, Sales discussed the identity of the professor based on his/her attitude as a researcher and affirmed that the attitude of conducting research cannot do without the professor's ability to tolerate restlessness and uncertainties. This demands that the subject be his/her own research; explore a multitude of questions involving his/her knowledge of reality in his/her relationships with "what", "what for", "how" and "why" and "whom" to teach; demand a subjective attitude that seeks

to construct meanings based on the recognition that there are multiple truths in circulation. In this role of researcher, students and faculty place themselves at a certain degree of horizontality. Hence, it is important to emphasize the need for further studies that also take into consideration the professor's perception of the experience of being exposed to the method.

The literature on active methodologies affirms that the fundamental issue in learning is the significant focus that is placed on the student (Queiroz, 2012; Veiga Simão et al., 2008; Leite et al., 2007; Hmelo-Silver, 2004; Kodjaoglanian et al., 2003). The results of this study are in agreement with the importance of this centrality; however, doubts remain that this is the element of transformation. In fact, the significant centrality seems to be inserted within the ongoing dialogical process.

In this context, the professor is also challenged to develop new competencies. He/she works with small groups of students, together with other professors and often specialists from various different fields with different theoretical approaches. Therefore, he/she needs to invent, negotiate, divide; a practice that demands a new attitude to teaching. The professor who was originally trained according to the traditional teaching methods and who was encouraged to specialize, going on to obtain a masters or doctoral degree, is then called upon to use this training to practice a new construction based on an interdisciplinary approach and using research skills. This will be applied both in the construction of problems and in managing the tutorial groups in which the establishment of truths cannot be assumed and the actors in question and what they bring as knowledge are unknown, particularly when the topic to be studied is one as complex as the Life Cycle Development module.

When psychology is taught using PBL, professors and students dialogically construct a field in which subjectivities and identities are produced and negotiated. In this encounter of subjects in

unequal positions (because each one occupies his/her position at each meeting), subjects are equally researchers and students. Nevertheless, they need to leave behind the passive model they learned throughout the course of their education. Then they need to adopt the attitude of a researcher, relinquishing the position of the one who knows all the answers, and also forgoing individual work and self-importance. The option would be rather to work in an interdisciplinary manner, to be able to express themselves in public, keep an open ear, and provide a critical analysis. They also need the ability to synthesize, write, report and coordinate in a continuous experience of exposure and apprehension, a rediscovery of meaning, transformation and personal growth, as proposed by Paulo Freire.

They are thus forced to move away from their comfort zones and obliged to make the effort to enable this transformation to occur, which may justify the feeling of tiredness attributed by the students in this study and by the professors in the study conducted by Leite et al. (2007).

In conclusion, implementation of the PBL method is considered transformational within the field of psychology. It stimulates the development of autonomy with the consequent possibility of social transformation, particularly if the proposed curriculum also includes traditional expository classes and the experts' knowledge, without, however, giving these traditional teaching methodologies the preponderance that would distance professors from students, learning from learners and research from subjectivity.

#### COMPETING INTERESTS

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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