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The Perception of Students and Lecturer of Occupational therapy on the Importance of Involvement in Research Projects: The MIND & GAIT Project

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The Perception of Students and Lecturer of Occupational therapy on the Importance of Involvement in Research Projects: The MIND & GAIT Project

Abstract

Involvement in research is increasingly playing a crucial role in the training of higher education students, however, there isn't much found on the literature on this particular subject. The present study aims to gauge the participants' perception of pedagogical and scientific contributions in the development of research projects, specifically in the elaboration of a Cognitive Stimulation Program. Procedures followed a qualitative approach trough an exploratory descriptive case study research. For data collection, a semi-structured interview, a focus group, with key informants, and a questionnaire, were used for a set of participants (students and a professor) of the third year of Occupational Therapy Degree of the Polytechnic of Leiria. Data was processed resorting to content analysis according to Bardin and supported by WebQDA software. There was evidence of the pedagogical contributions, with perceived effective learning and scientific advancement, namely in the area of cognitive stimulation, particularly in the development of clinical reasoning. The students' practical involvement in research projects enhanced learning and knowledge acquisition, as well the advancement of research practice.

Keywords

Students, Higher Education, Research, Cognitive Stimulation, Mind & Gait

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The Perception of Students and Lecturer of Occupational therapy on the Importance of Involvement in Research Projects: The MIND & GAIT Project

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Involvement in research is increasingly playing a crucial role in the training of higher education students, however, there isn't much found on the literature on this particular subject. The present study aims to gauge the participants' perception of pedagogical and scientific contributions in the development of research projects, specifically in the elaboration of a Cognitive Stimulation Program. Procedures followed a qualitative approach trough an exploratory descriptive case study research. For data collection, a semi-structured interview, a focus group, with key informants, and a questionnaire, were used for a set of participants (students and a professor) of the third year of Occupational Therapy Degree of the Polytechnic of Leiria. Data was processed resorting to content analysis according to Bardin and supported by WebQDA software. There was evidence of the pedagogical contributions, with perceived effective learning and scientific advancement, namely in the area of cognitive stimulation, particularly in the development of clinical reasoning. The students' practical involvement in research projects enhanced learning and knowledge acquisition, as well the advancement of research practice. Keywords: Students, Higher Education, Research, Cognitive Stimulation, Mind & Gait

Research is increasingly playing a crucial role in the education of higher education students. Being introduced in undergraduate programmes, it is considered an opportunity for students to develop academic and interpersonal skills (Frade, Chora, Marques, & Sim-Sim, 2013). The participation in a project enables the acquisition of new knowledge and its applicability: the experience and learning of the research process; the definition of student interests for the professional future; and learning about the world after graduation (Ishiyama, 2014).

Students must be enabled to learn from the point of view of reflective and critical thinking, essential attributes for any health professional (Paranhos & Mendes, 2010). Collaborating in research projects provides students with the exercise of scientific content and the development of critical capacity, making them an added value for the integration in the academic environment. Additionally, it increases student confidence and promotes teamwork, as well as reducing school unsuccess (Ishiyama, 2014). Although involvement in research projects provides benefits to students, there is not enough empirical evidence to sustain these finding (Ishiyama, 2014).

For the past two decades, several studies have demonstrated the effectiveness of the use of active teaching and learning methodologies in Higher Education, integrated in a panoply of strategies known as active learning. This concept can be defined as "teaching strategies based on the critical-reflexive pedagogical conception" (Moreira & Ribeiro, 2016, p. 95), allowing interaction between lecturer-student and/or student-student. It is highly important, for the student to adopt an active role, as opposed to a passive reception behaviour, thus allowing maximum involvement in his or her own construction of knowledge. The various contributions for the students, who benefit from this type of learning, are at the level of increase of motivation and interest, ease of understanding of knowledge, skills development and better collaborative working capacity ("cooperative learning") (Machemer & Crawford, p. 11), either as a current student or as a future professional (Moreira & Ribeiro, 2016). Collaborative work, or teamwork, also benefits students' active learning, promoting greater productivity, creating new ideas and enhancing social skills (Machemer & Crawford, 2007).

The main examples of active learning methodologies are essentially: i) Problem-Based Learning (PBL), which gives special emphasis to problem solving or real significant situations; ii) Problem and Project-Based Learning (PPBL), in which students work as a group in the development of scientific or other projects, as well as in the search for solutions to various emerging issues; and iii) use of interactive games (Valente, 2014).

This work explores and describes the importance of using active learning, observing the fundamental exercise of PPBL, through the collaboration of students in the development of the Cognitive Stimulation Program (CSP), included in the Mind & Gait project. The PPBL allows the student to come across a new world: that of research, enabling the active search for information to support complex theoretical premises, consolidating and complementing with subjects learned in the different curricular units (Farias, Martin, & Cristo, 2015).

In the literature review, there was a small number of studies that reflected the importance of student participation in research projects as a strategy for the development of scientific and critical skills. As such, the current study intends to analyse, interpret and understand the perception of students and lecturers of the Occupational Therapy (OT) undergraduate programme, regarding the scientific and pedagogical benefits of participation in research projects. It is considered relevant and significant since there is little literature regarding the student´s perception:

> Our research would have been enhanced by the inclusion of the students' perspectives in the data and future research is warranted about the student learning and pedagogical implications of their involvement in implementing the MD programme. A longitudinal study, particularly in relation to tracking any attitudinal changes for staff would be worthwhile. (Murray, Gilbert-Hunt, Berndt, & Perrelle, 2016, p. 627)

In the present study, beside the third-year students involved in the selection and development of the cognitive stimulation sessions, four students of the fourth and final year of the Occupational Therapy undergraduate programme, of the School of Health Sciences of the

Polytechnic of Leiria (ESSLei) acted as researchers within the Applied Research Curricular Unit. It was observed the double involvement of students (as participants in the selection and development of the cognitive stimulation sessions and as a research team member) with verifiable gains in the pedagogical process that included research competences. In this context, it was intended to answer the research question: In the perception of students and lecturers of Occupational Therapy, to what extent does participation in research projects contribute for student's pedagogical and scientific development? "

The main goal of the present study was to understand the participants' perception of pedagogical and scientific gains of students after being actively involved in carrying out a research project. The third-year students assumed the role of specialists and had to carry out two complementary tasks. The first task consisted in critically analysing a set of sessions included in the CSP and secondly, to outline a session that could be applied in digital format with the elderly population with Light Cognitive Decline (LCD).

Therefore, procedures considered relevant to the collection of information were developed with the students (focus group and questionnaire) and with the lecturers (semi-structured interview) who streamlined and supervised them during the requested assignment at ESSLei.

LCD is a condition that consists of a state of transition between the cognitive changes that are part of normal ageing and the first symptoms of dementia, characterized by the loss of cognitive abilities that occur in a proportion greater than that expected for the age (Muñoz, et al., 2017). The early diagnosis of this condition is extremely important, thus allowing immediate intervention in order to prevent the appearance of dementia (Ikeda, Lemos, & Besse, 2014). The practice of mental exercises is an obvious intervention to improve or at least preserve the functioning of certain cognitive functions, being a non-invasive and non-pharmacological therapy that prevents cognitive decline. In this sense, it is verified that the Cognitive Stimulation is the involvement of the individual in activities that promote the global cognitive functioning, usually, in group (Buschert, Hampel, & Bokde, 2010).

Therefore, the added significance of this work is assumed, not only for the development of an effective cognitive intervention, but also for the involvement of students as specialists and researchers in this process, with the inherent advantages for all involved.

By reading this paper, it will be possible to verify the reference framework and the state of the art on the subject, as well as all the procedures for collecting and interpreting the data, balancing the contributions to the training of future occupational therapists.

Ethical Procedures

For all data collection and subsequent disclosure, prior approval from the National Data Protection Commission and from the Ethics Committee of the Nursing School of Coimbra was requested. The study was also explained to the participants, and the parties involved signed an informed consent.

Methods

The present study, with a descriptive-exploratory purpose, presents a qualitative approach, since it seeks to understand and interpret phenomena based on the meaning attributed by the participants, describing the students' perception of their involvement in the development of CSP.

With regard to research design, it is a case study, since an in-depth analysis of a problem was carried out in its natural environment (Oliveira, Barros, & Silva, 2016).

A case study is particularly useful in this research because there is a need to obtain an in-depth appreciation of a problem, event or phenomenon of interest, in a natural environment and real-life context. It is intended to capture the particularity and complexity of a case that is here consubstantiated in an active learning strategy on cognitive stimulation in the lecture room, with third-year Occupational Therapy students. It is a whole range of procedures based on an archetype that seeks deep understanding and is embodied in data that emerge from rigorously conducted methods and techniques (Ribeiro, Brandão, & Costa, 2016).

This case study is classified as a single case study, since, according to Yin (2014), it was aimed to determine the truth of the propositions of a rare or extreme theory, that is, there are not many similar situations for comparative studies, thus presenting innovative information. Yin (2014) also states that the type of study is characterised by the number of cases subject to analysis, with this assumption, the present research refers to a single case—the participation in a research project as an active learning method. The set of participants were intentionally selected, consisting of third-year students and a lecturer of the OT undergraduate programme, involved in the development of the CSP, integrated in a Curricular Unit that addresses principles of OT's assessment and intervention with the elderly.

The data was collected through a semi-structured interview with the lecturer, a focus group with nine students (key informants - workgroup delegates) and a digital questionnaire survey, completed by 31 OT students. The use of different instruments makes it possible to cross-reference and compile different perspectives of the participants, which are essential aspects for the later comprehension of the data triangulation and confirmation of the process validity (Coutinho, 2011). Yin (2014) points out that the methodological procedures of the case study present, as main feature, the use of different methods of data collection, allowing its triangulation. Hence, it was possible to confirm the data among the sources, increasing the consistency and credibility of the analysed information, allowing to obtain "certainty that the researcher presents the phenomenon in a precise way" (Oliveira, Barros, & Silva, 2016, p. 150).

The preference for the semi-structured interview with the lecturer is due to its flexibility, allowing the interviewer to explore, clarify or reformulate the questions, so that the interviewee understands the question and is able to obtain concrete information. Therefore, it was a relevant option, since it was possible to collect richer information and obtain a more abundant volume of diversified data. Consequently, the interview permitted the comprehension of the work completed by the lecturer, the difficulties experienced during the process and her perception about the students' engagement in these projects, especially on acquired pedagogical and scientific contributions. This interview also contributed to the preparation of the focus group held with students, in order to contextualize the work and the need for their collaboration in the Mind & Gait project.

The focus group consisted of nine participants (an element of each of the groups formed during the tasks developed in classroom), with the goal of understanding the perspective on the participation in the development of the CSP and in research projects, aiming to understand if there were contributions to their knowledge. This method was considered the most appropriate since it was possible to collect the data of a representative sample of the class, taking advantage of the interactions between the elements and optimising data collection. Concomitantly, given that the topic was in everyone's interest, the focus group allowed dialogue among members, creating a nonthreatening and more motivating environment for each to state their opinion on the subjects discussed (Kruger & Casey, 2015).

In order to complement the data, it was considered appropriate to disseminate an online questionnaire to all third-year OT students. This instrument allowed a broader view of opinions, namely on: difficulties experienced during the work/tasks developed throughout the study; the contributions to the development of their knowledge in the area of cognitive stimulation; the gains for OT; the importance of students' involvement in research projects; and the advantages

and disadvantages of their participation in this project. The use of this method is due to the strengths it presents, such as the objectivity of the questions, the efficiency in collecting data with large numbers of participants and the ease in data processing, since the questionnaire is mostly comprised of closed or short answer questions (Ribeiro, 2012).

To ensure the validity of the instruments used, the semi-structured interview, the focus group and the questionnaire scripts were analysed and scrutinised regarding the applicability to the respondent, ease of use and the adequacy to the dimensions measured. For this purpose, a specialist carried out the validation of the data collection methods, and in the case of the questionnaire, it was requested to fourth year students to test it, due to their similarity with the target population.

Finding an extensive amount of data is necessary to synthesise information from the raw state (common and subjective) to the comprehensible, interpretive and critical state (Chaves, Mafra, & Larocca, 2015). Hence, the data processing was based on the Content Analysis proposed by Bardin as a technique for interpreting the message through the subjective, systematic and quantitative description of the manifest content (Bardin, 2008).

What is meant by this technique, in general terms, is to "arrange" in an organized, systematic, quantified as much as possible group of categories of signification the "manifest content" of the focus group and the open-ended answers of the questionnaire, in order to be able to interpret them considering the diverse factors that led to its production (Costa & Amado, 2018).

Under this perspective, the analysis was carried out in three phases: pre-analysis, material exploration and treatment of results. In the first phase, all the documents intended to be used were transcribed (verbatim transcription of the semi-structured interview and the focus group) and answers were extracted from the questionnaire. A floating reading of all the sources was carried out, in order to perceive which information could answer the research question. Subsequently, the material was explored, and the information considered relevant was coded according to its content, establishing categories and subcategories. In this phase, three sub phases were employed: clipping—choosing the units of analysis related to the perception and opinion of students and lecturer; enumeration—selection of the coding rules and counting of the registry units; and classification and aggregation—in which the specific categories were determined. The inductive method was used, since there is inference from patterns found in the data, instead of collecting data to prove theories or verify hypotheses (Bardin, 2008).

Some categories were previously defined considering the research question and during the process of construction of the instruments, but most emerged throughout the analysis of the data. In order to make this process more productive and less exhaustive, webQDA software was used. WebQDA software is an online application where the researcher edits, interconnects and organises the documents with the information to be processed. Following, categories and sub-categories were restructured to draw conclusions and to answer the previously asked research question (Neri de Souza, Costa, & Moreira, 2011). The data were codified upon the principles of: 1) homogeneity of categorised information; 2) completeness of the text; 3) exclusivity between codified content; 4) objectivity of the text; and 5) pertinence of the categories and text to the objectives (Amado, 2017; Bardin, 2008). Its validation was feasible due to the sharing of information, discussion and consensus reaching among the group of five researchers (intercoder agreement). This last procedure meets several authors perspectives that agree that collaboration in the coding process enhances structure, clarity and transparency (Cornish, Gillespie, & Zittoun, 2013; Hall, Long, Bermbach, Jordan, & Patterson, 2005; Nielsen, 2016).

Presentation and Discussion of Results

After categorising the acquired data and coding it into context and registration units, four categories more relevant to the study have emerged (Table 1).

Table 1 presents the references for the coding rules of the different participants' discourse, regarding difficulties, contributions to the formation of OT, student behaviour, and teaching and learning methodology, which portrays students' and lecturer's perception of their involvement in research projects.

Table 1: Content Analysis via WebQDA

Category	Subcategory	References in the participants' discourse regarding:	References	Sources
Difficulties Mention of the difficulties experienced by the students during the accomplishment of the activities for the scientific research project.	Understanding instructions	Difficulties experienced by students in carrying out the activity related to what was intended	15	2
	Teamwork	Difficulties in group work, regarding the lack of consensus due to different perspectives in the interpretation of the tasks	7	2
	Number of students working	Excessive number of students in the classroom to work in groups	2	1
	Understanding the usefulness of the activity	Difficulties in understanding the usefulness of sessions	15	2
	Clinical reasoning	Difficulties in clinical reasoning in cognitive stimulation (including structuring of sessions)	24	5
	Little knowledge of the scientific process	Students' lack of knowledge of the scientific process	3	3
	Little knowledge of cognitive stimulation	Little knowledge in the area of cognitive stimulation	3	2
	Lack of information about the target population	Not enough information on the specific characteristics of the target population provided by the project	15	4
Contributions to the training of the Occupational Therapist Mention of the contributions felt by students regarding participation in the scientific research project	Pedagogical contributions	Contributions in the process of teaching and learning in cognitive stimulation	34	6
	Contributions to personal development	Contributions for the personal development of students in participating in a research project	4	3
	Contributions to the knowledge of the research process	Scientific contributions for students in participating in a research project	8	4
	Scientific knowledge on cognitive stimulation	Scientific knowledge in the area of cognitive stimulation - Evidence-Based Practice	46	7
	Development of the capacity for critical analysis	Critical thinking by students in the tasks	20	6
	Clinical reasoning	Contributions to the development of clinical	85	7

Category	Subcategory	References in the participants' discourse regarding:	References	Sources
		thinking in cognitive stimulation (including session structuring)		
	Teamwork	Contributions of teamwork in Occupational Therapy and other areas	9	4
	Occupational Therapy Recognition	Contributions for the dissemination and recognition of the profession	22	3
Students' behaviour Mention the different types of student behaviour observed during the accomplishment of the activities for the project.	Proactivity	Contributions for the dissemination and recognition of the profession	4	3
	Need for recognition	Need for recognition of student work	6	4
Teaching and learning methodology Mention of the teaching and learning methods used throughout the activities for the project.	Incentive by the lecturer	Lecturer's Motivational Speech	7	2
	Evaluation methodology Influence	Stimulation of participation by the compulsory evaluation	5	2
	Class Dynamics	Class dynamisation	10	3
	Number of students	Number of students in the classroom to carry out the activity	2	1
	Previously taught contents	Importance of previously taught contents related to the activity	9	4
	Project Team Support	Support provided by the project team to the teacher	2	1

Difficulties

The results infer that research can be an opportunity for the development of professionals with reflexive, critical and scientific thinking, capable of questioning the knowledge acquired and creating new constructs. However, immersion in the never-ending investigative territory creates difficulties for students in understanding the process and obstacles such as the lack of theoretical and practical knowledge about the methodological procedures necessary for a successful investigation process (Durante & Pereira, 2016).

From the data analysis performed, several subcategories were found referring to the difficulties experienced by the students. One first subcategory was **"Understanding instructions."** Students from the focus group reported that they had difficulties understanding the table (the working document), expressing that "The table was confusing" and "*there were some activities of the script we did not understand what was expected."* In the questionnaire the students also mentioned difficulties in the "*interpretation of some activities and the table*," because the "*writing of some sessions was not very explicit*." With the above it can be seen that understanding instructions requires an external mental representation of the problem, which is often a difficult task for students. The instructions may contain inaccuracies and ambiguities that make difficult the construction of mental models, even with the use of figures/schemes associated with these instructions (Costa & Moreira, 2001).

Another subcategory related to the difficulties was **"Teamwork,"** where students in the focus group indicated that the "*major difficulty was to reach consensus on the scores to be given to each parameter*." In the questionnaire they indicated that "*there were many activities and, within the same group members, there were several interpretations*." Although there are many benefits, it seems inevitable that several problems occur when working in a group (Pfaff & Huddleston, 2003). Common knowledge shows that when working as a team conflicts and worries arise, generated by difficulties in the process of communication, coordination and other factors related to trust, mutual understanding and cohesion (Hidayanto & Setyady, 2014). It can be considered normal to face challenges in group work with students from diverse backgrounds working with each other (Gordon & Connor, 2013).

A third subcategory that roused was the **"Number of Students working,"** in which only references were made by the lecturer during the interview, about the difficulties in working with a large group of students "*having to work with a whole class, having to manage the group was difficult*." It can be seen that when there is a large group, there is an increased difficulty in the work of the lecturer, since it becomes more difficult to develop a relation of proximity with the student, not being able to clarify all the doubts, being that the lecturer's presence becomes hidden in the setting (Bariani & Pavani, 2008).

The subcategory **"Understanding the usefulness of the activity"** also emerged from patterns in the data. Statements can be found, from students of the focus group, who report that "*difficulty in understanding the need and importance of the activity*" and in the questionnaire survey they also considered that "*this activity was not very relevant to the development of my knowledge*."

Much has been said about students taking control of their learning, being active in knowledge seeking. However, learning is very associated with motivation and expectations of the students related to their learning path, and effectively there is a gap between student's expectations and the faculty's and university manager's perceptions (Borghi, Mainardes, & Silva, 2016; Kandiko & Mawer, 2013; Mainardes, Raposo, & Alves, 2013). Without wanting to address expectations about higher education, whereas relevant studies were already made, it is important to emphasise the perceived contribution of educational activities to the professional training of students. Students have expectations that they will participate in the process of building knowledge, including activities/contents relevant to their degree and, consequently, enhance their future professional practice and integration in the labour market. They believe that by taking part in practical and theoretical classes, as well in research projects, will increase their success in their future professional life (Borghi, Mainardes, & Silva, 2016; Mainardes, Raposo, & Alves, 2013). Hence, the data in this category came to the point of Ribeiro (2011), which indicates that many teachers put the students' alleged lack of motivation as the first obstacle to the understanding and learning of school contents. Nevertheless, teachers should ask students to question, explain and contribute for activities' usefulness, in order to keep aware and motivated.

"Clinical Reasoning" surfaced both in the difficulties as well as in the contributions in OT training and was the topic with the highest number of references. It appeared first from the focus group, where "*difficulties in clinical reasoning*" and difficulty "*in understanding if that dimension was worked in that activity*" were mentioned as hardship by the students. In the questionnaire was also referenced that it was difficult "*to understand the aims of some activities*" and "*to understand which could be adapted to digital format*." The latter statement indicates difficulties in prospecting, analysing and constructing an activity in a differentiated format that fulfils its intended goals. Using activity as a therapeutic tool is one core skill of an Occupational Therapist and involves "*using activity analysis, synthesis, adaptation, grading and sequencing to transform everyday activities into interventions*" (Bryant, Fieldhouse, & Banningan, 2014, p. 54). Therefore, it can't be neglected and should be of concern if difficulties

overcome performance. There is a need for OT intervention to seize and monetize the potential of currently existing modern means as technological tools for cognitive stimulation and should be integrated into the skills profile to be acquired by the student. Clinical competence means being able to mobilise knowledge, information, rules and values, in a correct and timely manner in favour of good decision. Such competence is acquired as a consequence of learning arising from reflective experience, decision-making and problem solving (Gontijo, Alvim, Megale, Melo, & Lima, 2013). Under these circumstances, need arises to provide more opportunities for students to develop clinical reasoning before beginning their practice, to enable higher performance in activities (Célia, Gordan, & Garanhani, 2011).

Another category that reflects the difficulties experienced is the "**Little knowledge of the scientific process**" being mentioned in the interview with the lecturer that "*of course in the third year they still do not have a concept or can understand the component of the research projects*" and the students , in the focus group, do not understand the greatness of the project, that is, they have no idea of the work involved in a research project and, finally, in the questionnaire, students reported having little knowledge about the area. It is, therefore, important that scientific research be present in several areas, since it will be through research that knowledge will be constructed and deconstructed, theories will be grounded, accepted or refuted and problems will be solved (Durante & Pereira, 2016).

A subcategory was also codified referring to the **"Lack of information about the target population**," which the students referred as a difficulty to carry out their task. During the focus group several students reported, "*we had the audience, who were elderly, but we did not know?? what difficulties they presented*"; the questionnaire also refers to the lack of information about the specific target population. It seems, there was a difficulty for students in extrapolating the sessions for a more general audience suffering from mild cognitive decline. It sounds unusual, given the age and academic progress of students, this need for something concrete, instead of the recollection of previously learned knowledge, leading to uncertainties regarding previous input and accommodation of information.

Finally, the last subcategory referring to difficulties is the "**Little knowledge about cognitive stimulation**" given by the students, in the focus group: "*difficulties in understanding the definitions of domains presented in the given script, because they differed from those learned in class*." Still, in the questionnaire, the students referred to the lack of "*some skills and knowledge in the area of cognitive domains*" and that, for this reason, "*there is always the risk of errors of analysis and adaptation (...) due to inexperience*." This could be justified as students are still in a phase of searching for knowledge, requiring guidance and supervision by teachers in order to put into practice the theoretical constructs learned (Murray, Gilbert-Hunt, Berndt, & Perrelle, 2016).

Contributions to the Training of the Occupational Therapist

The involvement of students in research projects allows articulating theory and practice, both essential in professional practice (Leite & Arez, 2011). Students acquire theoretical-methodological bases, clinical experiences and technical abilities when participating in research projects (Carlo, Santana, Elui, & Castro, 2009).

From the data analysis performed, several subcategories emerged regarding the "**Contributions to the training of the Occupational Therapist**" such as the "**Development of the capacity for critical analysis"** in which the lecturer refers, in the interview, to the critical inquiry showed by students; in the focus group, the students suggested that "(...) *there should be prerequisites*." Finally, it was also mentioned in the questionnaire that the activities carried out allowed "*to develop my critical capacity*." Reflective thinking is an essential competence in health students; it develops when the student is challenged with certain

situations and new problems, promoting reflexive conversations that contribute to a better understanding and exchange of knowledge, decision making and the development of critical analysis capacity (Borges & Alencar, 2014).

The subcategory **"Pedagogical contributions"** contains references made by the lecturer during the interview, stating that this teaching-learning method allows to create a relation with contents taught "*The activities carried out in the project allowed to bridge the curricular unit in question."* In the focus group and in the questionnaire, the students agree with what was said by the lecturer, stating that the activity carried out within the scope of the project allows the consolidation and deepening of the subject taught "*This type of participation allows us to put into practice what we are learning*." Activities that bring the student closer to the professional practice provide meaningful learning, knowledge building, skills and attitudes, with autonomy and responsibility (Paranhos & Mendes, 2010).

"Clinical reasoning" was repeated as a subcategory, but for better reasons. The lecturer referenced in the interview, that the tasks promoted the development of activities adaptation according to the needs of each user. It was mentioned by the students in the focus group that "*it was important to work out the reasoning*" and in the questionnaire it can be seen that "*it allowed a more detailed analysis of the activity*." The involvement of students in new challenges allows the development of clinical reasoning (Célia, Gordan, & Garanhani, 2011). Furthermore, as Gontijo et al. (2013) argue, skills are acquired as a consequence of learning from reflective experience, decision making and problem solving, according to the ability to: adapt to the uniqueness of the problem to be solved; mobilise the stock of available cognitive resources; experience practical situations to learn to decide and act correctly with sufficient safety, speed and tranquillity. In this manner, the activity put into practice endorsed an evolution in the capacity for analysis, evaluation, reflection, creativity, prediction, discrimination, perseverance, flexibility, knowledge transfer and trust (Corker, Garnett, Hill, Bramhal, & Gray, 2012).

The subcategory **"Recognition of Occupational Therapy"** includes references made by students in the focus group and in questionnaire about the importance of carrying out these projects to promote the profession, stating "*we can contribute for our profession to evolve*" and "publicize Occupational Therapy and in what areas it can intervene."

In the subcategory "**Contributions to the knowledge of the research process**," it is referenced in the interview by the lecturer that the students "*have already begun working the scientific component*," and even they, in the focus group, affirm that "*we have developed our knowledge*." In the questionnaire it can be read that "*understanding how a project works*" and "*acquiring knowledge*" becomes very beneficial. In higher education, research activities play a central role in student development, insofar as it generates knowledge about the research process and reinforces the importance of scientific evidence to sustain the practice. Correspondingly, it allows the student to acquire the ability to transmit knowledge and eventually incorporate the research community and integrate research projects (Frade, Chora, Marques, & Sim-Sim, 2013).

In the subcategory **"Scientific knowledge on cognitive stimulation,"** the lecturer refers to contributions regarding the increase of the student's knowledge, inasmuch as "*It contributed very, very much, because the subject in which the work was integrated was Occupational Therapy III*." Also, the students refer in the focus group and, in the questionnaire, the benefits to increase the knowledge in this area. Here, recalls to Evidence-Based Practice (EBP) as a "*procedure whereby clinicians incorporate best research evidence, clinical expertise, and patient values, resulting in the presentation of the most appropriate and efficient services to their patients"* (Upton, Stephens, Williams, & Evans-Scurlock, 2014, p. 77). It is not too much to reinforce that Occupational Therapy is a profession that emphasises the

importance of implementing EBP in order to ensure quality on the delivery of health care (Upton, Stephens, Williams, & Evans-Scurlock, 2014).

The subcategory "**Teamwork**" is also repeated as an advantage of the carried-out learning methods. Students report that "it *is important to start working in interdisciplinary and multidisciplinary teams to prepare for practice*," contributing to "*learning to work as a team*" and "*to understand professionals from other areas*." The inquired students most value the question of future working relationships. However, it is usual for students to associate teamwork in two categories: (i) students view the team as a means to getting the assigned task completed as efficiently as possible and (ii) students perceive the team as a means to advance their individual and collective knowledge (Volkov & Volkov, 2015). Teamwork is an active process of exchange and knowledge production, and it is fundamental to promote this method of work in higher education classes, to create an environment of reflection and discussion (Borges & Alencar, 2014).

In the subcategory **"Contributions for personal development"** there are references present given by the lecturer to the extent that "*there was a process of maturity of the students*." In the questionnaire, students report that there was a promotion of personal skills. The introduction to scientific research in higher education is an important opportunity for students to develop their personal, academic and professional skills (Pinto, Fernandes, & Silva, 2016).

Student Behavior

Throughout the undergraduate programme and the challenges it promotes, the student adopts an "*active, conscious, responsible, critical, creative, socially committed*" behaviour and needs to be "*increasingly reflective and active in the spaces of teaching, learning to care in health*" (Jacondino, Silveira, Martins, & Coimbra, 2015, p. 33).

From the data analysis, we obtained the subcategory "**Proactivity**," raised by the lecturer, in which she affirmed that "*their participation was active*" and the students "*made a point of participating because it is important*" contributing to "*research more about the subject*." Proactivity is a comprehensive concept, which includes the ability and initiative to seek solving and anticipating problems with insight (Aguiar, Ferreira, & Garcia, 2010). The involvement of higher education students in research projects stimulates creativity and proactivity, promoting a constant search and research by the student (Pinto, Fernandes, & Silva, 2016).

The second subcategory that emerged was the "**Need for Recognition**" on the part of the students, referenced by the lecturer, which wasn´t expected. The students were "*always concerned about the merit and recognition they were going to receive and if they were going to receive*," and they were "*preoccupied that someone would come to school to thank them*." In the focus group, the students stated that it is important to participate in scientific projects because "*if implemented, if there are visible results*" they could declare "*I was part of it, and it is good to see our work recognised*." Concurrently, it was mentioned in the questionnaire that they had to "*feel involved and valued*" and have "*some visibility*." This need for recognition emerges from an extrinsic motivation to perform a task to obtain something external to one's own, for example getting good grades, feeling socially valued, or obtaining a material reward (Machado & Alves, 2013).

Teaching and Learning Methodology

As it has already been said, student motivation plays an important role in the learning process. Projects can contribute to the improvement of the teaching-learning process and to stimulate the research culture (Machado & Alves, 2013).

In the subcategory "**Number of students working**," the lecturer comments on the influence of the number of students in the lecture room to develop the activities, stating that "it was necessary to work in smaller groups ... it was much more advantageous and much more productive, and work came out in a lot more quantity (...) the management of work was totally different." The fact that the class is divided in groups allows greater adherence to the accomplishment of the activities, but also allows a better teacher-student relationship (Bariani & Pavani, 2008). Research studies confirm that students prefer to work in smaller classes and these are associated with better classroom climate, higher level cognitive skills and critical thinking, increased engagement, better achievement and performance and, correspondingly, even with better grades (Gibbs, & Jenkins, 2013; Maringe & Sing, 2014; Mulryan-Kyne, 2010).

The second subcategory "**Contents previously taught**" has some lecturer's references during the interview, stating that the curricular unit "is delineated and fully programmed for ageing" and states that "Occupational Therapy III developed more theoretical knowledge, but then Analysis III had a more practical component (...) that was very facilitator." The students also addressed this aspect, in the focus group and the questionnaire, maintaining that "we already know what it is that the elderly at this point begin to lose and the capacities that are beginning to be affected" and "We were already familiar with this type of activity," which "allowed us to recruit all the theoretical knowledge acquired in the classroom." The knowledge acquired previously in the classroom becomes essential for a good conduction of the interventional project. The students can use these previously taught contents and use them to practice (Moreira & Ribeiro, 2016). Likewise, the research of Ordóñez-Sierra and Rodríguez-Gallego (2015) also unearthed that students do value that the activities put into practice the theories studied.

The third subcategory that emerged from the data was **"Project Team Support,"** an aspect referenced only by the lecturer during the interview. According to the lecturer, "there was this management and, of course, this concern and this only happened because it hears an articulation also with the research team." Collaboration in teaching is an important work strategy as it provides better teaching practices (Lobo & Bastos, 2015). When lecturers and researchers act as collaborators engaged in educational research, studies of teaching and learning may reflect a broader set of voices, ideas, and perspectives. Through collaborative work and dialogue, practitioners and researchers can build more robust educational theories and practices, benefiting those who need it most, the students (Christianakis, 2010).

In "**Class Dynamics**," references from lecturer were found, affirming that "this type of work has a great advantage in the dynamization of active work within the classroom." The students, on this topic, refer in the focus group and in the questionnaire that "We liked, but ... there should be more organisation," stating that "the orders that were given changed many times," there being a "constant deadline change" and "little time to perform and few clarifications about the doubts." Nonetheless, "whenever the lecturer changed something, she apologised and explained why." In order to have academic achievement it is necessary that there is a good time management in the classroom. Despite lecturers' efforts, there are often constraints in the classroom dynamics due to less well-planned, unplanned events, and less-trained class dynamics (Puentes & Aquino, 2008). The previous researchers state that more than 90% of the lecturers interviewed considered that they do not plan, or that they plan insufficiently, the content management in their subject. As a consequence, there are losses on the expected time for students to perform different activities during classes (Puentes & Aquino, 2008). In the different school levels, it is seen that the lecturer time management is directly proportioned with the performance of students (Sahito, Khawaja, Panhwar, Siddiqui, & Saeed, 2016).

There are several reasons associated, but constant complaints of work overload are on top. Therefore, it seems necessary that the institution rigorously plan the school calendar, in

the most correct and systematic way, in order to manage the time spent by students and teachers in academic activities (Puentes & Aquino, 2008).

In the subcategory, "**Incentive by the lecturer**," the lecturer states that "I was always encouraging and telling them the importance of the project in the academic and scientific world and that their collaboration was very important" and that "whenever I received the emails of the project team I made sure to inform that the activities that were being analysed would be put into practice, so students wouldn't think that it was only in paper." Similarly, Ordóñez-Sierra and Rodríguez-Gallego (2015) also found that student value the scientific and practical significance of learning activities. In this sense, it is important to raise awareness of the scientific value and professional usefulness of the activities developed for their professional training (Ordóñez-Sierra & Rodríguez-Gallego, 2015). In the focus group, the students reinforced the support of the lecturer "the lecturer gave us feedback on the sessions planned by the groups." Motivation, as mentioned above, on the other hand, promotes a greater performance of the students, because in addition to being motivated, they feel supported and surrounded by a stimulating environment that strengthens learning (Célia, Gordan, & Garanhani, 2011).

One last subcategory analysed was entitled **"Influence of the evaluation methodology."** In this, it is referenced in the interview with the lecturer, that the first activity "it was all in the evaluation methodology, and so everyone ended up participating," however in the second activity, which "was not within the evaluation methodology ... I had to ask them to participate voluntarily in the activity. It was very complicated because it was not within the evaluation methodology." The lecturer concluded that "it was interesting that this participation was active and not necessarily mandatory to be within an evaluation methodology ...." In the focus group with the students, they said that "the second activity they did was voluntary and that there were fewer groups doing it." Student motivation is influenced by an outside reward for the task, for example getting good grades. Given this, extrinsic motivation can be useful for academic activities, supporting less pleasant activities (Machado & Alves, 2013). In the other hand, Turner and Baskerville (2011, p. 21) sustain that "Once they engaged in the assessed learning tasks, they found them to be interesting, arousing their curiosity, developing a sense of expectation and causing them to ask their own questions and to seek answers to these questions."

Final Considerations

Answering the question "In the perception of students and lecturers of Occupational Therapy, to what extent does participation in research projects contribute for student's pedagogical and scientific development?" it is assumed that there were large contributions for students of the third-year of the undergraduate programme in Occupational Therapy, mainly, pedagogical and scientific, in the area of cognitive stimulation, as well as in the development of clinical reasoning. However, there have been other contributions, notably in terms of personal development, knowledge of the scientific process, capacity for critical analysis, and teamwork. Participation in research projects is generally considered to be a positive experience for students, since it allows them to acquire diverse skills, particularly autonomy and proactivity (Pinto, Fernandes, & Silva, 2016).

The development of the clinical reasoning was the contribution most referenced by the students, however, throughout the work process, was the biggest difficulty felt, due to the factors referenced previously. In addition to the difficulties in clinical reasoning, there were others that may have been obstacles to the development of the proposed activities: understanding the instructions, lack of information about the target population and

understanding the usefulness of the activity. These difficulties proved to be a disaffect factor for students.

Regarding the teaching-learning method used by the lecturer, in the classroom, the students pointed out as main negative points the dynamics, organisation and management of work, as well as the time previously established. As a way of preventing obstacles to the development of future projects, the pre-preparation and management of classes by lecturers are mandatory, in order to obtain a more organised and productive work (Moura & Barbosa, 2014). However, they emphasise the importance of being taught classes in advance, in which they approached contents related to the theme of the project. This became an important milestone for the students to acquire the necessary knowledge to carry out the proposed activities, putting into practice the contents previously taught.

It is understood that the compulsory evaluation and the incentive given by the lecturer were preponderant aspects to stimulate the participation of the students, and afterwards a change of behaviour. In addition to these factors, the motivation for their participation also arose from the recognition that the students could receive from the project team and other teachers involved. In this way, it may become important to create and promote new strategies to motivate and involve students in more research work during the degree, strengthening and grounding the active learning methodologies that have been adopted by the institutions.

It was noted that the students recognised their involvement in this project as a differentiated and engaging teaching-learning process, and that this activity played an active role in their personal growth, making them more critical and reflective. In this way, scientific initiation is a process of learning and developing skills for students, providing research in different areas, as well as being an opportunity to awaken interest in the scientific area in young people (Pinto, Fernandes, & Silva, 2016).

The use of the Problem and Project-Based Learning methodology gives the student a practical involvement in research projects, allowing for the development of knowledge in several areas and preparation for involvement in future research. Thus, it would be pertinent for research to be more integrated into teaching methodologies, so that the student becomes aware of the dimension and importance for their training and future professional practice.

Finally, we consider the need for research on students' perceptions of the impact of the evaluation requirement for their participation in research projects; and perceptions of Occupational Therapy students about the use of active learning methodologies in their initial training.

The present study could be enhanced by involving students from other schools and by conducting a follow up to assess maintenance of acquired skills.

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