



ANALYSIS OF THE TRAINING OF ERGONOMICS TEACHERS ON PRODUCTION ENGINEERING COURSES

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Abstract: Training teachers for higher education is a challenging task, demanding in addition to knowledge of the subject, teaching skills and an effective relationship with students. However, preparation for this profession is often deficient, as most university courses do not offer specific teaching and teaching subjects. This gap is reflected in postgraduate studies, where in-depth knowledge of teaching practices is scarce. This is particularly problematic in interdisciplinary areas, such as ergonomics, where teachers may not be familiar with essential knowledge in the field. The lack of clear guidelines for the training of ergonomics teachers leads to a limited reproduction of prior academic knowledge.

The Brazilian Ergonomics Association and the International Ergonomics Association seek to standardize the knowledge and skills necessary for ergonomists. However, certification in the field is not yet a requirement for teaching. Furthermore, teacher training in ergonomics is often not specific or comprehensive enough, as undergraduate courses in related disciplines may not provide a solid foundation. A lack of teacher preparation can result in a negligent approach to ergonomics, especially in areas such as production engineering, where the focus on productivity often obscures the importance of worker well-being.

To investigate this issue, a qualitative-quantitative research was carried out to analyze the training of ergonomics teachers in Brazil. Teachers' training at different academic levels and areas of knowledge were considered, as well as the geographic distribution of production engineering courses that offer ergonomics subjects. The results highlighted the need for improvements in training and recognition of the importance of ergonomics in higher education.

Keywords: Teacher training; Engineering Education; Human Factors; Curriculum.

Introduction

The training of a higher education teacher is complex. In addition to the knowledge taught to students, the teacher needs to have a command of didactics and pedagogical practices and a good relationship with the class (MARTIN; ROMANOWSKI, 2010; LIBÂNEO, 2015; GATTI, 2017). It is challenging to qualify for this profession, as most university courses do not have undergraduate and teaching subjects, leaving the teacher's responsibility for in-depth study during postgraduate studies.

Improvement in undergraduate concepts and practices does not always occur in master's and doctoral courses. Disciplines linked to teaching-learning that demonstrate practices and reflections on the preparation of a class, student-teacher interaction and the way in which teaching and assessment are rare are rare (CORRÊA; RIBEIRO, 2013; SANTOS; GIASSON, 2019; MONTEIRO et al., 2020). At various times, this is the responsibility of only teaching internship subjects, which do not have a standard to follow nor an essential programmatic content (ROCHA-DE-OLIVEIRA; DELUCA, 2017; RODRIGUES et al., 2022).

This becomes a bigger problem in areas that do not have a specific degree, such as ergonomics. This is an interdisciplinary area by concept, using different sciences to build its main knowledge. Ergonomics as a science derives from areas of health, engineering, applied social, humanities and linguistics (DUL et al., 2012). This fact makes different concepts essential to be taught during the training of a professional in this area due to the diversity of knowledge and the interdisciplinarity proposed by this theme (SILVA; BIFANO, 2020).

The Brazilian Ergonomics Association (ABERGO) strives to direct and standardize knowledge, skills and assessment for this profession in Brazil, in the same way that the International Ergonomics Association (IEA) achieves this objective worldwide. . The essential knowledge for an ergonomics professional is described by different documents, such as the Core Competences in Human Factors and Ergonomics (IEA, 2021) and Brazilian Ergonomics Standards, such as ERG BR 1001 – Essential Competencies for Certified Ergonomists (ABERGO, 2002) . Still, it is not possible to find in the literature what are the essential contents that an ergonomics teacher should teach in their classes. This creates a practical gap, where teachers do not recognize what is necessary to teach and end up

reproducing what they learned during their academic training, making it necessary to continually monitor and assist them (COURA; PASSOS, 2017; ALVES, 2018) .

The Brazilian Ergonomics Certification System (SisCEB), organized by ABERGO, certifies professionals in the field of ergonomics who wish to work in the job market. Teachers can also obtain this certification, in two different ways: through the National Ergonomics Exam (ENERGO) or by proving their work in the area through the ERG BR Standard (ABERGO, 2017). However, this certification is not yet used to choose the teacher, or as an additional assessment requirement.

Another gap is in the training of this teacher. Ergonomics has interdisciplinary bases and is present in different undergraduate courses, such as architecture, physiotherapy, psychology, design and different engineering areas. After completing a postgraduate degree in areas such as these, it is possible for the professional to become a university professor and teach different students. However, postgraduate courses do not always address these topics with the necessary depth and specificity. Likewise, to teach ergonomics it is not necessary for the teacher to have specialized in this area or in related areas that work on the evaluation of work and worker health.

By analyzing the gap in teacher training, it is also possible to investigate whether there is a lack of knowledge in this teacher's training. During a professional's academic training, different activities can guarantee the development of knowledge: graduation, internship, specialization, master's degree and doctorate. When these are not linked to ergonomics, it is suggested that this teacher's contacts with ergonomics may have been flawed and ineffective. Therefore, the question that remains is whether these teachers are really prepared to teach the subjects.

In the area of production engineering and ergonomics, for example, work like these is scarce, but necessary. The reason for this need is that ergonomics, within production engineering, is a neglected area, with a lack of humanization of this professional in relation to workers (MAZZURCO; DANIEL, 2019) and a lack of understanding of their social responsibility as an engineer (OVIEDO-TRESPALACIOS et al., 2021). In an undergraduate course where we think exhaustively about increasing productivity, optimizing processes and reducing costs, the worker can often be left aside, while he is one of the main elements in achieving these objectives (SMITH, 2007; SAURIN; PATRIARCCA, 2016).

Therefore, studying how teacher training occurs in this environment is essential, so that we can have answers to previous reflections and defenses based on improvements based on adapting the work to the worker. Therefore, the research question of this article is: How was the training of ergonomics teachers and where did this learning take place?

In order for this question to be answered, the present work aimed to analyze the training of ergonomics professors who teach at universities in Brazil. For this, an investigation into the literature, digital platforms and virtual curricula was carried out. In order to define and carry out a better analysis, ergonomics subjects belonging to production engineering courses were considered.

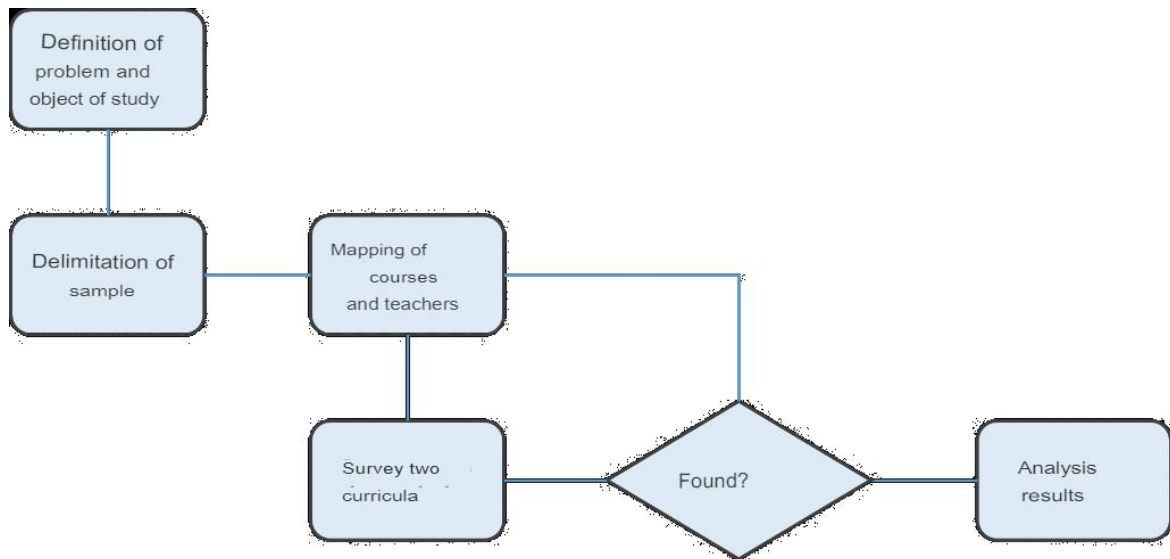
Methodological procedures

This research can be considered as qualitative and quantitative. This research approach is used to explore poorly structured questions, with the aim of characterizing a certain number of factors for which the use has not yet consolidated a scale to measure their performance and, furthermore, using a simple ordinal scale it is possible to carry out the approach (ENSSLIN ; VIANNA, 2008).

This type of study can also be characterized as quantitative-descriptive, by studying the description of a population (LAKATOS; MARCONI, 2003). In this way, the quantitative approach takes place in the count and percentage of data collected and the qualitative approach takes place in the analysis of the relationships between the training of each teacher for each stage of the academic process – undergraduate, specialization, master's and doctorate.

In this sense, an investigation in literature and digital platforms was carried out. This made it possible to survey the state of the art and the reality of the situation, demonstrating how it currently stands and analyzing situations to improve the outlook. The investigation allows the gathering of a number of information, with the aim of working with data about a specific institution or group of investigated subjects (ANDRADE et al., 2010). Figure 1 shows the main stages of the methodological procedures of this research.

Figure 01 – Methodological procedures of the study



After defining the objective and research problem, the first stage began: defining the object of study and the location of the sample. At this stage, we sought to investigate what the main data would be to achieve the objective and where this collection would take place. The ergonomics subjects of production engineering courses at different universities served as the object of study for the research. Thus, at a national level, the Ministry of Education (MEC) portal has a database that shows universities that offer production engineering courses in the country.

So that the sample could be classified and defined, the second step was used: sample delimitation. The work focused on institutions classified as public and private non-profit that have their classes in person. The production engineering courses selected were bachelor's degrees evaluated in the last current National Student Performance Exam (ENADE) with a grade four or five.

The third stage: investigation into university and course platforms was the moment when data began to be collected. For each of the production engineering courses, the institution's website was searched and a tab or profile was found that described the teachers. If this item was not found, the class schedules or subjects related to ergonomics were searched, to observe any indication of who was responsible for teaching the subject. It is worth noting that educational institutions that did not have the necessary information available were excluded from the study sample.

After finding the name of the responsible teachers, the fourth stage: searching for the curriculum to identify the training, began. For this, teachers' data was placed on the Lattes Platform, a virtual CV system created by the National Council for Scientific and

Technological Development (CNPq). In each teacher's Lattes, each teacher's training was identified in the “Academic Training/Title” tab, collecting the four possible levels of training: undergraduate, specialization, master's and doctorate. The location where the training took place was also collected.

When the teachers' names were not found on digital platforms, or the ergonomics subjects were not located along with their syllabus, the strategy adopted was to send an email to the course coordination. Thus, the project was detailed and the reason for contact was described, with each coordinator being asked to send the name of the teacher, their training and the characteristics of the ergonomics discipline of the course (location in the curriculum, workload and programmatic content).

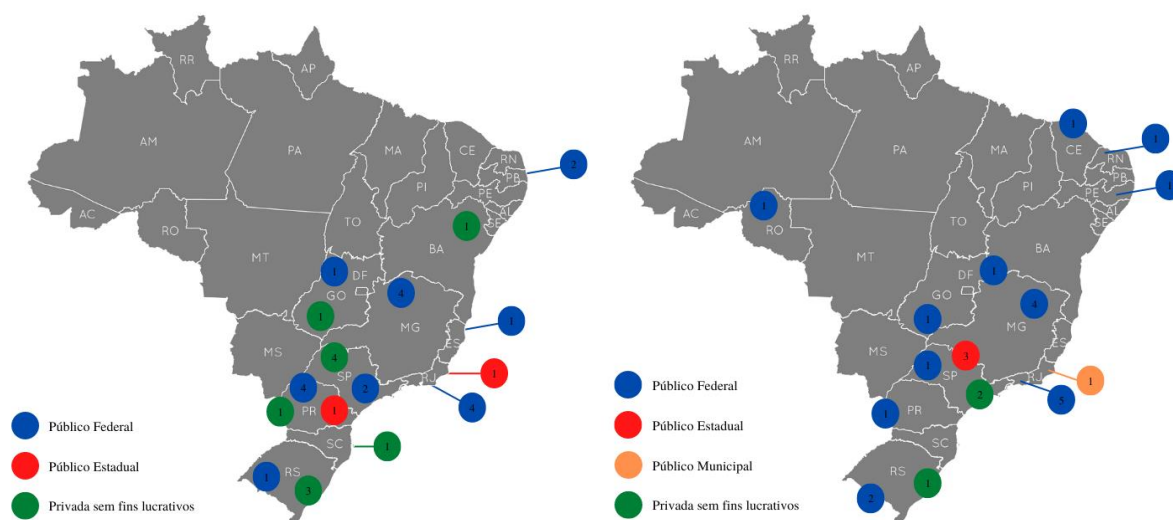
By combining the responses from the fourth stage, the last and fifth stage: descriptive statistical analysis and discussion of the results were carried out. For this, the location of production engineering courses by Brazilian state was mapped, and information from teachers was described in relation to the region of the country, gender, area of knowledge of the four levels of training, place of training and area of the dissertation or thesis. . Afterwards, a temporal analysis of the teachers' training was carried out, that is, what the training was like according to the areas of knowledge and training levels.

Results

The collected results were analyzed using descriptive statistics, counting and corresponding percentages according to the classification. The names of the professors found and their respective universities where they teach were preserved, in order to avoid their identification.

According to the MEC and ENADE database, the number of courses in production engineering is 61 with ENADE 4 concept and 29 with ENADE 5 concept. With the information on the ergonomics discipline made available, the sample for the study was 32 courses with concept 4, approximately 60% of which are from federal public institutions, 34% from state public institutions and 6% from private non-profit institutions. With grade 5, 26 courses were part of the sample. According to the classification of institutions, 73% are federal public institutions, 11.5% state public institutions and 11.5% private non-profit institutions. Furthermore, the existence of a public institution at municipal level was observed.

Figure 02 – Mapping of the production engineering courses in the sample: ENADE 4 (A) and ENADE 5 (B)



In relation to courses rated ENADE 4 by institutions, the North region is the only one without a representative. The Southeast (16) and South (11) regions have the largest number of courses, with the states with the highest concentration of courses being: São Paulo (6) and Paraná (5). The states of Minas Gerais, Paraná and Rio de Janeiro have the largest number (4) of federal public institutions, which corresponds to 63%. On the other hand, the states of São Paulo (36%) and Rio Grande do Sul (27%) have a greater number of private non-profit companies, respectively. The state of Paraná is the only one to have all three classifications of institutions.

All regions have courses with an ENADE 5 concept, with 61% of courses concentrated in the Southeast region. It is possible to verify that federal public institutions are present in all states that contain this course concept. The states of São Paulo and Rio de Janeiro have the largest number (6) of institutions offering the course. Specifically regarding federal public institutions, Rio de Janeiro is the state with the highest number (5), and still has the only municipal institution. The state of São Paulo is the only one that has state public institutions (3).

Table 01 – data collected on the training of ergonomics teachers

		CAPES 5		CAPES 4		Total	
		N	%	N	%	N	%
Number of teachers		28	45,90%	33	54,1%	61	100,00%
Region	Southeast	16	57,14%	17	51,52%	33	54,10%
	South	4	14,29%	11	33,33%	15	24,59%
	Midwest	2	7,14%	2	6,06%	4	6,56%
	North East	5	17,86%	3	9,09%	8	13,11%
	North	1	3,57%	0	0,00%	1	1,64%
Gender	Masculine	16	57,14%	19	57,58%	35	57,38%
	Feminine	12	42,86%	14	42,42%	26	42,62%
Graduation*	production engineering	4	14,29%	10	30,30%	14	22,95%
	Other Engineering	11	39,29%	16	48,48%	27	44,26%
	Exact and Earth Sciences	2	7,14%	2	6,06%	4	6,56%
	Health Sciences	2	7,14%	2	6,06%	4	6,56%
	Agricultural Sciences	2	7,14%	1	3,03%	3	4,92%
	Applied Social Sciences	7	25,00%	4	12,12%	11	18,03%
	Human Sciences	2	7,14%	0	0,00%	2	3,28%
Specialization*	Work's Security Engineer	10	35,71%	10	30,30%	20	32,79%
	Ergonomics	7	25,00%	6	18,18%	13	21,31%
	Engineering	1	3,57%	2	6,06%	3	4,92%
	Other areas of knowledge	5	17,86%	7	21,21%	12	19,67%
	Does not have	8	28,57%	14	42,42%	22	36,07%
Master's degree	Ergonomics	1	3,57%	0	0,00%	1	1,64%
	production engineering	12	42,86%	17	51,52%	29	47,54%
	Other Engineering	6	21,43%	10	30,30%	16	26,23%
	Other areas of knowledge	9	32,14%	5	15,15%	14	22,95%
	Does not have	0	0,00%	1	3,03%	1	1,64%
Doctorate degree	Ergonomics	2	7,14%	1	3,03%	3	4,92%
	production engineering	10	35,71%	16	48,48%	26	42,62%
	Other Engineering	4	14,29%	3	9,09%	7	11,48%
	Other areas of knowledge	9	32,14%	3	9,09%	12	19,67%
	Does not have/In progress	3	10,71%	10	30,30%	13	21,31%
Training location	Ergonomics						
	Brazil	22	78,57%	32	96,97%	54	88,52%
	America	1	3,57%	0	0,00%	1	1,64%
	Europe	5	17,86%	1	3,03%	6	9,84%
Area of the professional's dissertation or thesis	Ergonomics area	13	46,43%	13	39,39%	26	42,62%
	Area related to ergonomics	3	10,71%	2	6,06%	5	8,20%
	Other area	12	42,86%	18	54,55%	30	49,18%

* Total training is greater than the total number of teachers due to the possibility of a teacher having more than 1 course.

After carrying out a descriptive analysis of the location and categories in which universities are found in the MEC, it is possible to carry out a descriptive analysis of the data found. Table 1 presents the respective numbers of the categories surveyed, such as the gender of the teachers, their training - in undergraduate, specialization, master's and doctoral degrees, the place of main training of these teachers and the area in which these professionals carried out their most impactful academic work (dissertation or thesis).

In table 1, some values were highlighted for better understanding. Since it is an analysis of the training of teachers in production engineering courses who teach ergonomics subjects, it is worth highlighting these two training courses at their respective levels. Therefore, it is expected that these teachers have a relationship with these areas, as the concepts that are worked on in the classroom were developed in one of these spheres. It is worth mentioning again that there is no ergonomics degree in Brazil and, therefore, no count was obtained in this regard and this is not highlighted in the general table.

Graduation was the first item analyzed, as it is the basic training for a professor to teach at a university. As ergonomics is a multidisciplinary discipline, the classification of training considered was diverse, trying to cover different training points – exact, social, health, among others. As a main result, only 23% of the teachers surveyed have degrees in production engineering (total of 14). According to the guidelines of the Brazilian Association of Production Engineering (ABEPRO), this course has a specific area dedicated to human factors and, therefore, it is known that ergonomics subjects are mandatory for this course. Thus, it is possible to report that, of 61 teachers, only 14 had contact with ergonomics in their degrees.

Still, the concepts observed in other engineering areas are also essential for a teacher in this area. Civil Engineering, Mechanical Engineering, Control and Automation Engineering, Food Engineering, Forest Engineering and Computer Engineering appeared for different teachers as their professions. Similarly, occupational safety concepts appear in most of these, but focused on their areas. It is possible to expect that, within these areas, ergonomics is not highlighted as a discipline or as a large part of one, leaving undergraduate contact delayed.

In a similar way to other engineering areas, some degrees address issues related to ergonomics, even without having a main subject on the topic. Physiotherapy, Psychology, Design and Architecture and Urban Planning courses cover topics related to their areas, such

as worker rehabilitation, the cognitive process and mental workload, product development, accessibility and ergonomics of the built environment. These themes, for example, are diluted in most courses and, despite being important, they are not exclusive and unique in ergonomics disciplines in production engineering.

Finally, some courses with little or no relation to ergonomics appeared in teacher training, such as Visual Programming, Tourism, Nursing, Forestry Sciences, Business Administration, Computer Science, Degree in Mathematics and Textile Technology.

Most of the teachers analyzed do not have specialization (36%). All of these teachers have other types of additional training, such as a master's degree, doctorate or both. Even so, 13 teachers completed a specialization in ergonomics during their careers (22%). However, the majority of ergonomics teachers specialized in occupational safety engineering (33%). In these specializations there are ergonomics disciplines that address its main concepts, highlighting the similarity between the two areas (OSH and ergonomics).

It is worth noting that only three teachers (5%) have a specialization in higher education teaching, leaving the question as to where the current teacher learned or developed their knowledge about teaching and learning in engineering. Other specializations also appeared during the analysis, such as Construction Management, Business Management, Food Health Surveillance, IT, Productivity Engineering, Occupational Physiotherapy and Cardiopulmonary Physiotherapy.

When it comes to master's degrees in ergonomics, there is only one in Brazil, and it is at a professional level – at the Federal University of Pernambuco (UFPE), with the Postgraduate Program in Ergonomics (PPGErgo). Still, no ergonomics professor in production engineering courses took this master's degree. Another result shows that only one professor completed a master's degree in ergonomics – which was in an international environment, in Belgium. As expected, most teachers have a master's degree in production engineering (48%).

Likewise, other master's courses appeared as teacher training, with the number equivalent to those who completed a master's degree in production engineering (48%). Among these courses, it is possible to mention several Engineering areas, such as Civil, Mechanical, Agricultural, Agricultural, Urban, among others. Other courses, such as Technology, Forestry Sciences, Meteorology, Design, Geography and Biomolecular Physics. Only one professor did not hold a master's degree in any area.

Similar to undergraduate studies, there are no doctoral courses in ergonomics in Brazil. Therefore, it was not expected that there would be professors with doctorates in ergonomics teaching in production engineering. However, three teachers hold this title, granted in countries such as France and Belgium. Similarly to the master's degree, the doctorate course most found among these professors was Production Engineering, with 42%.

Another fact that stood out during data collection was the number of professors who are pursuing a doctorate in different areas (around 22%). Other areas of knowledge, such as Design, Health Sciences, Occupational Health and Safety, Forestry Sciences, Geography, Public Health and Memory and Conservation were found by the research (around 19% of the data collected). Other Engineering areas were also identified, such as Agronomy, Mechanics, Civil Construction, Electrical and Agricultural, with around 12%. It is worth noting that, in addition to the doctorates carried out in France and Belgium mentioned above, Canada and Portugal also appeared as countries in which professors completed their academic processes.

Finally, the topic of these teachers' thesis was investigated. This is justified because, even if you have a doctorate in an area that is not ergonomics, you can have a job that focuses on this. Thus, during their master's/doctorate processes, the professor may have developed ergonomics knowledge from their research and writing academic papers.

The ERG BR 1003 Standard, which establishes standards for the accreditation of Lato Sensu Postgraduate Programs [Specializations] in Ergonomics, also categorizes the evaluation of the teaching staff of the courses based on their most important academic work. For these works, we use the same concepts from three categories. For the first, which are professionals with a dissertation or thesis in the area of ergonomics, 26 professors were found (around 42%). For related areas or related fields, with theses that work in similar areas, such as occupational safety, for example, 5 professors were found. Finally, for academic work in other areas that are not related to ergonomics, 30 professors were found (49%), presenting a greater number than those who carried out theses and dissertations in ergonomics.

Discussion

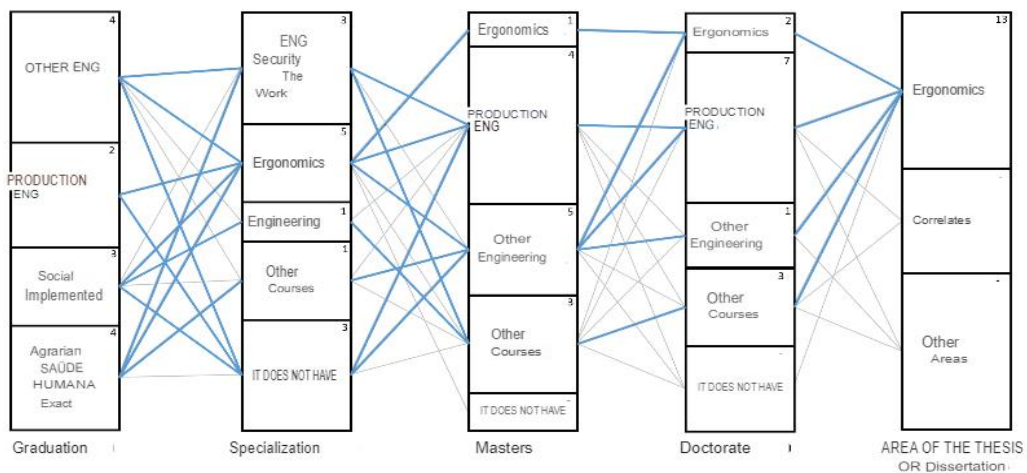
The descriptive analysis of the data showed the percentages and counts of teacher training at different levels of training. This is useful when we work on the centers and main courses carried out by these professionals, in addition to their places of work. Still, even if a professor took a certain course during his undergraduate degree, it does not mean that he

maintained it during his postgraduate studies, and he can change areas depending on his desire. Finally, as described in the results section, it may be that the professor has taken other courses, but academic work in the area of ergonomics, or in related areas.

Therefore, to discuss these results, we sought to analyze each path that this teacher took or is taking during his training. For a better analysis, it is necessary to evaluate the training of each teacher, considering a relationship between the four trainings and the theme of the thesis. Figure 3 is an example of an analysis that should be done in this way, analyzing the individual academic path of professors from universities with grade 5 in ENADE, who have theses on the topic of ergonomics.

In this image, each blue line represents an existing path that a teacher analyzed by the research has followed; gray are the others found by the research and existing in the captured panorama. The classification was done in this way, in order to facilitate the interpretation of the results and better understand these possible paths found.

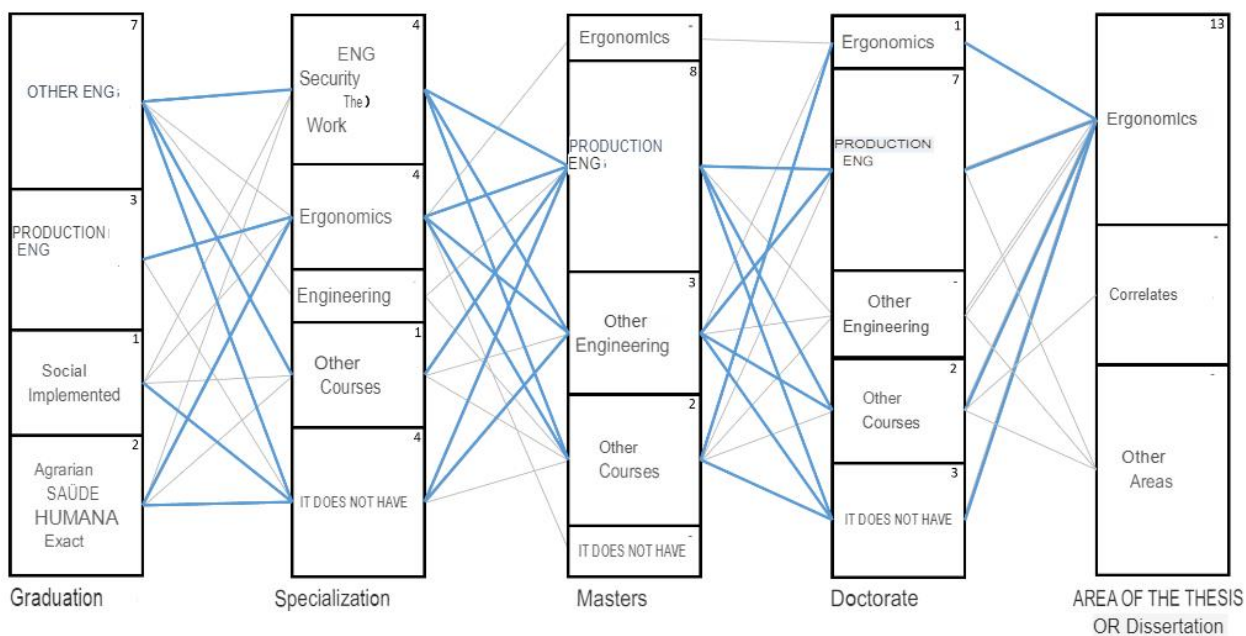
Figure 03 – Academic path taken by ergonomics teachers, in production engineering courses with grade 5 at ENADE, who have academic work in ergonomics



In Figure 3, it is possible to observe that ergonomics researchers, professors with thesis and dissertation topics in this area, come from different degrees, with different groups of degrees covered. Most of these have completed specializations in the highlighted area of research (e.g. Ergonomics or Occupational Safety Engineering), but some have not yet completed any course at this level. It is also observed that a large part of these teachers' training focuses on Production Engineering, as expected. It is also clear that everyone who researched ergonomics was based on theses. Finally, in addition to Production Engineering, other courses that also carried out research in ergonomics were identified, such as Agronomy, Agricultural Engineering and Forestry Sciences.

In Figure 4, the same characteristics as in Figure 3 are observed, but with universities with concept 4 in ENADE. However, differences were found. There are only occupational safety engineers who have done engineering other than production. Production engineers are all experts in ergonomics. The vast majority completed a master's and doctorate in Production Engineering, with final academic work in ergonomics. Three professors also stand out who have not completed their doctorate courses yet, but their master's studies present this topic. In addition to Production Engineering, other courses were also surveyed with ergonomics research in theses and dissertations, such as Social Memory and Cultural Goods, Integrated Management in Occupational Health and the Environment, Public Health and Agricultural Engineering.

Figure 04 – Academic path taken by ergonomics teachers, in production engineering courses with concept 4 at ENADE, who have academic work in ergonomics



This analysis in the form of a relationship between training was carried out for theses and dissertations on other themes (such as related ones) and on different themes. In order to avoid cluttering with repetitive figures, we chose to simply describe how the analyzes were carried out.

In view of the other analyses, other different questions were found. There is a professor who did not hold a master's degree or a doctorate, but has a specialization in ergonomics. There are also more ergonomics professors who carried out their theses and dissertations in other areas (49%) than who carried out their theses and dissertations in ergonomics (42%). This is more evident in courses with grade 4 on ENADE. Of these 35 professors who carried out theses and dissertations in other areas, only 4 carried out

specializations in ergonomics. Furthermore, a large exchange of courses was observed during his academic career, migrating to different areas and research between undergraduate, specialization, master's and doctorate degrees.

Therefore, the diversity observed in the training of ergonomics teachers exists and has its pros and cons. Due to its interdisciplinarity, it is necessary for teacher training to cover different areas, in order to have basic knowledge on different topics to address in ergonomics classes (e.g. management aspects, concepts of biomechanics and physiology, physical and mental workload, factors environmental and work-related legislation and standards). By going through different areas of knowledge, these subjects are seen and learned, so that the examples are more realistic.

However, different training courses can generate some problems from different perspectives, such as at the classroom level, at the university level and at the association level, such as ABERGO. It is clear, from this research, that there is no standard with basic requirements for the training of an ergonomics teacher. The different training leads to reflection on where the basic concepts to be taught were learned, or even if they were learned during their academic path. Furthermore, there is a hypothesis about the lack of basic knowledge that students will not acquire if teachers have not acquired it during their training. On the other hand, it is known that it is possible to acquire knowledge individually and self-taught, but practical examples and situations in the job market can become obsolete and simple in the face of the reality of the market.

For ABERGO, these deficiencies in the standardization of teacher training create problems for certification. Different training courses generate a more complex certification process. These problems could be overcome, for example, with the existence of a degree or doctorate in ergonomics or, even, the incentive to create other master's degrees in ergonomics. This would make teacher training in ergonomics standardized and governed by a certification that would be simpler to carry out.

Conclusions

The main objective of this work was to identify the training of ergonomics teachers in production engineering courses, highlighting their academic trajectory such as graduation, specialization, master's degree, doctorate and the theme of their final academic work. From the investigation of the Lattes curriculum of these professionals, who teach at universities

with courses with ENADE 4 and 5 concepts, data were collected and analyzed using a qualitative-quantitative methodology, by descriptive statistics and by analysis of the individual academic path and its implications. This research is a stage of the doctoral research of the authors of this article.

From this work, it was possible to conclude that the training of ergonomics teachers in Production Engineering courses is diverse and there is no standard. Reflection on the impacts generated are still scarce, mainly due to the lack of studies in the area and with topics that address the training of this professional. This is because most teachers did not carry out their final academic work in the area of ergonomics. Furthermore, more than half of the master's and doctoral courses were not carried out in the research areas – production engineering and ergonomics.

It is clear, therefore, that further research is being carried out in order to understand how these teachers acquired experience and knowledge in ergonomics to be taught in production engineering courses. It is possible to collect this data through interviews, questionnaires or an approach between ABERGO and these professionals. In addition to demonstrating this fact, a channel can be created to exchange needs and doubts, serving as a base for these professionals. As future work, it is also suggested to carry out the analysis for the other courses, with concepts 2 and 3 in ENADE, in order to create a complete overview of these professionals, mainly knowing their training. Finally, it is suggested to analyze the places where this knowledge is developed, encouraging and promoting ergonomics, its research and teachings.

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