

History of the Platform Work and the Didactic Resources and Educational Products Research Group

ARTICLE

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Abstract

Scientific dissemination consists of a set of activities aimed at bringing the population closer to scientific production and making knowledge accessible to all. Research groups are organized around specific themes and are concerned with the development and propagation of advances in science. In this context, the article aims to highlight scientific dissemination through the history of the emergence of the e-book "Platform with progressive collection of educational and technological products" and the Research Group on Innovation of Didactic Resources, Educational and Technological Products (GREPET). Through documentary research, the article discusses the work and the initiatives of the research group. As a result, it is important to emphasize the role of the group in the democratization of scientific and technological knowledge and in the interaction between different researchers, teachers and institutions, contributing to a sustainable development and to the fight against inequalities.

Keywords: Educational Products. Scientific Divulcation. Teaching. Learning.

História da Obra "Plataforma" e do Grupo de Investigação em Recursos e Produtos Educativos

Resumo

A divulgação científica consiste em um conjunto de atividades que tem por finalidade aproximar a população da produção científica e tornar o conhecimento acessível a todos. Os grupos de pesquisa organizam-se em torno de temáticas específicas e preocupam-se com o desenvolvimento e com a propagação dos avanços da Ciência. Neste contexto, o artigo teve por objetivo evidenciar a divulgação científica por meio da história do surgimento do e-book "Plataforma com acervo progressivo de produtos educacionais e tecnológicos" e do Grupo de Pesquisa em Inovação de Recursos Didáticos, Produtos Educacionais e Tecnológicos (GREPET). Por meio de pesquisa documental, o artigo discorre sobre a obra e sobre as iniciativas do grupo de pesquisa. Como resultado, é importante dar ênfase ao papel do grupo na democratização do conhecimento

científico e tecnológico e na interação entre diferentes pesquisadores, professores e instituições, contribuindo para um desenvolvimento sustentável e para o combate às desigualdades.

Palavras-chave: Produtos Educacionais. Divulgação Científica. Ensino. Aprendizagem.

1 Introduction

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Scientific dissemination consists of a range of activities carried out with the aim of disseminating knowledge in order to make it accessible to the public (BESSA, 2020). The structuring of this knowledge to be disseminated, in turn, goes through various organizations, including the so-called research groups, a nomenclature attributed to a group of people (researchers, professors, undergraduate and/or graduate students) who are organized around themes (or lines of research) that cover the various areas of knowledge. In this context, one of the aims of research groups, in addition to scientific development, is to disseminate science.

In this context, the article aims to highlight scientific dissemination through the history of the work entitled "Platform with a progressive collection of educational and technological products" - an interdisciplinary e-book based on the Teaching Area 46 Document¹ of the Coordination for the Improvement of Higher Education Personnel (CAPES) - and some important initiatives by the "Research Group on Innovation in Teaching Resources, Educational and Technological Products" (GREPET) - registered in the directory of research groups of the National Council for Scientific and Technological Development (CNPq) and made up of professionals and students from various fields of knowledge and institutions - since its inception. The GREPET logo and the cover of the book are shown in Figure 1.

¹ Document available at: <https://www.gov.br/capes/pt-br/centrais-de-conteudo/ensino1.pdf>.

Figure 1 - GREPET logo and cover of the e-book "Platform with a progressive collection of educational and technological products"



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Source: The authors (2023).

Originating from collaborative and collective work developed by the Reference Center for Distance Education (CREaD) in partnership with GREPET, the work highlights the exchange of experiences in a wide variety of areas (robotics, communication, architecture, computing, professional education, ethics, management, mental health, electronics, etc.) and consists of a product aimed at disseminating science through the work of members of the group.) and consists of a product aimed at scientific dissemination carried out through the work of members of the group, which includes professionals and students from different areas of knowledge, from various institutions, and which has an intercultural and interdisciplinary online collection of works and materials that enable the scientific dissemination of educational, scientific and technological products free of charge to the entire academic community.

It's worth pointing out that the work was born out of the need to develop an educational product as an element to validate the dissertation of the students on the Professional Master's Degree in Professional and Technological Education (ProfEPT) at the Federal Institute of Education, Science and Technology (IFCE). The book thus fulfills its role of disseminating the educational products of the master's students and GREPET members, as well as encouraging the development of innovative teaching materials by students at all levels of education, from undergraduate to post-doctoral interns.

As a result of its success, the work gave rise to the "Platform" series, which is also a partnership between GREPET and CREaD and aims to show interviews with the

authors of the chapters of the e-book launched. On February 23, 2022, Professor Sandro Jucá, one of the founders of the GREPET research group, was interviewed (Figure 2) and told how the e-book was produced and discussed the objectives achieved by the group's initiatives. The series is linked to the CREaD channel and is available on an online video platform for free sharing and open access.

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Figure 2 - Image of the interview with Professor Sandro Jucá about the history of the e-book created and the initiatives of the GREPET research group



Source: The authors (2023).

The "Platform" series also unfolded and led to the creation of another series called "Education and Inclusion", which consolidates the partnership between GREPET and CREaD. The new series offers the possibility of continuing the work carried out by addressing themes and personalities of great relevance to the whole community and becomes an extension action. In this way, it should be noted that the work "Plataforma", as well as contributing to the dissemination of a significant number of educational products, has provided equally important initiatives. Silva and Souza (2018) describe educational products as the result of a reflective and contextualized process that contains the knowledge of experience. An educational product is not a mere didactic exhibition, a material ready to be manipulated; it is alive, with characteristics of fluency and movement, as it represents dynamic realities. In addition, it must be appropriate to the area, have specific purposes and value social subjects, their experiences and knowledge.

Next, after the introductory section, there are sections on the development of one of the products presented in the e-book through the story of its creator - Professor Sandro Jucá, interviewee in the Platform series - the possibilities of meaningful learning as a

guide in the development of the work of the ProfEPT Professional Master's students and the emergence of the GREPET study group as the culmination of this journey. This is followed by a section outlining the methodological approach taken to produce the article and, finally, sections on the results, final considerations and references.

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2 A historical and methodological journey culminating in the development of the SanUSB educational product

The educational and technological product SanUSB, presented in the e-book, was designed and conceived by the teacher interviewed. The product in question pays homage to his grandfather who, as well as having other professions, was a cabinetmaker and carpenter and enjoyed developing products such as cabinets, tables, chairs, cupboards and pieces in general. Observing the productions devised by his grandfather, a soccer fan and supporter of Fortaleza Esporte Clube, the teacher imagined that, when he became a professional, he could also create products that would make life easier for the community in general.

When he finished high school, he joined the Mechanics course at the Federal Technical School of Ceará (ETFCE), the forerunner of IFCE, and began to have contact with the production of mechanical parts and equipment. Later, at the end of his course, he traveled to Germany, taking advantage of the German course he had completed at the German Cultural Houses of the Federal University of Ceará (UFC), and there he came into contact and began to interact with electronic interfaces. The interaction gave the teacher the perception that technological products could have a different format to mechanical ones and this made him think about developing products in software format.

On his return from Germany, he started a degree course in Mechatronics Technology at his old institution, which had changed its name from Technical School to Federal Center for Education, Science and Technology (CEFET). During this period, the teacher enrolled on the course with the aspiration of developing teaching resources, which he later discovered were what Silva and Souza (2018) call Educational Products. He then began to develop some software and, after finishing the course, he entered the master's program at the UFC in Electrical Engineering.

It is important to highlight the teacher's concern to give back to society. The development and dissemination of products, whether mechanical or electronic, was always seen by him as a way of socializing the advances generated by his research, with the main aim of improving education. According to Gonzales, López and Lujan (1996), the socialization of Science and Technology (S&T) in everyday life as a phenomenon of change in society and the understanding of its role in people's lives has its roots as far back as the 70s. In this way, there is evidence of the teacher's care and participation as a promoter of S&T wherever he goes.

While still studying for his master's degree, in the early 2000s, when there was little talk of generating electricity using sunlight and heat, the professor began to work on developing studies, assembling the first photovoltaic solar energy generation panels and it was in this context that he conceived the creation of a product for controlling and measuring the electrical and meteorological quantities of these solar energy generation panels. According to Almeida (2021), it is worth noting that until 2019, the percentage of solar energy use was very low (< 1%) compared to other sources such as: hydro (65.7%), natural gas (9.0%), biomass (8.5%), wind (8.0%) and non-renewable sources such as coal and derivatives, nuclear and oil derivatives (9.0%). In addition, it is important to emphasize the energy issue as one of today's great challenges and, at the same time, as a generator of major environmental concerns in the search for alternative sources that do not degrade the environment and enable sustainable development (ALMEIDA, 2021).

Thus, the teacher's proposal to create a device to control and measure the electrical and meteorological quantities of solar energy generation plates was aimed at a future in which such energy could be used more as a sustainable alternative. The device could later be classified as an educational and technological product. At the time, however, it was not classified as such. In 2004, now with a master's degree, the professor returned to CEFET (which was changed from a center to an institute and now uses the acronym IFCE) as a substitute professor and began researching how to design the device he had conceived during his master's degree by making electronic boards with microcontrollers and began to develop the project with his students with a view to creating a didactic proposal that takes teaching and execution into account.

The use of microcontrollers (chips with internal processors that control the board and the processes to which it is linked), however, was a barrier to the development of the project because the students had great difficulty making recordings on these chips.

Because it was an embedded system - a computer system integrated into other products and equipment with a control or monitoring function that uses hardware and software designed to perform a specific task in a larger system - there was a gap between the electronic board and the transfer of a program to make it work. In this context, the developer had to, using a certain programming language (C or assembly, for example), transport this program into the electronic board to control a certain product or embedded system and etch the chip. At the time, recorders were very expensive, which began to hinder the development process of this device.

When Microchip Technology, an American semiconductor company based in Arizona, launched PIC microcontrollers with a native USB interface, the project was given a new lease of life, as it was possible to quickly download the program from a laptop or conventional computer directly from the USB port into the chip without using an external recorder. The device, now an educational product, was called SanUSB, named after the native USB port used in the HID (Human Interface Device) protocol and the Portuguese pronunciation of the English word sun, which means sun. Since the project was to be carried out using solar energy panels, the name alludes to the sun.

In this scenario, SanUSB was the first educational and technological product developed by GREPET (which was not yet called that) and disseminated on a large scale throughout Brazil. The product, which was conceived, designed and disseminated, served as an incentive to create others and to produce a free booklet which was launched on the internet, in which the group presents a collection of its technological educational products. After five years and wide dissemination, the booklet became a book.

In 2009, the SanUSB interface was used to develop a robot in partnership with IFCE and the Liceu Professor Francisco Oscar Rodrigues High School, located in Maracanaú/CE. The robot competed and won in the "Engineering" category of the Brazilian Science and Engineering Fair (FEBRACE), a movement created to stimulate an

investigative culture, creativity, innovation and entrepreneurship in Brazilian basic education. Organized at the University of São Paulo (USP), it is considered Brazil's largest science and technology exhibition. The fair awarded the group a prize for building a "spider robot" out of recyclable material, using a TV antenna and relays.

This achievement motivated other students and teachers to use the interface. However, during the same period, the Arduino project, which emerged in Italy in 2005 and came to Brazil in 2008, became known to the group, which realized the similarity between its didactic proposal and that of SanUSB. It's worth noting that, technologically, the SanUSB of 2007 was more advanced than the Arduino of 2008. While the Arduino used a USB serial converter, i.e. a conversion chip, to communicate with the computer, the SanUSB board used a PIC with a native USB interface, which meant that the transmission part had a higher level. This technological difference meant that the SanUSB board had a slightly better level than the Arduino board.

Thus, the SanUSB didactic board, launched with the aim of teaching microcontrollers and low-cost automation projects, became a competitor to the Arduino board, which was being produced in China and was much more established on the market. While the Arduino board was ready for Brazil, the SanUSB with a PIC microcontroller was handcrafted - from construction, through the protoboard and printed circuit board, to application in automation processes - and accompanied a didactic proposal for teaching and not just execution. In order to enable students to get to grips with the elements that make up an electronic board and the stages of the automation process, a handout was made available free of charge on the internet, introducing the SanUSB tool.

The workbook, in turn, gained unexpected notoriety. At a meeting to evaluate Pronatec courses at IFCE, an evaluator from the Federal Institute of Northern Minas Gerais (IFNMG) thanked the authors for publishing the workbook free of charge and said that he had used it at IFNMG to develop microcontroller projects using the SanUSB board. Moved by the possibilities generated by his project and by the scope of a thought gestated in childhood by the influence of his grandfather, the teacher was motivated to research this and other topics with the intention of developing and disseminating even

more educational products. According to Simões Neto and Rocha (2019), intentionality is the best way to provide higher quality training. With this in mind, the teacher accepted the proposal to join the teaching staff of the Professional Master's Degree in Professional and Technological Education (ProfEPT).

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3 The Master's Degree in Professional and Technological Education and the possibilities for meaningful learning

The Professional Master's Degree in Professional and Technological Education in a National Network provides training for professionals in the Federal Network of Professional, Scientific and Technological Education (Rede EPT). The programme aims both to produce knowledge and to develop products by carrying out research that integrates the knowledge inherent in the world of work and systematized knowledge. To complete the course, master's students must submit their dissertation and develop an educational product in any area of knowledge.

The interdisciplinary possibilities provided by his entry into teaching at ProfEPT meant that he was able to devise, together with his students, methodologies and products that could help other people and contribute as important teaching tools. In this context, products have been developed in the areas of history, health, literature and architecture, among others. All the projects and materials developed by the teacher and his group of students (books, information, educational products) can be found on the "sanusb.org" website and on the "sanusb.blogspot.com" blog. It should be noted that this interdisciplinary vision of the use of new technologies is very current, which shows the visionary aspect of the teacher.

The leap in quality using new technologies enables innovations in the way the curriculum is worked on, through the actions of the teacher, as well as encouraging the use of new teaching technologies, stimulating interdisciplinary research adapted to the Brazilian reality (MERCADO, 1998). According to Philippi Junior and Fernandes (2021), technology is an interdisciplinary phenomenon, not only because of its constitution, but above all because of its effects. Just think of its influence on everyday life. There are local

and global applications that demand diverse knowledge and interactions, producing new forms of action and knowledge.

The experiences and guidance acquired by the teacher in Post-Graduate Courses in Teaching for Professional and Technological Education (EPT), lead him to infer that for meaningful learning it is advisable to contextualize and present, when possible, meaning to the content covered in order to arouse students' interest in the specific subject. Jan Amos Comenius, considered the father of modern didactics, believed in the need for a method to stimulate interest in content other than discipline imposed by punishment, and that it was up to the teacher, mediator or facilitator, when using the didactic method, to try to prepare and stimulate students for the teaching-learning process (ALMEIDA et al., 2019). In the same vein, Henri Wallon, a learning theorist who dedicated himself to understanding the human psyche, its mechanisms and relationships, also argued that stimulating affectivity and interest in the content covered facilitated the teaching-learning process. When the content (or message) that the teacher (or sender) transmits meets an interested student (or receiver), this content will be understood and assimilated much more effectively (ASSIS, 2020).

Thus, the teacher exemplifies Project-Based Learning (PBL) as a teaching method that aspires to meaningful learning and provides opportunities to develop knowledge by designing projects or solving problems that require useful skills in real life. In order to stimulate some knowledge of the world of work in subjects in the areas of Electronics and Microcontroller Programming for courses in the areas of Computing and Engineering, the construction and programming of educational projects and products are developed, preferably real and contextualized. Simulated projects are also valid for the assimilation of content and the development of the subject, in which the choice of project to be developed will be made by the student themselves, adapting to the needs, possibilities, interests and curiosities related to the area of training.

The use of projects provides a different form of assessment, a "dynamic, shared, multiple and procedural act" that is much richer than traditional forms of assessment (ESTEBAN, 2012, p. 88). In this case, the assessment of the projects is carried out through the presentation of the theoretical work, in the form of a scientific article

describing the project or educational product with a literature review, implementing and improving the principles of scientific methodology, and also through the presentation of the practical project, which is a real or simulated project, prototype or product developed during the semester.

In order for the projects to be feasible, i.e. executable within a given timeframe and also following the guidelines of the PBL methodology, a timetable is established for the development and presentation of the project idea, also called a pre-project. Project Pedagogy was introduced in Brazil with the arrival of the New School, disseminated by Anísio Teixeira, one of the precursors of the New School, introducing the ideas of projects as pedagogical practices, in which the central idea was to learn by doing (ARRUDA; NASCIMENTO, 2019).

In addition, it is worth remembering that when a certain concept of a teaching-learning object is contextualized through practical activity, it is commonly found that the content is assimilated more naturally and educational projects and products are developed at a higher level than expected. Contextualization thus generates participation, interaction and stimulates interest and autonomy. For Wallon (2008), the relationship between student and teacher is important for learning and teaching. In this sense, affectivity on the subject is also stimulated and the result obtained is much greater than expected.

4 The strengthening of scientific dissemination and the creation of the Research Group on Innovation in Teaching Resources (Grepet)

The emergence of the aforementioned website and blog strengthened the scientific dissemination of projects being carried out in the Professional Master's Degree in Professional and Technological Education (ProfEPT). In addition to dissemination, the professors also planned to organize and broadcast lectures, invite researchers to jointly produce materials and produce educational products that could be useful to someone, as was the case with the SanUSB toolkit used by the IFNMG professor. The expansion of ideas provided by the reach of the website and blog led to the creation of a formal

research group with the CNPq called the Research Group on Innovation in Teaching Resources (GREPET).

The group is currently disseminating the educational and technological products designed by its members and producing a series of themed books. The book "Platform with a progressive collection of educational and technological products"² is the first to bring together this idea of producing educational objects. The proposal is also to publicize products that are not included in this work and that have been developed in our country. The ProfEPT master's program, for example, is being developed in around 40 institutions. The program in question is not the only one in which educational products are developed. Other programs, universities, researchers, teachers and independent students also carry out research in this direction. GREPET's intention is to strengthen the dissemination of free products, including those developed with free software.

The research group has a motto used by its members that says "GREPET, where those who publish repeat" and goes on to create series of themed books. One of its most recent productions includes a book of academic and personal experiences of Brazilians in Europe and Europeans in Brazil. The work, made available free of charge by the group on its website, presents curious stories and is a book that is both instructive and a source of entertainment and will undoubtedly be a pleasant read for those who want to travel to Europe or for those who have already been and want to know a little more about other stories.

All of GREPET's achievements are very relevant to the democratization of scientific dissemination. With members who are now spread throughout Brazil, the group believes in a proposal that includes more than just scientific dissemination through the presentation of projects at events. The group's philosophy supports the use of other colleagues' educational products as an aid to strengthening and improving teaching processes and classroom work. When we bring motivation to the content given in our subject, we do what Wallon proposes (a learning theorist who dedicated himself to understanding the human psyche, its mechanisms and relationships), we bring affectivity

² The book is available for download at: <https://podeditora.com.br/wp-content/uploads/2021/12/Livro-Plataforma-Produtos-Educacionais-A5.pdf>.

to the teaching-learning process. Taille, Dantas and Oliveira (1992), state that affectivity, according to Wallon, is a phase of human development, the most archaic, which after leaving purely organic life, becomes an affective being. Thus, rationality slowly differentiated itself from affective life. Therefore, affectivity and intelligence are united in the early days of human formation, with the former predominating.

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This means that the content (or message) that the teacher (or sender) must transmit in his or her lesson must find a student (or receiver) who is interested in it so that it can be understood more effectively. Thus, when real educational products are built and the study is contextualized in the classroom, the applications make sense of what is being done, the class shows interest, excitement and this makes the process, set in the classroom, more enjoyable and culminates in more effective learning. The experiences of GREPET members back up this thought. According to Araújo (2021), the best way for students to learn science, for example, is for them to do it themselves, as this gives them the opportunity to discover and reframe knowledge, based on scientific research methodology. When the contextualization of a given concept is transferred to a teaching-learning object that often involves a practical activity, students assimilate the ideas more quickly and develop projects and products beyond expectations. Contextualization thus generates participation, social interaction and awakens students' interest.

GREPET today, aware that its work has benefits beyond academia, interacts with people who make a difference in carrying out social work, such as Father Rino, who is involved in the mental health movement in the Bom Jardim neighborhood. Whether it's publishing a scientific article, making electronic boards or robots, or producing books or collective and collaborative works, GREPET's work brings a lot of satisfaction and even greater inspiration for teachers and researchers to continue believing in educational and technological products that can benefit both the academic community and the community as a whole.

The following section presents the methodological path taken to produce this article.

5 Methodological path

A study based on the conception and production of the work "Platform with a progressive collection of educational and technological products" and the initiatives carried out by GREPET with a view to the scientific dissemination of the work developed by the group's members (the aforementioned work and other projects) was motivated by the dissemination by members of the group itself, at the beginning of 2023, of interviews carried out in 2022 for the "Platform" series. The aim was to introduce the group's productions to new members. One of the interviews featured GREPET's leader, Professor Sandro Jucá, and aired on February 23, 2022 on the CREaD | IFCE channel.³ The story that makes up the interview led to a team being set up to recover the group's memories.

Thus, from March to July 2023, a search was carried out in the group's collection with the aim of undertaking a historical rescue of its creation and a record of the initiatives that culminated in educational products already disseminated to the academic community. The team responsible for collecting the data that led to this writing was made up of the authors of this article, which has a qualitative approach. The contents studied for this research were understood through documentary analysis which used primary sources obtained from various records available in GREPET's collection and which were the result of the group's research and work.

Documentary analysis involves recognizing, confirming and evaluating documents for a particular purpose and is characterized by being a research "[...] of materials that have not yet received an analytical treatment, or that can still be reworked according to the objects of the research" (GIL, 2008, p. 45). As such, research "[...] aims to produce new knowledge, create new ways of understanding phenomena and make known how they have been developed" (SÁ-SILVA; ALMEIDA; GUINDANI, 2009, p. 14). Therefore, from the treatment given to the documents, i.e. all the records used, there is the construction of knowledge awakened by the combination of educational products, GREPET and scientific dissemination.

³ The full interview is available at: <https://youtu.be/5BWzwF9dW1c?si=kaKYXtnmNRFCGrRh>.

Data was collected indirectly. According to Gil (2008, p. 147), "there are data that, although referring to people, are obtained indirectly, which take the form of documents, such as books, newspapers, official papers, statistical records, photos, disks, films and videos, which are obtained indirectly". For the collection, the team based itself on the records made by the group's members on their blog [GREPET blog address: [http://sanusb.org/.](http://sanusb.org/)] (books and articles published, educational products developed, articles, interviews, lives, lectures, etc.) and the group's registration in the CNPq directory of groups.

In this way, the team can organize a history that takes into account the trajectory of the group's leader and the contributions of the members in carrying out projects aimed at promoting scientific dissemination and the democratization of scientific and technological knowledge, seeking not only to disseminate free educational products, but also to encourage the use of free software and interaction between different researchers, teachers and institutions.

6 Results

This article highlights the history and relevance of GREPET, as well as the importance of the e-book "Platform with a progressive collection of educational and technological products" and its contributions to scientific dissemination and the democratization of knowledge. It also highlights the main methodological principles used by the group, such as contextualization, interdisciplinarity, Project-Based Learning (PBL) and the relationship between affectivity and learning.

Thus, the study looks at the origin of the "Platform" project (the e-book, the series and the developments that were part of the process) as a result of collaborative work between CREaD and GREPET. The intercultural and interdisciplinary online collection made available by the group allows the free dissemination of educational, scientific and technological products to the entire academic community, highlighting its concern to share knowledge and socialize advances generated by its research.

Another important point is the development of the SanUSB educational and technological product, conceived by the professor interviewed, which pays homage to the memory of his carpenter grandfather. SanUSB, initially created as a device to control and measure electrical and meteorological quantities of solar energy generation panels, ended up becoming a teaching tool that provided meaningful learning for the group's students and encouraged the use of new technologies in teaching.

The methodology adopted by GREPET is described as an interdisciplinary approach that values the contextualization of content, stimulating student interest and promoting more effective learning. Project-Based Learning (PBL) is cited as a methodology used to develop projects and educational products that are relevant and applicable in the real world, allowing for dynamic and shared assessment. It is important to emphasize the role of the group, which values interaction with the community and promotes outreach activities to share its knowledge with society, contributing to sustainable development and combating inequalities.

Final considerations

GREPET's creation is linked to the development of research, teaching and extension projects that articulate conceptual and theoretical discussion with the approach to themes or problems arising from professional activity and/or the reality experienced by researchers and/or the community. Therefore, it should be noted that GREPET's work aims to contribute to the socialization and democratization of scientific and technological knowledge in different educational and institutional contexts, since the development of educational and technological products seeks to implement solutions that provide critical, ethical, supportive and democratic training in the production of knowledge and, consequently, to combat the various forms of inequality.

The story of GREPET's emergence can be summed up in three words: inspiration, motivation and expansion. According to the teacher interviewed, the inspiration came from his grandfather, who as a child witnessed his passion for creating utensils and preserving them. The second moment, when SanUSB was already in place, motivation arose unexpectedly when the teacher received a thank you from another

teacher, from an institution in Minas Gerais, for helping them in their electronics classes with all the material made available and the practical applications in the classroom that SanUSB allows. The expansion and, consequently, the creation of the GREPET research group came about with its entry into the master's program in professional education, in which the teacher was able to see an opportunity to expand the limits of action in electronics learning to other areas of knowledge, thus sharpening curiosity and aiming to stimulate interest in research on the part of students in postgraduate programs.

The work carried out by GREPET stands out as an example of how interdisciplinarity, contextualization and project-based learning can make education more meaningful and impactful in the formation of individuals and society as a whole. In addition, the story of the e-book and GREPET's initiatives highlight the relevance of scientific dissemination, as well as the group's contribution to the training of critical, ethical and supportive professionals.

Acknowledgement

The authors would like to thank the National Council for Scientific and Technological Development (CNPq) for the doctoral research grant awarded to the first author of this work.

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Responsible publisher: Genifer Sousa

Ad hoc expert: Cecilia Rosa Lacerda and Emerson Augusto de Medeiros.

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How to cite this article (ABNT):

SOUZA, Lana Priscila; CAPISTRANO, José Gleison Gomes; JUCÁ, Sandro César Silveira; SILVA, Solonildo Almeida da; SOUZA, Gabriela Pereira. História da Obra Plataforma e do Grupo de Pesquisa de Recursos Didáticos e Produtos Educacionais. **Rev. Pemo**, Fortaleza, v. 6, e11111, 2024. Available at: <https://revistas.uece.br/index.php/revpemo/article/view/11111/version/10108>

Received on July 25, 2023.

Accepted on October 09, 2023.

Published on February 24, 2024.