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Contributions of "Show das Ciências" extension project to the construction of the training profile of exact sciences graduates at UFPR – Setor Palotina

Contribuições do projeto de extensão "Show das Ciências" na construção do perfil de formação de licenciados em Ciências Exatas da UFPR - Setor Palotina

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ABSTRACT

This paper explores the importance of extension projects. To this end, it addresses the curricularization of extension in undergraduate courses and highlights the positive impact of the specific project "Show das Ciências" in the degree course in Exact Sciences (LCE) at the Universidade Federal do Paraná (UFPR), Palotina Campus. The type of research used was qualitative field research, with interviews as the data collection instrument. The "Show das Ciências" seeks to integrate academic knowledge with the community, facilitating the dissemination of scientific knowledge. This study focuses on the contributions of this project to the academic, professional and personal development of LCE students. By actively participating in the "Show das Ciências", students improve their communication skills, apply knowledge in practical contexts and strengthen the link between academia and society. This extracurricular experience not only complements the academic curriculum, but also develops interpersonal skills and promotes a sense of social responsibility. In short, the "Show das Ciências" extension project is a relevant component in the training of LCE students, enabling them not only to become qualified professionals, but also committed citizens who are aware of their role in society, which is in line with the desired graduate profile in the LCE Course Pedagogical Plan.

Keywords: Extension projects. Degree. Exact Sciences. Education. Graduate profile.

RESUMO

Este trabalho explora a importância dos projetos de extensão. Para tanto, aborda a curricularização da extensão nas grades curriculares dos cursos de graduação e destaca o impacto positivo do projeto específico "Show das Ciências" no curso de Licenciatura em Ciências Exatas (LCE) da Universidade Federal do Paraná (UFPR), Setor Palotina. O tipo de pesquisa utilizada foi a qualitativa de campo, sendo as entrevistas o instrumento de coleta de dados. O "Show das Ciências" busca integrar conhecimentos acadêmicos à comunidade, facilitando a divulgação do saber científico. Este trabalho foca as contribuições desse projeto para a formação acadêmica, profissional e pessoal dos estudantes de LCE. Ao participarem ativamente do "Show das Ciências", os acadêmicos aprimoram suas habilidades de comunicação, aplicam conhecimentos em contextos práticos e fortalecem a ligação

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entre academia e sociedade. Essa experiência extracurricular não só complementa o currículo acadêmico, mas também desenvolve competências interpessoais e promove um senso de responsabilidade social. Em suma, o projeto de extensão "Show das Ciências" apresenta-se como um componente relevante na formação dos estudantes de LCE, capacitando-os não apenas como profissionais qualificados, mas como cidadãos comprometidos e conscientes de seu papel na sociedade, o que está de acordo com o perfil de egresso desejado no Plano Pedagógico do Curso de LCE.

Palavras-chave: Projetos de Extensão; Licenciatura; Ciências Exatas; Formação; Perfil do Egresso

ABSTRACT

This paper explores the importance of extension projects. To this end, it addresses the curricularization of extension in undergraduate courses and highlights the positive impact of the specific project "Show das Ciências" in the degree course in Exact Sciences (LCE) at the Universidade Federal do Paraná (UFPR), Palotina Campus. The type of research used was qualitative field research, with interviews as the data collection instrument. The "Show das Ciências" seeks to integrate academic knowledge with the community, facilitating the dissemination of scientific knowledge. This study focuses on the contributions of this project to the academic, professional and personal development of LCE students. By actively participating in the "Show das Ciências", students improve their communication skills, apply knowledge in practical contexts and strengthen the link between academia and society. This extracurricular experience not only complements the academic curriculum, but also develops interpersonal skills and promotes a sense of social responsibility. In short, the "Show das Ciências" extension project is a relevant component in the training of LCE students, enabling them not only to become qualified professionals, but also committed citizens who are aware of their role in society, which is in line with the desired graduate profile in the LCE Course Pedagogical Plan.

Keywords: Extension projects. Degree. Exact Sciences. Education. Graduate profile.

INTRODUCTION

The effective integration of university outreach (known in Brazil as “extensão universitária”) into the teacher training process has stood out as an important element in higher education. Academic outreach projects, which encompass a wide range of activities and interactions with the community, offer opportunities for students and teachers to engage in practical experiences that transcend the boundaries of the classroom. The curricularization of outreach, which incorporates these outreach activities into the academic curriculum, has played a fundamental role in strengthening the connection between the academic community and society. (Garcia, 2012).

The National University Extension Plan (PNExt, 2001) and the National University Extension Policy (2012) regulate guidelines on the nature of university outreach, its approach, and essential principles, including its integration as an integral part of academic training. The National Guidelines, linked to the 2014-2024 National Education Plan (PNE), consolidate this academic dimension. Thus, the debate arises about curricular flexibility, which aims to identify a way to develop an ideal curriculum that contemplates what is proposed by the PNE and that is aligned with the university's

mission and the desired profile for the graduate. In this way, some courses needed to reformulate their respective curricula and make pertinent modifications to their pedagogical projects, as proposed by Silva (2019). Regarding the Undergraduate Course in Exact Sciences (LCE) at the Federal University of Paraná (UFPR), Palotina Campus: "(...) the regulation that guides all procedures related to extension accreditation is document nº 2770478, attached to SEI process nº 23075.029440/2020-22 which documents the elaboration of this Pedagogical Project" (UFPR, 2020, p. 28).

The importance of investigating the integration of university outreach into the academic curriculum lies in the need to understand, academically, how and in what way extension can enrich teacher training, benefiting both students and faculty (Garcia, 2012). To address this issue, qualitative field research becomes an essential tool. It allows for the exploration of the dynamics, challenges, and achievements of extension projects in a contextualized manner, capturing the complexity of interactions between the academy and the community (Duarte, 2004).

In order to analyze the relationship between outreach activities and teacher training, the use of semi-structured interviews emerges as an effective approach to collect this data qualitatively. Interviews offer the opportunity to hear the perspectives and experiences of those involved in the “Show das Ciências” [“Science Show”] outreach projects, whether they are students, teachers, or community members. Through interviews, it is possible to explore in depth the benefits, challenges, and impacts of these experiences, both from an academic and personal point of view (Guazi, 2021).

This study aimed to investigate the contributions of the "Show das Ciências" outreach project to the professional profile of students who graduated from the Exact Sciences Teacher Training course at the Federal University of Paraná, Palotina Campus, and participated in the "Show das Ciências" outreach project. In doing so, it is intended to contribute to a greater understanding of this process and its impact on the training of these future teachers.

METHODOLOGY

Initially, it was necessary to define the type of research to be used. For this, several meetings and readings were necessary. Adhering to what was proposed by Marconi and Lakatos (2003, p. 155), the following six steps were followed for the development of the work:

1. Selection of the topic or problem for investigation.
2. Definition and differentiation of the problem.
3. Formulation of working hypotheses.

4. Collection, systematization, and classification of data.
5. Analysis and interpretation of data.
6. Reporting of research results.

During the meetings, several issues arose regarding the research object, and at each meeting, further readings were necessary to align the desired research type with what was proposed in the literature. After some discussions, it was decided that the research to be developed in this work would be qualitative and exploratory, of an interpretivist and field-based nature. It was also defined that the data collection instrument to be used would be interviews, which were recorded for subsequent transcription. As for the nature of data analysis, this was defined after the interviews, considering the continuous need for theoretical grounding aligned with the complexity of the research object.

The qualitative research approach was chosen because this type of investigation exhibits unique characteristics that align with the problem statement proposed for the current investigation. Some of these characteristics include: the consideration that the natural environment represents a direct source of data, where the researcher plays the role of mediator in observing and collecting this data; the descriptive nature of the research, as it is imperative to describe the environment and the relationships present within it; the emphasis on process, valuing not only the results and products; the inductive approach in data analysis; and, above all, the prioritization of meaning as a central concern in this type of investigation (Macedo, 2022).

Among the branches of qualitative research, the one chosen for the development of the present work was field research, which, according to Fontelles et al. (2009, p. 7):

> Field research aims to collect data that allows it to answer problems related to groups, communities, or institutions, with the objective of understanding the most diverse aspects of a given reality. It is most frequently used in the human and social sciences, employing observational techniques and questionnaires for data collection.

The results were obtained from interviews conducted with predefined participants, who are graduates of the LCE course and former members of the "Show das Ciências" outreach project at UFPR Palotina Campus.

The project in question, whose first edition took place from March 2018 to December 2019, resulted in a play titled: “Não é magia, não é bruxaria: é Ciência” [“It is not magic, it is not witchcraft: it is Science"], which has an interdisciplinary nature (Physics, Chemistry, Literature, Arts, and History). Its main purpose is to foster dialogue between society and the university, aiming to attract high school and elementary school students to the university environment, with a particular emphasis on encouraging interest in the Bachelor's degree in Exact Sciences. (Costiche et al., 2019; Costiche and collaborators, 2019 and Silva et al., (2022) discuss this project in greater detail).

The subjects of this research are former members of the project, undergraduate students of the LCE course at UFPR Palotina Campus, from various periods of the course. However, when the interviews took place, seven of the nine participants had already graduated from the LCE course at UFPR Palotina Campus, with one student in the final period of the undergraduate program and the other a dropout from the course.

For Marconi and Lakatos (1995, p. 164), the “elaboration or organization of research instruments is not easy, it takes time, but it is an important stage in research planning.” The chosen data collection instrument was the interview, because according to Macedo (2022, p. 298), “the researcher has the possibility of observing and recording both verbal and non-verbal communications (attitudes, behaviors, facial expressions, etc.).” Besides being an instrument that allows greater flexibility, creativity, and fluidity, it is capable of offering a considerably more substantial contribution in view of the general and specific objectives to be achieved (Miguel, 2010).

For the interview to take place, it was first necessary to define the type to be used. To this end, theorists who addressed the topic were sought to define the interview modality to be followed. After reading, the semi-structured, individual, and recorded interview was chosen. In this scenario, the interviewer uses a script but maintains the flexibility to deviate from it, allowing the interviewee to approach the question more subjectively (Santos, Jesus, Battisti, 2021). Regarding them being individual, this choice was made to accommodate the availability of the research subjects. Not to mention that individual interviews also allow the interviewee to feel more comfortable reporting their experiences.

For the interview's preparation, a script was created to meet the objectives of this research, aiming to foster an environment where the interviewee felt comfortable to share and narrate aspects of their participation in the project. After the questions were

developed, an Informed Consent Form (in Portuguese: Termo de Consentimento Livre Esclarecido [TCLE]) was produced, and along with this document, the interview questions were sent so that the subjects could familiarize themselves with the content to be addressed.

The invitation was extended virtually, with a group created on the WhatsApp social network. Initially, eleven students were invited; however, only nine accepted. Along with the invitation, the TCLE had also been sent for the students to sign, either physically or remotely, allowing for the subsequent scheduling of interviews. These took place over approximately 15 days. Once scheduled, they were conducted via the Microsoft Teams platform, which allowed for meeting recording, this being the decisive factor for choosing that platform.

After all interviews were conducted, the obtained data was analyzed and categorized. Following categorization, Bardin's (1977) proposed method was followed, and an analysis was performed based on the number of occurrences for each category. Subsequently, the results were duly processed, with a problematization for each question, seeking theorists who corroborated the obtained data.

RESULTS AND DISCUSSION

After the interviews, data analysis was based on Laurence Bardin's 1977 work "Content Analysis." Following the third part of the book, which addresses analysis methods, the initial steps involve: selecting the document for analysis, formulating hypotheses and objectives, and "developing indicators to support the final interpretation" (Bardin, 1977, p. 95).

According to Bardin (1997, p. 103), transforming the material implies encoding it. This encoding involves a systematic conversion of raw text data, following specific rules. This transformation, which includes cutting, grouping, and enumerating, aims to create a representation of the content or its expression in order to clarify for the analyst the characteristics of the text, which can serve as indicators.

In order to facilitate the analysis of occurrences, some questions were divided into two parts: A and B. Chart 1 shows the results of the first interview question.

Chart 1 - Occurrences of responses to question 1: "During your undergraduate studies, were you aware of other outreach projects of the LCE course - Palotina Campus? How did you learn about them?"

Part A:	
CATEGORY	**NUMBER OF OCCURRENCES**
Yes	8
No	1
Part B:	
CATEGORY	**NUMBER OF OCCURRENCES**
Through teachers	5
Through other projects	3
Through social media	2

Source: Own work (2023).

As shown in chart 1, it was possible to separate the responses from Part B into three categories. There is a noticeable difference in the number of occurrences in parts A and B. This happened because some students indicated having knowledge of the projects through more than one means. Another piece of information that can be obtained from the table is that the majority of interviewees are familiar with other outreach projects from the Undergraduate Degree in Exact Sciences (LCE) course at the Federal University of Paraná (UFPR), Palotina Campus, and that the most effective and common means of dissemination is through the project teacher-coordinators themselves. Followed by dissemination through other projects, a justification for which is the presence of coordinating professors in the projects that the students were part of. This ultimately associates the first with the second response.

This data aligns with what is proposed by the Course Curriculum Design (in Portuguese: Projeto Pedagógico do Curso [PPC]) of LCE-UFPR, Palotina Campus (2020), as:

> UFPR offers a variety of programs, projects, and agreements that will extend to students in the Palotina Campus, offering scholarships and encouraging participation in outreach and research projects (UFPR, 2020 pg. 9).

In other words, the Course Curriculum Design of LCE provides information about the existence of various other projects offered by the university and its faculty, presenting an opportunity for access to them, and thus promoting a diversified education

for the students. However, chart 2 shows that despite having access to information about other existing extension projects, not all interviewees actually participated in other outreach projects, specifically.

Chart 2 - Occurrences of responses to question 2: "During your undergraduate studies, were you involved in any other outreach projects? Which ones?"

Part A:	
CATEGORY	**NUMBER OF OCCURRENCES**
No	6
Yes	3
Part B:	
CATEGORY	**NUMBER OF OCCURRENCES**
Meninas na Ciência [Girls in Science]	1
FECITEC	1
PREVEC	1
Laboratório de Física [Physics Laboratory]	1

Source: Own work (2023).

As in question 1, in question 2, there was also a divergence in the number of responses from part A to B. This occurred because one of the students participated in 2 of the mentioned projects. According to the data in chart 2, a difference can be observed between the responses to the first and second questions, respectively, given that despite the majority of students being aware of other extension projects, less than half participated in them. An important point: although the "no" response was the majority, this does not mean that these students did not participate in other types of projects, but rather that there was no participation in other outreach projects.

In the interviews, an evident difficulty was noted among the subjects in identifying outreach projects from other types of projects. When asked, many of them mentioned different categories, such as the Institutional Program of Scholarships for Teaching Initiation (PIBID), the Pedagogical Residency Program (PRP), and projects related to Licentiate degrees and Scientific Initiation (IC), which highlighted the variety of projects and programs students had access to.

Most respondents completed their undergraduate degrees shortly after the curriculum was reformed to include Atividades Curriculares de Extensão [Curricular Outreach Activities] (ACE). This means these activities were introduced during their time as students, as outreach was not previously considered "required" in the curriculum until the aforementioned reform. Following this alteration, the ACEs became mandatory for the LCE course and were included in the course's curriculum, with a workload of approximately 11% (375h - three hundred and seventy-five hours) in any of the specializations (UFPR, 2020).

Two possible justifications for the inclusion of ACEs, also referred to as the curricularization of extension, are: 1- the need to align with goal 12.7 of the National Education Plan (Brasil, 2014): "12.7) to ensure, at minimum, 10% (ten percent) of the total curricular credits required for undergraduate degrees in university outreach programs and projects, guiding their actions, primarily, towards areas of great social relevance"; 2- the need to promote a transformative interaction between higher education institutions and society in general (PPC, 2020).

According to Costa and Debald (2022), the mere implementation of CNE/MEC Resolution 07/2018, which mandated the inclusion of outreach activities as part of the undergraduate curriculum, does not automatically guarantee its effective incorporation into the academic environment. Often, teaching practices prioritize instruction over the practical application of knowledge in a professional context.

Thus, the curricularization of outreach required a review of the curricular structures and pedagogical approaches of undergraduate programs, as well as demanding faculty training to effectively integrate it into the classroom (Costa, Debald, 2022).

It can be said that this creates opportunities for all students to participate in outreach activities that can enrich their human development. This approach allows for both formation and self-formation, as by engaging in community actions, students develop through differentiating their own identities in relation to others, recognizing them as genuine and unique entities, not merely as a reflection of themselves. Outreach promotes sensitive and engaged listening, rather than a mere intervention in the community and upon the other. By establishing egalitarian dialogues, it encourages the

appreciation of alterity and the capacity for adaptation, resulting in a more authentic relationship with others' perspectives and actions (Ribeiro; Mendes; Silva, 2018).

Regarding curricular integration in the LCE course, the ACEs are distributed across the following disciplines and specializations of the mentioned course, as per Table 1:

Table 1 - Courses with outreach activity hours.

Courses with outreach activity hours		**OUTREACH**		
	TW	**P**	**M**	**C**
Integration Projects in Exact Sciences	60	30	30	30
Integration Project in Education and Teaching of Exact Sciences	30	15	15	15
Specific Supervised School Internship	75	75	75	75
Supervised Teaching Internship in Physics I	120	120		
Supervised Teaching Internship in Mathematics I	120		120	
Supervised Teaching Internship in Chemistry I	120			120
Supervised Teaching Internship in Physics II	135	135		
Supervised Teaching Internship in Mathematics II	135		135	
Supervised Teaching Internship in Chemistry II	135			135
Total workload in outreach activities per qualification		**375**	**375**	**375**

Notes: TW: Total Workload; **P:** Physics; **M:** Mathematics; **C:** Chemistry

Source: Adapted from PPC Exact Sciences (2020).

It is important to highlight that there is a time difference between when the outreach project was in effect and when the interviews were conducted. In the former, curricularization was in the process of implementation. In the latter, the integration of outreach into the curriculum had already been completed. Thus, it can be said that the "Show das Ciências" contributes, indirectly, to the curricularization of outreach.

The courses Integration in Exact Sciences and Integration in Education and Teaching in Exact Sciences share the characteristic of providing students with their first contact with outreach activities conducted by the course's professors, while the other subjects involve them in carrying out outreach actions (UFPR, 2020). This aligns with the purpose of integrating outreach into undergraduate curricula: to contribute to the fluidity of the teaching-research-outreach triad, particularly regarding the outreach dimension, thereby ensuring greater harmony and effectiveness of this set of activities in higher education courses (Soares; Silva, 2022).

Arantes et al. (2023) inform us that the UFPR Palotina Campus had 31 outreach projects until 2020, a considerable decrease compared to 2017, when the sector had approximately 56 projects. Veterinary Medicine (35%), Exact Sciences (17%), and Agronomy (16%) ranked first, second, and third, respectively, in their involvement in these outreach programs/projects.

Regarding the LCE course, the number of existing and offered projects is considerable, and, according to Arantes et al. (2023, p.91), "it is understood that, in the teacher training process, the outreach experience in the school environment is fundamental, even before the internship period." To this end, the course offers various projects, such as PIBID, PRP, and Licenciar, which allow students to gain exposure to schools before their internships. Such projects are not considered outreach projects; however, they have an outreach character.

Regarding outreach projects, the "Show das Ciências" discussed in this work is relatively well-known in the Palotina Campus. It is important to note that all interviewees, whose responses resulted in the data for this investigation, are former participants of this project. Chart 3 presents the subjects' appreciation of their participation.

Chart 3 - Occurrences of responses to question 3: “How would you describe your participation in “Show das Ciências” outreach project?”

CATEGORY	NUMBER OF OCCURRENCES
Challenging	2
Active	2
Cool	1
Complex	1
It was a gift	1
Important	1
Extensive	1
Unique opportunity	1

Source: Own work (2023).

Table 3 shows that participation in the project, from the perspective of those involved, was overwhelmingly considered positive, given the number of positive attributes that appeared in the responses, such as: "cool," and "important." Despite "challenging" appearing twice, neither instance refers to the project's inherent difficulty, as Subject 4 reported: "In the beginning it was very challenging because I felt very

reserved, but then I think I had a very active participation", and Subject 5, who reported initial difficulty due to shyness, such as in preparing solutions and insecurity. Therefore, it can be said that, despite the term having a "negative" semantic load, it did not appear with the same meaning in the responses. One of the students, however, describes their participation as "complex." This complexity refers to answering the aforementioned question. The same individual reports that the project "brought significant contributions to my academic and teaching career." (Subject 9).

Regarding this question, the answers were quite diverse. For example, Subject 6 leaves the interviewer with an interesting phrase: "it was a gift I received to join the project..." (Subject 6); while Subject 7 reports "it was a unique opportunity, and the relationship it creates among project members is something very beautiful" (Subject 7), which leads us to consider that the project itself was of great value to its current ex-participants.

Directly linked to this question, question number 4 of the interview was asked to verify the aspects related to the participation of these students in the project.

Chart 4 - Occurrences of responses to question 4: “In your opinion, how did “Show das Ciências” project contribute to your academic and professional development?”

CATEGORY	NUMBER OF OCCURRENCES
Overcoming the fear of the classroom	4
Personal development	2
Loss of shyness	2
Improved communication	2
Improvement in interpersonal development	2
Development and planning	1
Curriculum development	1
Respect for others	1
Body language	1
Ways of approaching knowledge	1
Feeling closer/belonging	1

Source: Own work (2023).

Just as in the previous question, all responses to this one were also positive, allowing for reflection on the project's contributions to the academic and professional

development of each individual subject. Analyzing the responses and the number of occurrences, it is clear that the former are interrelated, as there is an improvement in "shyness"; consequently, there is an evolution in communication and greater personal development.

Despite appearing only once, the response "feeling closer/belonging" carries significant weight for this work, as it explicitly demonstrates the importance of the outreach projects offered by the university. Through these projects, many students are motivated to continue their studies, since contemplating the possibility of abandoning the course consequently leads to withdrawal from the project(s), as reported by one of the subjects (Subject 7).

It is possible to infer that many of the positive aspects highlighted are due to the methodology the project employs, which is theater. The use of this methodology is beneficial not only for the play's audiences but also for the students who perform it (Silva et al., 2018).

Theater is recognized as one of the most effective means of communication and expression, standing out for its exceptional ability to promote freedom of speech. Through the stimuli provided by theater workshops, students have the opportunity to cultivate their personal freedom. This translates into sincere and valuable contributions they bring to the classroom, enriched by development through interaction and communication games (Ramiro, 2021). Furthermore, theater can also play a role in enhancing students' writing and public speaking skills (Martins; Fernandes, 2020).

Some of the interviewed students were present from the inception of the project, meaning they actively participated from the creation of scenarios and development of characters, up to the final presentations before their graduation. Costiche (2019) apud Frare et al., (2021, p. 3) states that "this play was conceived as a way to unite scientific knowledge and imagination," thus requiring the creativity of the students participating in the project to not only unite such knowledge but to do so in a way that it could be transmitted to the audience.

Analyzing the other contributions of the project, it was verified that such characteristics align with what was proposed by Moral-Barrigüete and Guijarro (2022): the development of key competencies (oral language, diction, gesticulation, posture)

essential for future professionals, who will have to deal with diverse audiences, such as: students, co-workers, supervisors, coordinators, and principals.

Aligned with the professional aspect and question number four, the fifth question aimed to verify the participants' work in their field of study. The question and its respective categories can be found in chart 5.

Chart 5 - Occurrences of responses to question 5: “Do you work or have you worked in your field of study?”

CATEGORY	NUMBER OF OCCURRENCES
Works/worked	5
Do not work/Did not work	4

Source: Own work (2023).

Despite almost half of the interviewees not having worked and/or not currently working in their respective fields of study, the reason why these students are in areas different from those pursued at university was not identified. Only one student reported that their sole experience working in the field, teaching, occurred during mandatory internships, which take place in the 7th and 8th semesters of the course.

It was also possible to perceive from this question that most students relate "working in their field of study" solely and exclusively to "teaching." Which is somewhat misleading, as, according to the PPC, one of the characteristics of the graduate's profile is: "To be and feel prepared to pursue postgraduate studies if so desired" (UFPR, 2020, p. 12), which is considered acting in their area of formation. After the explanation, two of the nine interviewed students "corrected" their answers, changing from "no" to "yes."

The sixth question asked students about the benefits the project brought to their personal lives and if they could identify them. The answers can be seen and analyzed in chart 6.

Chart 6 - Occurrences of responses to question 6: “In your opinion, has the “Show das Ciências” project had a positive impact on your personal life? Can you identify any specific benefits?”

Part A:	
CATEGORY	**NUMBER OF OCCURRENCES**

Yes	9
No	0
Part B:	
CATEGORY	**NUMBER OF OCCURRENCES**
Improved communication	4
Friendships	2
Loss of various fears/shyness	2
Teamwork/cooperation	2
Discovering new schools realities	2
Dealing better with “no” and adversity	1
Spontaneity	1
Development of new skills	1
Emotional intelligence/self-control	1
Greater contact with students	1

Source: Own work (2023).

All interviewees unanimously agreed that the project had a positive impact on their personal lives. These impacts were highlighted in the second part of the question and are of great importance, not only for the personal lives of each of the members, but also for their social and professional lives (Manchur; Suriani; Cunha, 2013).

Regarding the same outreach project, Silva et al. (2022) state that "the growth occurred in several aspects, and the loss of shyness and the development of the ability to speak in public with ease was essential for our formation," which positively aligns with our research. Thus, it is possible to affirm that the project made significant contributions to the development of the individuals who participated in it.

This can be observed in the report of Subject 3: "everyone who participated contributed in some way, these are life experiences, these are debates, it [the project] made me a more uninhibited person..." (Subject 3), which aligns with what Costa (2004) proposed: "with the theater/drama methodology, there are possibilities for us to penetrate new possibilities of interaction and communication.".

Connecting questions 4 and 6, it was possible to identify some similarities in the responses, highlighting that these contributions endure not only in the students' academic and professional lives but are also carried into their personal and social lives.

Silva et al. (2022, p. 269) state that: "At first, this project presented itself as a challenge for all of us." What is a justification for some of the reports, such as that of Subject 5, who experienced "initial difficulty, due to shyness" (Subject 5). However, responses such as “the ‘Show das Ciências’ enabled me to express myself more, to lose my fear of the audience, of the stage, of the classroom…” (Subject 4) lead us to believe that the project, in various ways, did indeed contribute to the development of these students.

As stated, the contributions are not limited to personal life, but also to academic and professional life, given that when analyzing the context of university outreach projects, especially for undergraduate degree courses, as Manchur et al. (2013, p. 335) state: “outreach favors direct contact for the development of teaching practice, which enables the development of teaching methodologies that enhance their academic training.” Subjects 3 and 6 confirm what the authors state: "it contributed to my body language, to some knowledge, ways of approaching certain content in the classroom during the internship part" (Subject 3); "... and also always using experiments to relate theory, practice, and historical contextualization" (Subject 6).

Another way to highlight what Manchur and collaborators (2013) present is to analyze charts 5 and 7, which show the responses "loss of fear of the classroom" and "improvement in communication." This demonstrates how interconnected the contributions are, because if the student loses the fear of being in front of the class, consequently, they will have better communication with other students, better development, more self-control, and a better command of their body language.

These contributions largely arise from the opportunity for contact with students before the internship period. "Given that playfulness and art encompass the political, the affective, the aesthetic, ethics, critique, and 'wholeness' in human relationships" (Costa, 2004, p. 96), in other words, the development of these abilities, so to speak, is not solely the exclusive domain of university extension in isolation, but rather of this interconnectedness with playfulness, art, and theater (Costa, 2004; Reverbel, 1974).

Arantes et al. (2023) start from the idea that: "a) outreach activities make an important contribution to the education of undergraduate students by enriching their experiences in contact with contemporary realities beyond the university walls," and, more than just agreeing with the previous authors, they bring possible justifications for the answer "to know new school realities," mentioned twice by the students. This aligns

with one of the specific objectives of the "Show das Ciências" outreach project, which is "to promote dialogue between academia and society" (UFPR, 2018, unpublished, unpaginated). By stating that students became acquainted with new realities, it is possible to infer that there was a dialogue between these students and society. This contact became more evident in presentations at events, given that during October 2018, approximately one thousand people attended the project, for example, at the Feira de Ciência e Tecnologia [Science and Technology Fair] (FECITEC) held in the city of Palotina (Costiche et al. 2019).

By comparing the answers obtained during the interviews with Table 1, it can be verified that the answers are consistent with the expected aspects for the graduate profile of the LCE course at UFPR Palotina Campus. These comparisons can be seen in Chart 7:

Chart 7 - Comparison of aspects of the Graduate Profile with the categories.

Aspects of the graduate profile	Category(ies)
To be capable of effectively managing the classroom environment, prioritizing and teaching how to prioritize the use of time and collective resources for the effective construction of knowledge, scientific languages, and concepts.	• Overcoming the fear of classroom • Ways of approaching knowledge • Development and planning
To understand scientific and technological knowledge as a result of human construction, being aware of how the Exact Sciences have been built, their origins, creation processes, and insertion into other areas of knowledge.	• Ways of approaching knowledge
To be familiar with the theoretical conceptions that underpin teaching actions, in order to conduct the learning process in a meaningful and effective way, given each specific content and each particular class of students, being prepared to evaluate the results of their actions through different paths, in an interdisciplinary perspective.	• Development and planning • Respect for others • Ways of approaching knowledge • Discovering new schools realities
Demonstrate a capacity for continuous learning, acquiring and utilizing new ideas, and leveraging technological and communication tools to create and adapt pedagogical methods to one's work environment, thereby transforming the practice of teaching into a process of self-formation.	• Personal development • Curriculum development • Development of new skills
To be capable of reflecting, critiquing, proposing, evaluating, and leading new work proposals specific to their field in order to collaborate with the development of knowledge and the teaching of Exact Sciences.	• Improved communication • Ways of approaching knowledge • Loss of shyness
To have a critical view of the teaching of Exact Sciences that allows them to articulate, interact, and systematize	• N/A

phenomena in order to evaluate proposals and didactic materials, structure courses and teaching topics, using scientific language in its different representations.	
Interact in an articulate manner with professionals in your area of knowledge and teaching, and from other areas, in order to effectively contribute to proposals for improving your social and professional environment, fostering a multidisciplinary and significant approach for your students.	• Improvement in interpersonal development • Emotional intelligence/self-control • Teamwork/cooperation
To be and feel prepared to pursue postgraduate studies if desired.	• Two of the research subjects stated that they had pursued an academic career.
Ability to analyze and solve complex problems, as well as to teach these skills to their students.	• Improved communication • Ways of approaching knowledge
To perceive the difficulties of their students, including the less favored, and to act to help them overcome these difficulties within a context of comprehensive education.	• Development and planning • Respect for others
To be able and motivated to act in the formation of future citizens capable of exercising this citizenship with discernment and ethics, in order to contribute to the development of the community in which they are inserted.	• Development and planning • Respect for others • Loss of shyness

Source: Own work (2023).

To conclude the interviews, one final open-ended question was posed to encourage participants to respond spontaneously. The question allowed them to comment on the project and mention any points that had not been addressed. Of the interviewees, only one declined to comment. Chart 8 presents the comments from the eight individuals who not only recorded their remarks but also expressed their feelings about the project.

Chart 8 - On any point that was not addressed during the interview?"

STUDENT	RESPONSE
1	"The project was and still is very important to me and it should continue."
2	"It is a really cool project that I would recommend to anyone who wants to participate in the project."
3	"I just hope that the project continues for a long time, that people get interested and see how cool it is, that when I become a teacher I can bring my students to see the 'Show das Ciências' and tell them I was part of its creation."
4	"The project has only brought benefits, not only for children, but first and foremost for those who are carrying them out."
5	"The project was an incredible idea from the teachers [...] participating was a unique opportunity, I hope it continues."

6	“You have to tell [teacher] A to never stop doing this project, because it is a really good thing she’s come up with.”
7	“I think this project cannot die; it has to be continued with other students [...] it changed my life, my perspective, my perception of science, of community.”
8	“I can only express my gratitude to the project, to everyone who participated, and to the coordination team for being willing to organize all of this.”

Source: Own work (2023).

After analyzing the responses of the interviewed subjects, it was verified that out of 8, 5 suggested the continuation of the project, which indicates that this was a milestone in the lives of each of them, even those who (explicitly) did not suggest the continuation of the project, considering all the comments made.

Attached to this fact, it is necessary to emphasize the importance of outreach projects during undergraduate studies to enhance the formation of undergraduates. This potential is applicable to all higher education courses; however, for undergraduate Bachelor’s degrees, it is given greater weight due to the development of the skills reported throughout the interview (Garcia, 2012). And, with regard to the "Show das Ciências" outreach project, it is pertinent to state that it is of paramount importance in the aforementioned aspect, considering all the benefits it has left, not only the reported contributions, but also "curriculum development, article publication, book chapter, event proceedings" (Subject 8).

Regarding the publications produced during the project, we can mention:

1. Paper presented at the IV Semana Acadêmica De Licenciatura em Ciências Exatas [4th Academic Week of the Undergraduate Program in Exact Sciences]. Show Das Ciências: Do Laboratório Para Os Palcos [From the Laboratory to the Stage]. 2018.
2. Article published in the journal "A Física na Escola" [Physics at School] (Online). Dramatização e Experimentação como Recursos Didáticos para o Ensino e Divulgação de Ciências Naturais [Dramatization and Experimentation as Teaching Resources for the Teaching and Dissemination of Natural Sciences]. 2019.
3. Video: Show das Ciências. 2020 (Video script for the play).
4. Comic book. Show Das Ciências: Agora em Gibi [Now in Comics]. 2021.
5. Paper presented at the VII Congresso de Extensão Universitária da UFABC [7th University Outreach Congress of UFABC]. Da Sala De Aula

Aos Palcos: Experiências Do Projeto De Extensão “Show das Ciências” [From the Classroom to the Stage: Experiences from the Outreach Project “Show das Ciências”]. 2021.

6. Book chapter: Manual Dos Experimentos Do Show Das Ciências [Manual of Experiments of the Show das Ciências]. In: Diogo Lopes de Oliveira; Leonardo Pereira Tavares. (Eds.). MANUAL DOS EXPERIMENTOS DO SHOW DAS CIÊNCIAS. 2021.
7. Article published in “Extensão em Foco”: A linguagem teatral na divulgação científica: Experiências e desafios no âmbito da formação de docentes [Theatrical Language in Science Communication: Experiences and Challenges in Teacher Education]. 2022.

In addition to the 7 products, as reported, the importance of the "Show das Ciências" outreach project is noticeable, given its contributions to the training of undergraduates in the LCE course at UFPR, Palotina Campus.

FINAL CONSIDERATIONS

The obtained data indicate that the project in question played a fundamental role in the development of the students, encompassing academic, professional, personal, and social areas. Compliance with 10 out of the 11 expected aspects for the graduate profile in the PPC not only highlights the effectiveness of the project in meeting established expectations but also underscores its importance as a means of providing quality education.

Furthermore, the contribution to curricularization highlights the project's alignment with current trends in higher education, comprehensively preparing students for both academic and professional challenges. In this context, the research conducted validates not only the program's compliance with educational principles but also highlights its significant impact on student development.

The stipulated objectives were fully achieved. The collection of testimonials from former students regarding their participation in the "Show das Ciências" project was comprehensively conducted, involving diverse perspectives to obtain detailed information on their involvement in the project. The categorization of these reports, through content analysis, provided a deep understanding of the participants'

experiences, as separating the responses into categories allowed for the perception of similarities between the responses and the literature. The correlation of these reports with the Graduate Profile, as planned by the PPC, evidenced the contribution of the project to the design of the predefined educational objectives.

Furthermore, identifying the project's contributions to the training of graduates reinforces the beneficial and lasting impact of the "Show das Ciências" on academic and professional advancement of the students. These developments confirm the project's effectiveness in achieving its goals and enhancing the participants' training.

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