

# International Journal of Human Sciences Research

Acceptance date: 28/10/2024

## IETEC - EDUCATIONAL INCUBATOR OF SOCIAL TECHNOLOGY AND SCIENCES: THE EXPERIENCE OF INTERDISCIPLINARY EXTENSION

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**Abstract:** IETEC (Educational Incubator for Social Technology and Sciences) is an interdisciplinary extension project designed to address the need to inform the population about social technologies (ST) and the solidarity economy, developed at the Federal Technological University of Paraná. The project therefore aims to develop training and research practices on the need for information and the implementation of Social Technologies in school communities in formal and informal environments. The project uses the interaction between science, technology, society and the environment to formulate and develop its actions, so it was and is possible to make information available through lectures, the preparation of pedagogical notebooks and actions to implement the technologies, reaching from children to adults, in school environments or in the community in general. The actions carried out by the project aim to reach the population in an effective and easy-to-understand way so that the information reaches everyone. The involvement of teachers and students on grants and volunteers, as well as providing information through extension, is important to remember for academic growth in relation to the training of science and biology teachers.

**Keywords:** Education, Society, Technology

## INTRODUCTION

With technological advances evident in society, it is clear that questions are being asked about studies relating to science, technology and society. It is worth pointing out that education linked to these questions about quality of life and the environment has a high transformative power in the community and the project in question works on these strategic points of scientific, social and technological education. Population and technological growth make it necessary to think in a more sustainable and humane way, so there is a great environmental and social need, which is why social technologies are necessary.

The IETEC project came about as a result of a 2017 extension project and one of its aims is to better integrate research and extension activities with the pillars that already exist within the teaching process, leading to new knowledge, with concrete reality as the object of investigation, interaction and debate, resulting in the production of scientific knowledge. In this way, we can see the indispensable relationship between Extension and Research for social, technological, scientific and cultural issues that can be addressed in the future, thus demonstrating the real importance of the educational role in the search for democratic paths.

With various actions aimed at formal and non-formal educational spaces, the project aims to popularize science and technology on an ongoing basis, involving the phases of the Interdisciplinary Laboratory for the Training of Educators (LIFE) and TESLA (Social Technology, Sustainability and Education with Interdisciplinary Pedagogical Material in Basic Education), using certain actions, such as the training of LIFE educators, which make it possible to systematize these actions, making it possible or not to demonstrate how an educational Incubator works in formal and non-formal spaces, capable of addressing various themes during a continuous training process. The projects have a broad focus on the fields of social technology, sustainability, science and education, naturally focusing on environmental education, natural sciences and biology.

In this sense, the Incubator takes the form of linked projects, as well as ongoing dialogue with the community through actions that lead to knowledge of ST in formal and non-formal education spaces, so that the community becomes autonomous in building ST alternatives in their educational spaces. In this sense, the Extension project is only a space for mediating between popular knowledge and scientific knowledge, and helping to popularize science and technology.

The field of social technology has become increasingly common, as it is seen as one of the main solutions to the problems caused by disastrous and unbridled technological progress, which has resulted in serious environmental and social imbalances. It is from this context that actions have emerged that have been carried out by the population itself, most of whom are in vulnerable situations, resulting in immediate solutions to local problems.

To establish an educational methodology that has the capacity to connect with the local reality, contributing even more to the practices of a solidarity economy. In line with these actions, the project has the premise of continuously implementing practical interdisciplinary training for both the external and internal communities, in order to organize and link social technologies with the most diverse areas of science, thus building an egalitarian and democratic education. The project is also based on rethinking actions that, for the advancement of technology, culminate in incoherent and/or unrealistic practices for society and the environment in which it currently finds itself. Information is a strategic point for the formation of a more critical society, as an educational resource, as pointed out by the Banco do Brasil Foundation (2004, p. 137)

Information is a precious resource and a powerful rationalizer of social activities. What is also precious is our limited attention span, which today is flooded with huge amounts of information clutter that disorients us. In the absence of articulated information to enable informed citizen action, we generate passive and distressed people and economic initiatives with no future. Information is a gigantic underused resource.

It is very important to highlight some questions that need to be asked so that the relationship between social technologies, science and education can be understood in the best possible way. Which science do we

want to educate for which society? Which model of society do we want to build on the basis of technological progress?

Social technologies are applied methods and techniques that interact with the community and generate real solutions for social transformation. Otterloo (2009, p. 27) states that “It is possible to define ST as a way of creating, developing, implementing and managing technology aimed at solving social and environmental problems, generating social and economic dynamics for social inclusion and sustainable development”. Technical-scientific knowledge associated with popular knowledge is essential in non-formal education, unifying the dialogues of knowledge without imposition. In this way, technology can develop in these spaces greater technological, educational and scientific progress, greater inclusion and democracy in the region through a study of social technology, integrating the Social Studies of Science that can be carried out according to the reality of each region.

These questions lead us to some points that should be raised when it comes to the meaning and function of the sciences, the studies in Science, Technology and Society (STS) that have progressed considerably in the last ten years and point to an urgent need to question the standard of science that is linked to a more social and humanized vision, in order to become a more critical, social and political science in the formal and non-formal spaces to which it can be applied.

According to Auler and Delizoicov (2006, pg 341) “it is understood that, for a critical reading of reality, a critical understanding of the interactions between STS becomes increasingly fundamental, considering that contemporary social dynamics are strongly marked by the presence of ST. “ It is from a greater integration of fields of knowledge and actions that we move towards a science that is more humanized but at the same time more socially responsible, resulting in great benefits in various areas.

It is in this context that the development of an extension project that integrates the relationship between technology and society comes to help in this humanized training in science and technology at a technological university, involving undergraduates from degree and engineering courses.

The importance of transmitting knowledge and information about social technologies, which are an important step towards a more critical society, Otterloo [et al.](2009, p.83) states that

Spreading knowledge enriches everyone, because whoever passes on knowledge, unlike material goods, does not lose it. In economic terms, knowledge is a so-called good and its use does not reduce the stock. On the contrary, since knowledge is a social construction, it tends to expand it.[...] The new technologies not only generate knowledge, but also allow it to be transmitted cheaply and universally. Democratizing knowledge has become simple.

The objectives are to carry out training, interdisciplinary practices and research into social technologies for the general community, thus achieving a more supportive, egalitarian and democratic education, in defence of socio-environmental sustainability and humanized science and technology. The project presented also extends into the field of some of the Sustainable Development Goals because of some of the aspects addressed throughout the goals, such as SDGs 6 and 11, or 16 and 17, which encompass not only the relationship with Science, Technology and Society, but also the materials developed for schools and other educators that make it possible not only to cover various subjects at various educational levels, but also to discuss them in accordance with the reality of the school where the project is being implemented.

## MATERIALS AND METHODS

IETEC's extension project aims to advise the projects it integrates, such as Life, Tesla, UTorta, ConscientizaÇÃO, SolidarizaÇÃO. It acts as an educational incubator in the project phases with formal and non-formal education spaces, transmitting the content developed in a process of continuous training. The focus of the projects involves social technology, sustainability, science, education and environmental education.

As one of the objectives and the relationship between the external community and the academic community, a website was created to facilitate communication and access to the activities developed in IETEC's extension projects. The site was developed on the Wix platform, which explains all the extension projects linked to IETEC and updates them regularly.

In other phases of the project, there was participation and collaboration with RIU-PR (Network of University Incubators for Supporting and Fostering the Solidarity Economy and Social Technology), in lecture activities with the community and thematic production in the areas developed by the incubators.

In the current phase, due to the global scenario caused by Covid-19, it was decided to develop a thematic notebook in which research, systematization and organization were carried out involving new social technologies for use with the community in general.

The methodology used in this booklet was bibliographical research based on reading and synthesizing and analyzing experiences of social technology, with themes relating to social technology and the fight against violence, social technology and information technology, social technology and sustainability, social technology and inclusion, obtained from the Banco do Brasil Foundation database, as well as two IETEC projects, Tesla and Uthorta.

## RESULTS AND DISCUSSIONS

In order to develop the website, meetings were held to systematize the content that would be included on the site, such as photos and slides of the projects, as well as a brief analysis of which platform would best suit the site. This creation integrates the principles of popularizing science and technology and, mediated by the new information and communication technologies, bringing the knowledge of Social Technology to the community in general.

*Wix* is an online platform where anyone can create their own website without any design or programming skills, completely free of charge. On the website, under the “who we are” tab, there is a brief explanation of what the project is about, as well as a presentation of the entire team, including scholarship holders and volunteers. The projects explained on the site are *Life*, *Tesla* and *Uthorta*, where there is an explanation of what each project is about with photos of the events held and participations, as well as the cover of the notebook developed by *Uthorta*, in addition to an “events” tab where lectures and events from established partnerships are publicized.

RIU-PR has collaborated on joint actions between public universities and participated in events and lectures. The development of educational material, such as the *Caderno Pedagógico de tecnologia social*, is focused on the general population, but can also be used by teachers, schools, students and others.

The pedagogical notebook entitled “Brief analysis of social technology and education - a look from the virtual environment” is being developed through bibliographical research based on reading and synthesis and analysis of social technology experiences. Each chapter summarizes, analyzes and discusses the use of these social technologies and how they interfere in the social environment, multiplying good actions and often changing the local reality where the projects are developed.

## CONCLUSION

With the passage of time, it has become increasingly clear that the environment in which we live is changing every day. In this sense, we know that the environment is being devastated, and so, consequently, is the quality of life. Life in society is also an important point to discuss, since social injustices are evident. In this sense, education and information are crucial, since they are the source of transformation of a reality, and this is an important point to be worked on in the extension: alternative and effective means of bringing information and education, as well as the implementation of technologies, in order to bring benefits to the environment and the population living there.

The inclusion of extension in the academic environment is a big step for the university's dialog with the community in general, and this is also part of the importance of developing educational practices. IETEC as an extension, as well as its integrating projects, is often the starting point in generating discussions about technology and society, boosting education and the formation of more critical thinkers, within the reality to which the individual is inserted.

Although there are many challenges, extension is an important step towards making science a great source of change, which, together with technology, will become a great shaper of critical thinking, education and the transformation of individuals and the environment in which they live.

In the process of developing the notebook, it was extremely important to develop this learning about how social technology is developed and integrated and how it brings about social change in the community in which it is developed. The dissemination of CTS knowledge is increasingly important for academic learning. Through the development of these practices, it was possible to experience the reality of different communities and witness

the importance of university involvement in communities that are often simple and have little access to these technologies.

We would also like to thank the coordination of this project, which makes the experiences and lessons learned possible.

## ACKNOWLEDGMENTS

We would like to thank the Ponta Grossa Campus Extension Board for the grant and emphasize the importance of the Federal Technological University of Paraná for initiating young people into the sciences and for free, high-quality education.

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