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Contributions of the university outreach to the construction of knowledge in food and nutrition security

Contribuições da extensão universitária para a construção de conhecimento em segurança alimentar e nutricional

Elaine Martins Pasquim[1]
Elisabetta Recine[2]

[1] Universidade de Brasília, Faculdade de Ciências da Saúde, Departamento de Nutrição. Brasília-DF, Brasil.

[2] Universidade de Brasília, Faculdade de Ciências da Saúde, Departamento de Nutrição. Observatório de Políticas de Saúde Alimentar e Nutrição. Brasília-DF, Brasil.

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Correspondence
Elaine Martins Pasquim
E-mail: elaine.pasquim@gmail.com

Abstract

Reflection on food and nutrition security from the perspective of university outreach contributes to the understanding about the construction of knowledge in this area, in the relation between university and society. The objective of this study was to identify elements of different paradigms of science in the construction of knowledge in the outreach in food and nutrition security. Proposals financed by the Brazilian National Outreach Program of the Ministry of Education of Brazil were identified. Content analysis was carried out, considering the following empirical categories: principles of outreach, focus of outreach projects, relationship with society, instruments/ strategies used. Most of the proposals analyzed intend to promote dialogue between scientific and popular knowledge, in an interdisciplinary way, with social commitment, in interaction with multiple actors and with public policies, promoting the sustainability and development of social technologies. However, it can be seen that different paradigms coexist in this outreach area. Some proposals express a more linear vision in the relation of science and technology with society, as initiatives that aim at the transmission of knowledge and technology. Outreach can foster science in food and nutrition security committed to dialogue and reduction of inequalities, but it is still necessary for universities to deepen their reflections on the principles that guide their practices, regarding the approach of science and technology used, the type of technological development expected and the relationship with society.

Keywords: Food and Nutrition Security. Higher Education. University Outreach.

Resumo

A reflexão sobre a segurança alimentar e nutricional a partir da extensão universitária contribui para a compreensão sobre a construção do conhecimento nesta área na relação entre universidade e sociedade. O objetivo deste estudo foi identificar elementos de diferentes paradigmas da ciência na construção de conhecimento na extensão em segurança alimentar e nutricional. Foram identificadas propostas financiadas por editais do Programa Nacional de Extensão Universitária do Ministério da Educação. Realizou-se análise documental, considerando-se as seguintes categorias empíricas: princípios da extensão, foco dos projetos de extensão, relação com a sociedade, instrumentos/estratégias usadas. Grande parte das propostas analisadas explicita o objetivo de promover o diálogo entre saberes científicos e populares; de modo interdisciplinar; com compromisso social; na interação com múltiplos atores e com políticas públicas; promovendo a sustentabilidade e o desenvolvimento de tecnologias sociais. Aproximam-se, em geral, de uma abordagem de ciência para o bem da sociedade. Entretanto, percebe-se que paradigmas diferentes convivem na extensão na área. Algumas propostas expressam uma visão mais linear na relação da ciência e tecnologia com a sociedade, como iniciativas que visam à transmissão de conhecimento e tecnologia. A extensão pode favorecer uma ciência em segurança alimentar e nutricional comprometida com o diálogo e redução de desigualdades, porém, ainda é necessário que as universidades aprofundem as reflexões sobre os princípios que orientam suas práticas, quanto à abordagem de ciência e tecnologia, ao tipo de desenvolvimento tecnológico esperado e à relação com a sociedade.

Palavras-chave: Segurança Alimentar e Nutricional. Educação Superior. Extensão Comunitária.

Introduction

In 1987, the Fórum de Pró-reitores das Universidades Públicas Brasileiras (Forum of Pro-Rectors of Brazilian Public Universities - Forproex) defined that "university outreach is the educational, cultural and scientific process that articulates teaching and researching in an inseparable way, and enables the transformative relationship between University and Society".[1] This concept of university outreach is compatible with Boaventura de Sousa Santos' proposal for a science capable

of valuing experiences, building knowledge capable of transforming the world, through a real dialogue between voices emerging from the territories and academic groups engaged.[2] It is also congruent with Minayo's proposal,[3] when stating that:

> Acting in social projects means empowering changes in the essential spheres towards the universal values of human development (...). The reflection begun here (...) combines with the transformations at the level of individual consciousness and with the changes of the collective processes.

For Velho,[4] there are four paradigms of science, namely: (1) science as the engine of progress; (2) science as solution and cause of problems; (3) science as a source of strategic opportunity; (4) science for the good of society. For each paradigm, dominant concepts of science are involved, which include: who produces knowledge, relationship of science and technology with society, logic and focus of science, technology and society policy.

The idea of science as the engine of progress had its culmination in the period between the post-World War II and the early 1960s. The centrality of this conception is based on the vision of autonomy and historical and social neutrality of science. Scientists are those who produce knowledge in order to ensure that it is free of social values and influences. In this case, the relationship with society is linear, because everything starts from science, which generates technology and, finally, social benefit. The focus is the strengthening of the research activity by individual projects of free choice of the researcher submitted to the Research Councils. Thus, peer evaluation is considered sufficient, and there is no need to account for society.[4]

Science as a solution and cause of problems involves the social movements generating questions about the neutrality of science. The production of knowledge is still the responsibility of scientists, but they must do so in groups, in order to foster the articulation of fundamental knowledge in order to understand a complex reality. Although the issues to be addressed must respond to problems relevant to society, the focus is the market and technology policy. In this sense, the main influencing element is the business demands. Companies are the ones with the knowledge and skills to judge what kind of science is needed. Thus, in this paradigm, science is still linear, but the focus of scientific development is influenced by the prioritization made by the productive sector. The peer review is still central.[4]

Science, as a source of strategic opportunity, conceives it as a social construction. The production of knowledge occurs in the relationship between multiple agents (companies, hospitals, NGOs, besides the academic system), in a transepistememic community. There is no separation between science and technology, and society. Science is no longer produced in a linear way, and there are multiple actors to decide on the evaluation of scientific and technological policy. The focus is on

innovation policy. For example, research and development activities in companies are funded. There is a broadening of peer review, including actors from outside academia, and with social and economic impact analyzes.[4]

Science for the good of society is a paradigm that is still under construction, and which admits that there are multiple forms of knowledge. Science is culturally situated and built, incorporates local knowledge, making room for national and universal visions. It results from a collective production (participation of multiple actors, in networks of variable configuration, predominantly interdisciplinary) with their moments of conflicts regarding the meeting of a diversity of knowledges. The focus is on social welfare, but for this, science and technology policy must support multi-stakeholder connectivity to ensure social participation. There are mechanisms for evaluating social impacts with social participation, in addition to systemic assessments.[4]

Although each of these paradigms has developed in different historical periods, we can still perceive the presence of elements of all of them. Each scientific subject, in the practical action that develops, contributes to the elements of these paradigms express themselves or not. For example, the evaluation tools currently used by research promotion agencies tend to be from previous paradigms.[4]

The process of constructing knowledge to transform oneself and reality passes through the challenge of integrating lived experience with actions in social practice. These challenges are shared by the Segurança Alimentar e Nutricional area (SAN - Food and Nutrition Security). This consists of guaranteeing the human right to adequate food through healthy, culturally respectable, socially, economically and environmentally sustainable food practices and that do not interfere with other rights.[5] In this sense, the SAN area is a complex one and presents several structural challenges to be faced, such as: expanding and strengthening sustainable food production systems; The increase of overweight and chronic non-communicable diseases; Ensuring physical and financial access to healthy food for the whole population; The food and nutrition insecurity of traditional populations, first nations and other groups.[6]

Therefore, the university outreach in the area of Segurança Alimentar e Nutricional (SAN - Food and Nutrition Security) brings with it the challenge and the possibility of a path for the construction of shared knowledge, aimed at individual and collective transformation, in the articulation between different knowledges and practices.

During the National Seminar on Research in Food and Nutrition Security held in 2012, Costa Gomes' speech portrays how the construction of knowledge and technology can articulate different knowledges in the SAN area.[7]

> Popular wisdom has relevant value and must be recognized, although it is not produced in an academic-scientific context. There are many useful technologies produced by research or conventional science. The knowledge of farmers and the experience of technicians can mean a new style of knowledge, not the substitution of one knowledge for the other. (...) It is necessary to defend the valorization of the agrobiodiversity in Brazil and the associated knowledge.

The construction of knowledge in the SAN area is addressed in the Brazilian National Policy on Food and Nutrition Security (PNSAN), instituted by Decree No. 7,272, of 2010, where one of its guidelines is the establishment of "permanent processes of food and nutrition education, research and training in the areas of food and nutrition security and the human right to adequate food."[8]

The second Brazilian National Plan for Food and Nutrition Security (2016-2019) reinforced the importance of actions related to research and outreach in Food and Nutrition Security in relation to the strengthening of the SAN System of Brazil:[6]

> In addition to strengthening the components of the System, it is important to promote the goals and actions related to research and outreach in SANs, to training for the DHAA [direito humano à alimentação adequada] (human right to adequate food), to the construction of mechanisms for enforcing the DHAA and to improving the system and indicators of the PNSAN.

From the SAN projects and programs presented to the Programa Nacional de Extensão Universitária (Proext - National Extension Program), it is intended to discuss, based on the practice referenced in the SAN, how outreach contributes to the construction of knowledge and what are the assumptions for this construction.

Objectives and Methodology

The objective of this study was to identify assumptions related to the paradigms of science for the construction of knowledge in the proposals of outreach in SAN, financed by the Programa Nacional de Extensão Universitária (Proext – Brazilian National University Outreach Program).

The projects contemplated were identified in the calls for proposals of Proext 2011, 2013 and 2014, which contained the term "food and nutrition security". The Proext calls for proposals, its results and support materials are available on the website of the Ministério da Educação (Ministry of Education of Brazil). The proposals of the educational institutions are stored in the database of the Sistema de Informação e Gestão de Projetos (SIGProj - Information System and Project Management), which was requested access to the Ministério da Educação (Ministry of Education of Brazil).

After the initial identification, the titles, thematic lines, sub-themes that related to the different dimensions foreseen in the concept of food and nutrition security were read, according to the Lei Orgânica de Segurança Alimentar e Nutricional (LOSAN - Brazilian Organic Law of Food and Nutrition Security), Law nº 11.346 / 2006.[5] These proposals were then opened in the Ministério da Educação e Cultura (MEC - Ministry of Education and Culture of Brazil) web system in order to read the full text of the proposals. Only those that contained the term "food and nutrition security" in the body of the text, title, thematic lines or sub-themes were separated for analysis. With these criteria, 116 proposals were selected for documentary analysis through content analysis.

According to Cellard,[9] documentary analysis is a method of collecting data by means of documents. For this article, the conception of document or "source" is adopted as being, according to a more globalizing approach to social history, all that is vestigial of the past, all that serves as a testimony. They are explored (and not created) sources in a search procedure. The phases of content analysis encompass: pre-analysis; examine of the material; and systematization of results: inference and interpretation.[10] The parameters and axes of analysis of the documents were made according to Velho[4] on the paradigms of science. The author understands that the focus, instruments and forms of management that define science, technology and innovation policy at a given time are closely related to the dominant concept of science. Thus, in this study, the following empirical categories were analyzed in Proext projects and programs: principles of outreach in SAN; Relationship with society; Outreach focus in SAN; Tools / outreach strategies in SAN.

The principles of outreach in SAN were systematized according to the following empirical categories found in the analysis of the documents: dialogue with local knowledge, interdisciplinarity, valorization of environmental diversity / environmental ethics.

Regarding the relationship with society, we considered the influences to build knowledge, including articulation with public policy, the relationship with multiple actors and the articulation with the productive sector.

The focus of outreach was analyzed according to the categories of social commitment / social transformation (role of educators and learners acting in the search of transformation from reality to social welfare) and innovation (based on the Government-University-Industry relationship).

And, finally, the tools / strategies of the outreach proposals in SAN were categorized according to community participation in the construction of knowledge and transmission / diffusion of knowledge from academia to society.

The research was approved by the Comitê de Ética em Pesquisa da Universidade de Brasília (Research Ethics Committee of the University of Brasília), with the issuance of Opinion N. 788,097, in compliance with National Health Council Resolution 466, of December 12, 2012, as it was included in a more detailed study which provided also the primary data.

Results

Initially, it should be noted that among the 116 proposals analyzed, the majority were from the Northeast region of Brazil (over 40%), followed by the Southeast region (24%) and the South, Central West, North regions (each with about 10%). In 54% of the teams there were professionals from two to three areas of knowledge, indicating some level of multidisciplinarity.

The proposals indicated the relationship with a great diversity of social groups, the main one being small farmers (52%), followed by basic education students (27%). In the "main subject areas" field, completed by professors in the SAN projects and programs, the following stand out: 22% "health", 18% "work", 15% "environment", 14% "education" and 3% "human rights and justice". Interaction with sectors or institutions other than communities and the internal public occurred with municipal government (71%), state government (56%), federal government (49%), social movements (54%), non-governmental organizations (40%), Unions (40%), private institutions (19%).

Approximately 90% of the outreach proposals in SAN funded in the three calls for proposals related the intention of approaching academia-society through dialogue and / or exchange of knowledge.

Table 1. Principles identified in the proposals for outreach in Food and Nutrition Security of Proext. Brazil, 2011, 2013 and 2014.

	Proext 2011 (Qtd/%)	**Proext 2013 (Qtd/%)**	**Proext 2014 (Qtd/%)**	**Examples**
Principles				
Dialogue of knowledge with local knowledge	28 (90.3%)	30 (88.2%)	46 (90.2%)	To identify and consider the social determinants of health and the existing perceptions about the illness processes, to develop an exchange of technical-scientific-popular knowledge between academics and community members associated to the development of the programmatic actions of health education. Proext 2014, IES [Instituição de Ensino Superior] (Institution of Higher Education) Amazonas.

to be continued

	Proext 2011 (Qtd/%)	Proext 2013 (Qtd/%)	Proext 2014 (Qtd/%)	Examples
Interdisciplinarity	26 (83.8%)	29 (85.3%)	43 (84.3%)	It will continue its general strategy of knowledge production (research) in different areas, themes and aspects of reality (solidarity economy, gender relations, finances, ethical, responsible and solidarity consumption, access to citizenship rights, food and nutrition security , waste and recycling), seeking integration with other areas of knowledge (popular education, agroecology, housing, environmental sanitation, collective health, etc.) simultaneously with intervention (outreach) in social reality with training (teaching) of students from different courses and levels and participation of various types of professionals (architecture, ecology, psychology, sociology, engineering, physical education, nursing, occupational therapy, economics, biology, etc.). Proext 2014, IES São Paulo.
Valuing Diversity and Environmental Ethics	21 (67.7%)	16 (47%)	24 (47%)	Increase the number of farmers to use biodiversity and appropriate technologies for ecologically based production systems. Proext 2011, IES Minas Gerais.

NOTE[1]: The total of proposals analyzed varies by Proext call for proposals, being 31 for Proext 2011, 34 for Proext 2013 and 51 for Proext 2014. The percentages refer to the specific totals of each call for proposals.

NOTE[2]: Proposals could refer to more than one approach or even not refer to them. Therefore, the quantitative is different from the total of proposals analyzed, the percentage being different from 100%.

In the 116 outreach projects and programs in Food and Nutrition Security analyzed (Table 1), we identify the relevance of perspectives regarding principles that value dialogue with local knowledge, predominantly interdisciplinary, and that takes into account the diversity of natural resources.

The intention of dialogue indicated by the great majority of the programs and projects analyzed, about 90%, is compatible with Freire.[11] For the author, dialogue should not be just a method, but should involve a social relationship that presupposes action and reflection. In seeking the relationship with the people of the community, dialogue reveals the belief in men and women as beings capable of thinking right.[11] Vasconcelos & Cruz,[12] when dealing with popular education, reinforce the importance of solidarity, love, organization and autonomy of subjects and groups, in a social movement of intellectuals, technicians, popular leaders engaged in the transformation of society, in order to overcome poverty and oppression. Boaventura de Souza Santos also rescues the importance of the dialogue between scientific and common-sense knowledge, [13] in which the utopian and liberating dimension of common-sense emerges in the dialogue with scientific knowledge. A similar view is shared by Leff,[14] when proposing a retotalization of knowledge through an interdisciplinary method and the reinvention of identities through the dialogue of knowledge (scientific reason and popular knowledge), which transcends the interdisciplinary project. Eduardo Vasconcelos[15] clarifies points of debate about the terms "interdisciplinarity" and "transdisciplinarity" that indicate, but do not exhaust, the challenges of phenomena and the various possibilities of creative interaction between fields of human knowledge and practice. 'Inter-practices' mean the interaction between the boundaries of fields of knowledge and practice, both formal and informal, as well as in the interaction with the field of art and with common sense and / or popular culture.

Still in this perspective, Naomar[16] understands that transdisciplinarity would be the "possibility of communication not between disciplinary fields, but between agents in each field, not through the circulation of the speeches (through the translation), but through the transit of the subjects of speeches". Therefore, it would be the process, strategy of action, mode of practice. The process of building scientific knowledge must be increasingly social, political-institutional, matrix-based and amplified.

The projects analyzed indicate the search for interaction between disciplines, through interdisciplinarity (more than 80%). This intention of communication is manifested by the dialogue between these fields of knowledge-practice, from the relationship with common sense and / or popular culture, and also with other disciplinary fields as modality of the practice of outreach, revealing the approach of the transdisciplinarity perspective.

These principles approximate the proposals of participatory science, of militant science, and science for environmental justice.[2] In Velho,[4] this perspective is compatible with the conception of science for the good of the society. It should be added that the perspective of interdisciplinarity is also present in the conception of science as a strategic opportunity, revealing the possibility of paradigms coexistence.

In the approach between university and society, and in the interaction between several subjects with the social context and the environment, the proposals reinforce the necessity of non-fragmentation of knowledge, given the perspective of complexity of food and nutrition security. Thus, the practices of the subjects of science in relation to society also incorporate their practices in relation to nature (about 50% of the proposals).

In this sense, in the SAN area, and even in this more totalizing dimension, Leonardo Boff[17] recalls that what counts for the individual also applies to the community. He understands that the care with the ecological niche will only be effective if there is a collective process of education, in which the majority participates, has access to information and makes exchange of knowledge. The popular knowledge contained in the traditions of the ancients, in the legends and in the stories of the first nations and indigenous people, caboclos, black people, mestizos, immigrants of the first ones who lived here, confronted and complemented by scientific critical knowledge.

Furthermore, in the relationship with nature and the environment, Altieri[18] adds that it is necessary to build a socially just agriculture. These would be key questions: to rise what is produced, how it is produced and for whom it is produced. Such issues would emerge themes such as land tenure, labor, adequate technology, public health, research policy, etc. This factor was noted among the projects when trying to articulate knowledge in the search for intersectorality and interdisciplinarity. It thus reveals an attempt to articulate not only disciplines, but also scientific knowledge areas traditionally fragmented in the university, such as health sciences and agrarian sciences.

Thus, the science conception identified in the outreach in SAN indicates that knowledge is not produced only by the scientific community. More importantly, Table 2 below shows that, in building the project or outreach program in SAN, knowledge is constructed by bringing academia and society together in an interactive way with public policies, multiple actors, and also with the productive sector.

Table 2. Relation with society and influences on who produces the knowledge in the proposals of outreach in Food and Nutrition Security in Proext . Brazil, 2011, 2013 and 2014.

Relation with society				
Proext	**2011 (Qtd/%)**	**2013 (Qtd/%)**	**2014 (Qtd/%)**	**Examples**
Articulation with public policy	10 (32.2%)	10 (29.4%)	24 (47%)	Its main objective is to promote the health of the population. It meets the guidelines of the National Policy on Food and Nutrition and the National Policy on Food and Nutrition Security. Proext 2013, IES Santa Catarina.
Multiple actors	11 (35.5%)	14 (41.1%)	18 (35.3%)	Strengthening of economic cooperation networks between the EES [empreendimentos econômicos solidários] (solidary economic enterprises). Proext 2014, IES Mato Grosso.
Articulation with the productive sector	23 (74.2%)	27 (79.4%)	31 (60.7%)	Increased visibility of dairy products derived from family farms and their inclusion in the institutional market through Exhibitions-Fairs and government policies (PAA - Aquisição de Produtos da Agricultura Familiar [Acquisition of Family Agriculture Products] and PNAE -merenda escolar [school lunch]) as well as in the private consumer market. Proext 2014, IES Paraíba.

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NOTE[2]: Proposals could refer to more than one approach or even not refer to them. Therefore, the quantitative is different from the total of proposals analyzed, the percentage being different from 100%.

The systemic approach to SAN requires and favors the relationship with multiple actors to understand reality, solve problems and design intersectoral and coordinated public policies, from production, marketing and consumption.[19] Therefore, the relations established in the outreach, as illustrated in the table above, potentiate the construction of a knowledge that facilitates the dialogue with the social demands.

Schraiber[20] contrasts with the prevailing view of a necessary division between what is technical-scientific and what is ethical-human in technical actions. He values the subjective dimension, the recovery of values, integral care, but also the social responsibility of the professional, as a technical-scientific agent, citizen and subject of society, in his/her singular action. In order to contribute to health promotion, Buss[21] adds that more than access to quality health care services, health determinants must be addressed in all their breadth, which requires healthy public policies, effective intersectoral articulation of public power and the mobilization of the population.

The partnership with the market (around 70%) in the Proext proposals was presented by the inclusion of cooperatives or farmers in the formal, institutional (public policy-related) or popular market. Silva [22] warns the university's risk of being launched into the market to boost economic and competitive growth, and distance itself from the possibility of promoting human emancipation, approaching the paradigm of science as a solution and cause of problems. However, what the projects indicate with this approach is the opportunity to value local production, in an alternative and counter-hegemonic way of approaching the market.

In Table 3, the focus of the outreach in SAN points to a university committed to supporting the overcoming of the problems of the context in which it is inserted, seeking an integral training and transformation of the society in search of its social welfare (about 60% of proposals). This focus is still reinforced, even in a few cases, with the possibility of developing social participatory instruments in 37% of the proposals (Table 4). According to Velho,[4] the focus of science, technology and innovation, when it comes to social welfare, should ensure connectivity between multiple actors, ensuring social participation.

Tables 2, 3 and 4 suggest the recognition, in some projects and programs of outreach, of non-linearity in the production of knowledge, in which there are multiple actors involved, in which people are subjects of the process and participate in the search for viable alternatives to social networks situations where they find themselves. Thus, it approaches a science and technology aimed at the good of the society, in the service of social welfare and humanization.[4,11,13,14]

However, according to table 3, the relation with innovation is identified, although in a reduced way, in this studied context. For Dagnino,[23] to a certain extent, the idea of innovation is contrary to the proposal of social technology, in which its construction occurs in a participatory way from conception. Intellectual property usually refers to a commercial motivation, in which "technology is not chosen to be the best, but it becomes better because it is chosen".[24] Therefore, here we also identify the approach of a science and technology as a source of strategic opportunity, focused on innovation policy.

Table 3. Focus on the proposals of outreach in Food and Nutrition Security presented to Proext. Brazil, 2011, 2013 and 2014.

Proext	2011 (Qtd/%)	2013 (Qtd/%)	2014 (Qtd/%)	Examples
Focus				
Social Commitment / Social Transformation (in search of social welfare)	18 (53%)	21 (61.8%)	34 (66.6%)	Building critical awareness among students, problematizing the training received in the universities and the structure of society, putting them in contact with the Brazilian agrarian reality and with the prospects of transforming it through the organization and social mobilization. Proext 2014, IES Brasília.
Innovation	0 (0%)	0 (0%)	2 (3.9%)	It will act by offering training in PI [propriedade intelectual] (IP - intellectual property) to team members, especially in the dissemination of Science, Technology and Innovation for Social Inclusion, aiming at strengthening the technological outreach of this proposal. Proext 2014, IES Bahia.

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Cardoso[25] considers that technological education should contemplate the valorization of the human being in the process, preparing him/her to reason on productive models through critical elements, to understand the reality of production. The ethical issues and the social cost that the technological process - and not just economic - entails need to be considered. According to Feenberg,[26] to have some control over our own humanity, it is necessary to plan and conduct technical development through various public processes and private choices.

Table 4. Strategies / Tools to reach objectives in the outreach in Food and Nutrition Security presented to Proext. Brazil, 2011, 2013 and 2014.

Proext	2011 (Qtd/%)	2013 (Qtd/%)	2014 (Qtd/%)	Examples
Strategies / Tools				
Participation in the construction of knowledge	12 (38.7%)	8 (23%)	17 (33.3%)	It will be developed through participatory methodology, where the members will act in all the stages of the project, stimulating the mobilization, the valorization of the knowledge and the creativity of the participants. Proext 2014, IES Mato Grosso do Sul.
Transmission / dissemination / transfer of knowledge	18 (58%)	21 (61.8%)	28 (54.9%)	It is also necessary to record the activities developed so that this can be used in the different activities of dissemination, technology transfer and training. Proext 2011, IES Paraná.

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It is noticed that different views in the outreach in SAN coexist, implying in different paradigms. The perspective of knowledge transmission (Table 4) refers to conceptions of more linear science (beginning with science until producing social welfare). In this case, the paradigm would be more related to the conception of science as the motor of progress. The following examples demonstrate a reduction of the problematization and the dialogue ideas to a simple exchange of information, complemented with actions more focused on the diffusion or transference of technology and knowledge. This perspective can perhaps be understood as a first step towards achieving progress

in building new knowledge with the community. Below, examples in the proposals reveal the search for approaches that involve greater commitment and participation of the community, but with the presence of elements that indicate the contradiction of these theories with the diffusion practices or transfer of unidirectional information:

> Approach of the themes will be based on the pedagogy of problematization, that is to say, starting from the exchange of information with the participants about the reality of the living conditions of their communities (...) transfer of technical-scientific knowledge to the population (...) strategies for diffusing the culture of innovation. Proext 2014, IES [Instituição de Ensino Superior] (Institution of Higher Education) Bahia.

> Partnership with farmers will enable / facilitate the transfer of technologies and knowledge (...) transfer of technologies for production (...) aiming at improving competitiveness and living conditions (...) diffusion of technologies adapted to local reality (...) disseminate technologies derived from research results. Proext 2014, IES Mato Grosso.

Other proposals have already presented elements that indicate a dialogue with local reality and potential, such as:

> use of tempered salt, made with herbs / spices produced in the garden of the schools to season foods, and to increase the School Meal Program with meat product added with bean flour (Phaseolusvulgaris L.), being beans **acquired from local farmers** (emphasis added). Proext 2014, IES Rio Grande do Sul.

In university outreach, these creative solutions are stimulated and potentialized through dialogue and participation in the relation with the other, leading to the possibility of a creative praxis.[27] This praxis in Proext occurs through intersectoral articulation with several actors, through the dialogue of knowledge and valorization of traditional knowledge, in the search for viable alternatives, and by political action through public policies. Thus, in considering the whole, it approaches an integral approach to education, science and technology that is for the good of society.

Of the 116 proposals analyzed in the Proext 2011, 2013 and 2014, 53% related to the development, transfer or social construction of technology. According to Grinspun,[28] in terms of education to live the technological age, it is necessary to think how the individual stands before his identity, but also before the situations that surround him. This one can create, use, transform technologies, but without being absent, unaware of the dangers, challenges and discomforts that technology itself can entail. As Saviani says, [29] "the educational act always carries with it certain political content", and the professor's practice, whether conscious or not, has a political meaning in it. There are identified proposals that have attempted, as below, to relate the principles of social technology to that of innovation, revealing an approach to the conception of science as a source of strategic opportunity.[4]

> Develop a social technology that will produce innovation to overcome food and nutrition insecurity in the school community. Proext 2014, IES Amazonas.

At present, according to Moretti,[30] the insertion of the individual into the knowledge society without a view to social transformation alienates the subject by aligning it with capitalist society. Knowledge ceases to be the mediation of man to human training, occupying the role of commodity.

On the other hand, we identify in Proext projects and programs the search for technologies that facilitate autonomy and empowerment. For example, in the following reports:

> Social Technology Incubator for Food and Nutrition Security (...) as a space for advice and support (...) can generate applications of social technologies associated with specific social groups organized through economic enterprises in solidarity [EES]. Proext, 2013, IES Brasília.

> All technologies proposed for actions will be built in the field, based on a group of activities, involving professionals and students from different areas, as well as family farmers in general (...) taking together a pedagogical action in the field (...) serving (...) [the] interaction between teaching, research and outreach. (...) The technologies (...) will be planned, constructed, installed from the protagonism of the local actors. Proext 2014, IES Pernambuco.

In the science-technology-society triad, education has a place of prominence for what it produces, develops, but above all, for what it can build. Technological education must consider that the training of the individual gives him the conditions to promote the creation of technologies. The commitment must be greater with the process and not only with the product or final result of the technology. It must relate the technology to the daily work of the individual, it must awaken a humanistic side of technology, valuing the subjective world.[28]

In Proext projects and programs, a SAN approach involving sustainability (agroecology), solidarity (cooperativism, EES), local autonomy of small farmers ("family independence", "protagonism"), healthy consumption (agroecology, healthy eating) and encouraging regional food. In addition, they seek to provide technical assistance for the quality of food, systematization of the production chain and aggregation of value, organized in a collective network of farmers.

Therefore, the option for social technologies, or more specifically, those that propose alternatives to conventional technologies, is perceived. The proposal of social or alternative technology is a way of resistance to the conventional technology, being in its foundation the solidarity and the participation of the farmers/ people/ communities. Theories and technologies would provide solutions to various problems, and would be social actors, the subjects responsible for the final decision on a series of technically possible options, and the very definition of the problem would

change throughout the process for its solution.[23] It relates to the metaphor of *seamless fabric,* in which the set of technical and social elements results in something more than the sum of these elements. Thus, technology could leverage an alternative style of development, since technological development is not linear but can branch out in many directions and alternative projects, redesigning scientific and technological interests to the demands and interests of social actors.

Still, in the pedagogical area, universities use information technologies for education in SAN. The following example demonstrates the use of this language:

> Social technology network (...) with the theme of School Meal Program. This process generates a strengthened group of actors that can modify the social reality through the exchange of experiences and knowledge, as well as generate paths and processes for the monitoring of the human right to food, besides making possible the construction of a collective and participative model (...). Another partner (...) is telenutrition (...) which uses the internet as a tool (...) the blog (...). It is a virtual space in which we hope to be able to maintain discussion forums on controversial issues, exchange of successful experiences. Proext 2013, IES Rio de Janeiro.

In the above text, the use of the Internet can contribute to the construction of knowledge for the articulation of collective and critical debates that make possible the expansion of the consciousness of those involved. Multimedia implies the notion of fluid movement from one dimension (time) to another (space), in which one searches for diversified forms of language for collective construction of knowledge and dialogue between individual and collective knowledge. However, it is necessary to problematize it, since it is fundamental that a process of constructing a conscious identity of its time and of its reality takes place so as not to run the risk of having a legion of netizens with full appropriation of the cyberculture tools, but totally alienated and without critical awareness. On the other hand, information technologies can recognize learning as a praxis of doing, for integrated training as a source of collective experience and meaningful learning. In this way, it would collaborate for the subjective construction of the subjects, besides allowing changes by the sharing of experiences. The university can also develop as a space for action and reflection on reality, and consider local and global aspects. The integration of the cyberspace languages, of popular and scientific culture can extend the subjects' abilities and competences to reveal the context through new social practices inside and outside the university. In this way, it would enable the political and cultural awakening in the subject so that it can broaden the process of awareness about itself and the world. Therefore, they can create, think and articulate themselves through political and social emancipation in the exercise of their citizenship.[31] Thus, the relationship with knowledge implies a creative praxis.

Some proposals refer to more dialogic approaches. However, others are based on diffusionist approaches, of technology or knowledge transfer, to the detriment or in opposition to actions more committed not only to popular language and its participation or mere naive dialogue, but with the possibility of a transformative reflection on the problem situation. They reveal, therefore, the coexistence of differentiated paradigms in the SAN outreach proposals, sometimes with contradictions between theories and practices within the projects and programs themselves.

A paradigm becomes dominant through a struggle for hegemony in the disciplinary field occupied by historical, conductive, and scientifically driven subjects. [16] Therefore, SAN understood as a complex object comprises cultural products resulting from a social practice. Before the analysis, we agree with Faria,[32] who believes that university outreach is stuck in two contradictory paths. In one direction, it seeks to overcome itself as an articulating instrument that produces transformations both intramural and extramural; In another direction, it may serve the maintenance interests of hegemonic classes. Thus, it must be in constant reflection on its practice, on the model of university and society that it aims.

Conclusion

In considering the proposals submitted to the Proext, the construction of knowledge and technology in the area of Food and Nutrition Security shows itself as a complex object articulated to social practice. The outreach in SAN encourages an integral approach to education, with the approximation of Science, Technology for the good of the Society, which seeks, through the knowledge dialogue, to enhance local knowledge, encourage collective mobilization, participation, involvement with public policies and the construction of technological alternatives to the dominant agro-food system. In spite of this, it is perceived that different paradigms related to science and technology coexist between the projects and programs of outreach in SAN. Some discourses present knowledge production models by the logic of the market, or reveal contradiction between dialogical theories and practices more directed to the transmission of knowledge or technologies. These approaches may generate resistance regarding the incorporation of new knowledge and technologies due to the reduction of the autonomy and freedom of the subjects of the communities in the processes.

The study on outreach in SAN reinforces the importance of linking the academy to the local reality and the construction of knowledge in SAN adapted to social needs and committed to the solution of local problems. However, it is up to the university to continue and deepen the reflection on the principles that guide its practices, the relation of proximity with the society in the construction of knowledge, in order to clarify to what and to whom its practices serve.

Contributors

EMP contributed in the conception, methodology, collection, analysis, interpretation and final writing. ER, in the design of the methodology, critical review and final writing of the article.

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