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ENVIRONMENTAL EDUCATION AND INTERDISCIPLINARITY WITH DISTANCE EDUCATION METHODOLOGY IN THE TECHNICAL COURSE IN LEGAL SERVICES OF THE FEDERAL INSTITUTE OF EDUCATION, SCIENCE AND TECHNOLOGY OF PIAUÍ – BRAZIL

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ABSTRACT

The objective of this research was to analyze interdisciplinary teaching / learning strategies from the socio environmental perspective in the technical course in Legal Services of the Federal Institute of the State of Piauí, Brazil. This is a qualitative investigation. As data collection instruments were used a questionnaire applied to 182 students and an interview with eight teacher tutors from the Legal Services technician training course. It is concluded that interdisciplinary practices require actions that promote greater qualification of the actors involved in the process. The results indicate that these environmental practices should directly impact the curricular matrix. The students understand that the Environmental Education should be developed in the collaboration of the construction of a global awareness of the issues related to the environment and this perception is in accordance with what establishes the national curricular parameters for the training of these professionals. The students affirmed the possibility of insertion of the environmental education in the curricular scope through the obligatory curricular stages or not. The majority of teachers interviewed, agree that it is essential to develop teaching / learning strategies from interdisciplinary projects as an integrative methodology between the practice and theories developed in a virtual or face-to-face classroom.

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INTRODUCTION

Every day society has perceived the need to make changes in attitudes and actions becoming fundamental behaviors that promote social and environmental development consistent with the needs of the global reality. The studies about environmental education (EA) are more present in people's daily life, since it is clear how important the issue of environmental awareness in all its aspects and environments is, and can provide, from this environmental education, an ecologically balanced environment, since the environment is a common good of the people and essential to the healthy quality of life. But in order to provide a more environmentally

balanced life, it is necessary to seek the promotion of environmental education at all levels of education and public awareness for the preservation of the environment, as foreseen in the legal instruments. It is necessary to develop practices and actions related to environmental education for the whole community and that has not yet been an easy educational issue at the various levels of education. The search for the construction of social values, knowledge, skills, attitudes and competences aimed at the conservation of the environment, is faced with the lack of preparation of part of the society for the realization of this environmental awareness. Thus, it is necessary to develop studies and research in order to investigate, evaluate and stimulate actions focused on

environmental issues, and when focusing on sustainability in public administration, it has a direct impact on the reality of the public service that is the showcase for the effectiveness of these policies to encourage the environment in general. The purpose of this research was to analyze how the implementation of interdisciplinary teaching / learning strategies in the social and environmental perspective is being approached in the middle level technical course in Legal Services with the methodology of Distance Education in the Federal Institute of Education, Science and Technology of Piauí, Brazil.

Theoretical Foundation: Building a more responsible society with environmental issues finds fundamental support in educational institutions as trainers of citizens with socio-environmental responsibility. This perception of more proactive actions towards the environment contributes to promote a less predatory consumption of environmental resources, since this uncontrolled consumption is reflected in an unsustainable Ecological Footprint (PE), which can be defined as "how much Nature is used to support a neighborhood, a city, a country, or to maintain a particular lifestyle of a person and / or social group" (SOLER, p. 47, 2012). The formation of students committed to environmental causes requires an academic commitment from higher education institutions (HEI) through interdisciplinary pedagogical projects that contemplate activities in the classroom with actions and projects of interventions in the academic community and beyond and that contribute to the construction and consolidation of knowledge. In this regard, Gonçalves (2018) affirms that "for environmental education within the Institutions of Higher Education, a deep transformation of the university community is necessary for greater solidarity and cooperation between cultures and individuals." (Gonçalves, pp. 43, 2018). For Silva & Carvalho (2010, p.16), "As school is the place of transformation in the larger social context, it is also at school, especially at HEI, that the human being develops his / her critical worldview, revealing his / her political, human and social conceptions. "The fulfillment of social responsibility is related to the quality of education, the training of education professionals, human promotion and services rendered. The emergence of environmental, economic and social problems that compromise the future of the next generations makes it essential to develop a social and environmental responsibility in HEIs. But despite growing debates on the issue at the international level, Tauchen and Brandli (2016) say that there are still few socio-environmental actions carried out in HEIs. According to Morin (2006):

... The supremacy of knowledge fragmented according to disciplines often prevents the link between the parts and wholeness, and must be replaced by a mode of knowledge capable of apprehending the objects in their context, their complexity, their set. (Morin, 2006, p.14).

Education for Sustainable Development (ESD) reflects the concern for quality education, which is partly defined from learning outcomes, and enables learners to be and to do, including the importance of practical skills (PETROVICH, p. 24, 2018). With regards to the social dimension, Bendlin and Garcia (2011), affirm that this is an indispensable aspect that must be considered with regard to sustainable development. This dimension must also be faced as a form of environmental protection. Environmental education deals with the

relationship between society and the environment, focuses on the subjects through the educational process and contributes to the formation of sustainable societies (VIEIRA, p.17, 2016). The approach of environmental education in this work requires an explanation of the aspects of legal education, since the Brazilian legislation in force is very broad in relation to the environment, starting from the Brazilian Federal Constitution to decrees and resolutions. This constitutional requirement on the State to respect, protect and promote the conditions that enable dignified life and protect the human person is in harmony with the understanding that everyone is entitled to the ecologically balanced environment. According to the Brazilian Constitutional norm, the promotion of environmental education at all levels and modalities of teaching is highlighted. The Federal Constitution of 1988, in section VI of §1 of art. 225 establishes, unequivocally, the right to Environmental Education that emanates from the duty of the Public Power to promote environmental education at all levels of education and public awareness for the preservation of the environment. Environmental Education reveals its face of fundamental right, constitutionally assured.

The National Policy on Environmental Education through Law 9.795 / 99 establishes that environmental education requires organization at different levels and modalities in the teaching, research and extension process, dialoguing in a systematic and unsystematic way with the educator's purpose and educating to commit to the conservation of the environment. Practices in Environmental Education require, in a very careful way, a conceptual basis. The definitions about Environmental Education are many, however, it is relevant to emphasize that Environmental Education is characterized by presenting an integrative and interrelated approach to environmental and human issues.

In this sense, says Pooli *et al.* (2013, p.18),

"Interdisciplinarity can be characterized as an attempt to establish associated working relationships between a set of disciplines, seeking an approximation between concepts, to analyze specific and concrete problems. Objective conditions are sometimes created to create new concepts based on interdisciplinary dialogues". From this perspective, it can be seen that environmental education, because it has an interdisciplinary characteristic is not easily understood by the actors responsible for the educational process, who, in the majority of cases, place environmental education only as actions related to specific practices such as garbage collection and other specific actions. According to Pooli *et al.* (2013, p.27), "interdisciplinarity can be an alternative for school education to contribute to the new generations having schooling processes more connected to the world of life." The reorganization of differentiated knowledge of materials and the restructuring of the subjects of studies of the traditional disciplines suggest a method of production and modification of the knowledge for the formulation of environmental contents of the most different careers, post-graduations and curricular components.

According to Leff (2008, p. 213), it is understood that:

"The objectives of environmental education are not achieved through the teaching of systemic methods, an interdisciplinary pedagogical practice or the incorporation of an integrative character - ecology -

within existing programs. Environmental education requires the creation of an environmental knowledge and its transformative assimilation to the disciplines that should generate the concrete contents of new environmental themes”.

According to Leff (2008: 211) "environmental knowledge is more than a knowledge composed of the amalgam of current knowledge or the conjunction of the various disciplines to solve a concrete problem." In addition, it is perceived that environmental education for its real effectiveness must have interdisciplinary actions and practices aimed at a true construction of knowledge so that it is not with specific and systemic aspects, and should always seek to have the national curricular parameters as a basis, having the flexibility to adapt to each reality of action in the search for the development of actions aimed at the environmental practice in the educational scope. Table 1 presents Environmental Education as an educational strategy based on pedagogical tendencies of critical theory (Pedrini, 2008, p.21).

MATERIALS AND METHODS

Regarding the approach, this research is characterized by being qualitative. The exploratory case study was adopted as a method. Thus, we specifically studied the adoption of interdisciplinary pedagogical practices through a pedagogical project entitled "Integrative Project: Environmental Education in Public Administration", and consisted of an interdisciplinary academic activity with the objective of developing the necessary skills and competences for the integration of contents developed in modules I and II of the technical course on Legal Services in the distance education modality of the Federal Institute of Education, Science and Technology of the State of Piauí, Brazil. Academic activities were developed in an interdisciplinary way and focused on environmental education. This project was prepared by teachers-tutors together with the students and presented to the coordination of the course and was promptly approved and implemented. The project was developed through the realization of field research and the application of interviews and questionnaires, where the students made photographic records of the performance of the students in public agencies (Federal Institute of Piauí, Federal University of Piauí, City Hall of Teresina; Court of Justice of the State of Piauí, City Hall of Parnaíba, City Hall of Floriano); and later, of the results and reports of the project, with critical analysis about the reality of each public organism. The project was developed with students in the poles of distance education of Teresina Zone Sul, Teresina Dirceu, Parnaíba and Floriano of the Federal Institute of Education, Science and Technology of Piauí.

The case study in the Yin (2015) conception is an empirical investigation that seeks the investigation of a phenomenon in the context of our daily or real life, in which the boundaries between phenomena and context are not clearly defined. The instruments used to collect the primary data were interview and questionnaire, whose results were analyzed through Content Analysis. In this respect Bardin (2011, p.147) reports that "categorization is an operation of classifying constitutive elements of a set by differentiation and then by groupings according to gender (analogy), with previously defined criteria."

Still according to Bardin (2011),

"Content analysis appears as a set of communication analysis techniques, which uses systematic procedures and objectives to describe message content. [...] The intention of the content analysis is the inference of knowledge regarding the conditions of production (or, possibly, reception), which inference uses indicators (quantitative or not). (BARDIN, 2011, p.44)

The results were obtained from the answers of the questionnaires sent to 500 students of the mentioned course, of which 180 answered; and interviews with 8 teachers about the effectiveness of the interdisciplinarity provided by an extension project entitled "Environmental Education in the Public Administration", developed in the technical course in Legal Services.

RESULTS AND DISCUSSION

When analyzing the subjective answers of the questionnaire, one can categorize them in three slopes. The first category of responses relates to environmental awareness; the second category of responses relates to participation in events in the environmental area and, finally, the third category has a focus on the Practice of curricular internship. The first category that relates to environmental awareness, makes it clear that students agree to the insertion of environmental education in the curriculum of the course through a short-term project within the existing disciplines themselves, seeking interdisciplinarity or through academic projects, in addition to separation of subjects in theoretical and practical classes for better didactic purposes. Thus, the answers presented by the students related to the first category are supported by the National Curriculum Parameters, which reports that the work of Environmental Education should be developed in order to collaborate with the students to build a global awareness of the issues related to the environment so as to assume positions that are in tune with values related to their protection and improvement. For 78.1% of respondent students, they agree that the teaching-learning process adopted in the course of legal services requires an interdisciplinary methodology to promote interaction between disciplines and environmental approaches and 21.9% stated that it is not necessary. This percentage, which states that an interdisciplinary approach to the course on environmental issues is not necessary, is very considerable for a group of students who, in theory, must have a very critical view of the environment.

In addition to this, 72.2% of the respondent students state that the knowledge of the Pedagogical Project of the technical course in Legal Services is fundamental. In making this statement and obtaining these answers, it can be stated that the students have a real perception of the importance of having knowledge of the Pedagogical Project of the Course, since this project must be in line with the requirements of the national curricular parameters related to environmental education. Thus, this reality alludes to the conception of Breuckmann et. al. (2015), since the knowledge of instruments and regulations are fundamental for the good performance of professionals. Regarding the second category of responses that deals with participation in events in the environmental area as a way of inserting environmental education in the curriculum of the course, the students affirmed that it is relevant to participate in or hold congresses, meetings and symposia in order to clarify and present environmental measures for students to better absorb and insert environmental education within the course.

Table 1. Pedagogical Contributions for Corporate Environmental Education

Author	Concept
Maturana (1998)	Idealizes an education that promotes acting in the conservation of nature, understanding to the point of excluding the idea of dominion, living with responsibility for the individual and the collective and distancing from any kind of damage
Guimarães (2000)	Environmental Education treats Teacher and student as transforming agents of society, which open to the socio-environmental problems of the community.
Leff (2001)	Environmental Education brings a new pedagogy that precisely guides education; which implies concrete practices that develop in the environment; which induces transformations of knowledge from a new perception of the relations between ecological, economic and social processes; which involves taking the environment into its physical, biological, cultural and social context as a source of learning; which leads to the internalization of environmental principles and values in the contents, approaches and practices of educational processes.
Grisnpun (2005)	It is necessary to extend the meaning of the natural environment to the meaning of social environment, increasing care with the environment and the social environment, contemplating values of citizen life that include health, sexuality, family, work, science and technology, culture, languages
Pedri e Brito (2006)	Environmental Education should focus on the awareness and transmission of knowledge as well as the promotion of values and habits, the development of skills, guidance for decision-making and the search for solutions to environmental problems.

It can be seen that the students feel the lack of environmental events in the environmental area and even stimulate their participation in events related to the environment in order to awaken a greater critical sense regarding the area. The coordination of the course should seek to insert more environmental or multidisciplinary events and stimulate student participation in environmental events. Thus, it is necessary to emphasize the importance for the students to understand the complexity and the amplitude of the environmental issues, being fundamental to offer to them a great diversity of experiences, trying to encompass diverse realities and, at the same time, a contextualized vision of the environmental reality in the most diverse environments, mainly in the scope of professional action. The third category is related to environmental practice in the scope of curricular stages. The students affirmed the possibility of insertion of the education in the curricular scope through the curricular stages, being the stages the ideal place to apply theoretical aspects in the scope of the practice with development of activities related to processes / documents, ways to save paper and how to reuse it. Thus, 83.6% of the of the respondent students recognize the need for the technical professional in the Legal Services area to work in public / private institutions through socio-environmental actions.

In view of the above, it is fully possible to manage the course according to the answers obtained, to orientate both the students and the trainee partners in order to direct the development of actions focused on environmental issues in the private and public organizations, which would meet the national curricular guidelines of environmental education as a way to bridge the gap between environmental theory and practice. When interpreting the responses of the teachers tutors about their perceptions regarding the importance of the development and accomplishment of interdisciplinary projects as a teaching / learning strategy carried out in the Technical Course in Legal Services, it was noticed that the majority of the respondent affirmed that the development and application of teaching / learning strategies from interdisciplinary projects as a way to give practical application to the theory developed in virtual or face-to-face classroom. It is also evidenced in the answers that the teachers-tutors observe these strategies as facilitators for better absorption of the knowledge. They also reported that these projects are significant to promote more interactions among these distance education students. Here are some reports of teacher-tutors:

[...] the teaching / learning process requires methodologies appropriate to the objectives set, the

public and the contents for the development of the skills appropriate to the full education of the student (Teacher-Tutor 01).

[...] the importance of such projects is linked to the fact that it breaks the routine of the course a little. It is a possibility for the student to leave some of the "classroom" and observe how the subjects studied by them are applied in practice [...] (Teacher-Tutor 02).

[...] the importance is enormous, and learning becomes more effective because of the interdisciplinarity involved in the course of Legal Services [...] (Teacher-tutor 03).

[...] the interdisciplinary project came to add to the knowledge of the students, as he observed a greater ease of absorbing everything that was given in the classroom and on the virtual platform [...] (Teacher-tutor 04).

When analyzing the reports of the teacher-tutors, it is noticed that the student's involvement with the practical action in the development of the integrative project contributed positively to the formation. In the discourse of teacher-tutors, a great mention is also made of interdisciplinarity and practical issues. In this sense, Pooli *et al.* (2013, p.18) shares the view that interdisciplinarity is characterized by the attempt to establish work relations allied to a set of disciplines, analyzing specific and concrete problems. Thus, the integrator project was a facilitator for better absorption of content presented in the classroom of the virtual teaching-learning environment used, the moodle platform (Modular Object-Oriented Dynamic Learning Environment). Regarding the perception of teachers tutors in relation to the articulation of knowledge between curricular units of the subjects or knowledge acquired by the students of the Technical Course in Legal Services with the environmental theme of the interdisciplinary project developed, the interviewees affirmed that great advances occurred with the practical applicability of disciplines such as administrative law, constitutional law and the discipline of document and archival management. They also affirmed that there was a great deal of involvement in relation to the environmental theme, with a practical articulation of knowledge. They also reported that the integrating project provided evidence of the effectiveness of environmental policy that does not occur efficiently. These perceptions of teacher tutors can be observed in the following accounts:

[...] they were able to assimilate matters of administrative law, because the issue of the Federal Constitution, as well as the issue of environmental law, was integrated in public bodies, of the environmental policy made throughout this project process. They could see how this whole environmental policy issue works, what are the weaknesses, what are the strengths, because in theory everything is very beautiful [...] (Teacher-tutor 01).

[...] had a clear articulation of knowledge, because the interdisciplinary project, in its essence, already has this interaction of several disciplines to contribute to the development of it. So I found it very interesting because the administrative law part was very strong, constitutional law, and also integrated procedural issue [...] (Teacher-tutor 04).

It was identified from the analyzes of the reports that the approach in field research and data collection instruments allowed a contribution of the research to the content addressed in a virtual classroom and was essential for the construction of interdisciplinary knowledge, from the interaction of students with themes such as sustainable bids and their modalities, such as the sustainable electronic auctions that allow greater competitiveness and greater flexibility because it is an electronic modality. In agreement with the results presented, Marocco (2011, p.92) understands that legal science should not be understood as an independent science, away from the other branches of human knowledge, but Law must be observed as a science of a social, intimately linked to the knowledge of the various natures, which give it universality and effectiveness. Some specific actions in relation to environmental management have not been developed by some of the public bodies that are the object of the research, such as the Federal Institute of Education, Science and Technology (IFPI), which even develops, for example, rainwater harvesting. Regarding the perception of teacher-tutors regarding the contribution of the pedagogical practice proposed by the Interdisciplinary Project for the teaching activity in the Technical Course in Legal Services, the interviewees stated that the project's contribution helped to awaken students' participation in the classroom, providing a greater dynamics and allowing the students to feel more confident to ask questions and bring their impressions about that reality. Here are some answers:

[...] the pedagogical practice proposed by the project awakened in me the need to diversify the methodology in the classroom, to include more the student as a researcher, to insert seminars in the meetings, as well as to seek the in locus practice for the student [...] (Teacher-tutor 01).

[...] as teacher-tutor and participating in this project, the question of pedagogical practice was very important because, in fact, our role is to orient, carry out the work, supervise, give a direction to the students, but also letting them produce, we are guiding [...] (Teacher-tutor 05)

[...] the third question, as a teacher-tutor and participating in this project, the question of pedagogical practice was very important because, in fact, our role is to orient, carry out the work, supervise, give a direction for the students, but also letting them produce, right, we'll be guiding. And so, the group responded in a very positive way to the project, they really got involved in

the project, and this involvement for us, for us teachers makes us more motivated. I also noticed that of the projects, one of the projects was carried out in the municipality, here in the City Hall, and even the students were invited to take the project to the schools. To present in schools, to give a new direction, as if it were a lecture even on environmental practices in that area there. So, a lot of things came up, and for me it was also enriching. I knew, I knew a lot, I added totally to the question of knowledge itself, it was an exchange of experiences. And I was sincerely glad to have been a part of it, to have motivated the students, to have that response, and at the same time motivate me to stay, invest in the project, let it roll all that involvement. So it was very interesting, the students contributed in a very positive way, the results were wonderful and for me it was an incredible experience, an exchange of knowledge that was very worthwhile. (Teacher-tutor 03).

When analyzing the answers it is noticed that the tutors teachers lack the capacity to carry out interdisciplinary activities and focused on the environmental education in the scope of the courses in the mode of distance learning mainly. It is evident in the speeches when they affirm that this integrating project aroused in them the need to diversify the methodology in the classroom, with the realization of dynamics and diverse forms of student involvement. Thus, it can be inferred that these tutor-teachers, because they are professionals in the area of the direct, do not have a pedagogical training geared towards the accomplishment of interdisciplinary actions, much less focused on actions related to environmental education; it is necessary to carry out an orientation through training of the general coordination of distance learning or course coordinators in this sense, so that actions that are fundamental to relate theory and practice are consolidated. As a training action, the Federal Institute of Education, Science and Technology can work with continuous training both for the course teachers and for the graduates of the course and thus seek to develop actions to fill gaps in academic training related to the environmental field, for example related to environmental legislation, environmental taxation and environmental education.

Final considerations

The results of the research point to the concern of the coordination of the course in Legal Services Technician of the Federal Institute of Education, Science and Technology of Piauí focused on interdisciplinary pedagogical practices. This concern is evident when both students and tutors of this course, in the distance education modality, positively evaluated the development of an extension project entitled Integrator Project "Environmental Education in Public Administration", in which the students had a very active performance beyond to contribute to the awakening of students' awareness and a real effectiveness of the interdisciplinary environmental practices within the scope of the course, being evident that the students had a critical analysis regarding the practices of social and environmental responsibility in the public institutions under investigation. In addition to the majority of teacher-tutors interviewed, it was essential to develop and apply teaching / learning strategies from interdisciplinary projects as a way to give practical application to the theory developed in a virtual or face-to-face

classroom. The teacher-tutors professed that great advances have occurred with the practical applicability of disciplines such as administrative law, constitutional law and the discipline of document management and archival. These teachers stated that the integrating project awakened in them the need to diversify the methodology in the classroom, with dynamics and various forms of student involvement. Regarding the inclusion of the environmental theme in the course, the tutors professed that the discipline of Environmental Law or Environmental Legislation should be included in the curricular matrix of the course and only one interviewee stated that it should have a discipline of ethics and environmental management. Thus, the teachers' perception is that there is a gap in this theme to be filled in the course. Most of the professors stated that they do not know the environmental theme in the National Curricular Parameters PCN's for the professional technical courses. In addition to what these teachers claimed, they need more training in environmental issues. From the results obtained, it can be concluded that there is a gap in the training of legal technicians in environmental issues, despite the fact that 83.6% of the students recognize the need for the technical professional in the Legal Services area to work in public / private institutions through actions socio-environmental. Thus, it is evident the need for both pedagogical policies, related to the pedagogical projects of the courses, to develop efforts of interdisciplinary practices in order to allow the formation of citizens more committed to broader causes than just their technical education, and related to social and environmental aspects, breaking the Cartesian paradigm observed in the training of certain professionals and notably in the area of legal and ongoing technical with distance methodology.

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