Environmental Education for Staff at the University of São Paulo, Brazil: Capillarity and Critical Environmental Education Put into Action

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Abstract

This article addresses an experience report regarding an ongoing socio-environmental education program for 17,000 administrative staff members on the seven campuses of the University of São Paulo (USP) in Brazil, from the critical and emancipatory perspective of environmental education. The program is being run by the superintendent of environmental management at USP. The objective of the program is to educate all USP staff about the environment; increase the inclusion of sustainability in university management; and encourage sustainable actions in the university. Capillary architecture, in which a group known as "people who learn by participating" (PAP; the acronym in Portuguese is used in its original form in this article because of its resonance) makes a

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commitment to mobilize other groups in their workplace through theoretical and practical courses, was used to ensure that all staff members could be reached. The initial group (PAP-1) is responsible for developing the political-pedagogical project and preparing, encouraging, and mentoring PAP-2 leaders. Subsequently, this group will offer courses in their workplaces to PAP-3 (estimated staff of 4,590), who will involve other university students (PAP-4), totaling 17,000 people at various levels. Some of the preliminary program elements were: (i) ten planning meetings with experts (PAP-1) to improve the project and its strategies; (ii) presentation and approval of the program by the university authorities; (iii) selection of socio-environmental leadership groups on the campuses; (iv) 22 h of education for PAP-2 on environmental education, civilization crisis, climate change, culture industry and consumerism, public policies, and good practices at universities; and (v) dissemination of the initiative through USP media. The results of this unprecedented educational effort are expected to contribute to other institutions of higher education and to make the University of São Paulo a space of coherence and reference in the socio-environmental field.

1   Introduction: Sustainability in the University and Staff Training

One of the major challenges in today's world is to create global socio-environmental sustainability through the contribution of every single institution and territory worldwide. Institutions of higher education in general, and universities in particular, can and should take on important roles in this process. Sorrentino and Nascimento (2010) emphasized the inseparable connection between the utopian ideal of sustainable societies and efforts in environmental education, in which universities play a dual role: the education of university staff per se and contributing to the education of society regarding environmental issues.

Hence, investment in the socio-environmental education of staff is required in order to allow them to take on the role of educators, and also in order to enable their collaboration in the daunting challenge of sensitizing faculty and the university community as a whole so that they also can join efforts in this field. It is necessary to keep in mind that because of the rather focused education received by faculty and the university community, they often find it difficult to understand the complexity of the socio-environmental field and the cross-departmental and multidisciplinary perspectives required in critical environmental education.

The objective of this paper is to present the preliminary results of an ongoing socio-environmental education program for employees at the University of São Paulo (USP), based on the critical and emancipatory perspectives of environmental

education. More specifically, we aim to describe and reflect upon the theoretical and methodological framework of the educational program, its main content, practices, and connections, as well as the expected outcomes.

USP has seven campuses located in the State of São Paulo in the cities of São Carlos, São Paulo, Piracicaba, Pirassununga, Ribeirão Preto, Bauru, and Lorena. According to the "2012 Statistical Abstract of USP," the university comprises a total territory of 76,314,505.94 m^2, with a developed area of 1,821,970 m^2. The faculty has 5,860 members, and there are 58,303 students enrolled in 249 undergraduate courses. USP also offers 239 graduate courses: 332 master's courses with 13,836 students; and 309 doctoral courses with 14,662 students. The university staff of 16,839 people is the target population in this socio-environmental education program (USP 2014).

The program has been run by the superintendent of environmental management (SEM) at USP since 2013, and is based on critical and emancipatory perspectives on both environmental education and action-research (Órgão Gestor da Política Nacional de Educação Ambiental 2006).

To develop this program, in March 2013, the SEM created the Group for Research and Studies on Environmental Education in March 2013. The group comprises of experts from several campuses, and aims to conceptualize and structure the education plan, which is continuously reviewed and improved for collective development.

Considering the participative, permanent, connected, and continuing perspectives of the program, it has several main objectives: to collaborate in the socio-environmental education of the university community; to contribute to the internalization of sustainability into university management; to promote a change in the organizational culture based on agreed-upon socio-environmental values; and to offer support for USP staff in broadening their view/perception/analyses and possibilities of socio-environmental action in their own work and in other areas within this community.

2 Theoretical and Methodological Premises: Capillary Environmental Education

The premises of the program are based on the concept of critical and emancipatory environmental education in the methodological processes of capillary architecture and participant-action-research (Viezzer 2005).

The critical and emancipatory perspective of environmental education is essentially characterized by: a complex understanding of environmental issues; a critical attitude in view of the challenges of the civilization crisis; an understanding that children are not the main target for environmental education; a belief that democracy, dialogue, and participation are essential for building sustainability; and a search for changing realities that are contrary to collective well-being both locally and globally, based on individual and collective changes, as well as structural changes in public policies. This approach stimulates the engagement of individuals and communities in processes that aim to change the current model of society, seeking to build

other interactions among individuals, culture, work, and nature (Carvalho 2001; Lima 2005; Sawaia 2001; Loureiro 2005; Sorrentino 2003, 2005, 2010; Layrargues 2006).

Alves et al. (2010) addressed five aspects pertinent to this proposed program, presenting important interconnected parameters for thinking, feeling, and acting in environmental education: community, identity, dialogue, power of acting, and happiness. The parameter of community involves recovering community meaning by creating collective environmental educators in the dialogic perspective, and developing the power of communication by strengthening individual and collective identities. To consolidate an identity, whether individual or collective, it is necessary to provide elements to search for a global identity that can serve as the basis for dealing with socio-environmental issues on both the global and micro-local scale. The third aspect—dialogue—is understood in this paper as the flow of meaning (different from debate, consensus, and discussion), which allows for building something new and sharing something collective, without competitiveness and eagerness to win. It should be noted that, according to Alves et al. (2010), there is a distinction between the I-Thou relationship, which is the encounter between the essence of beings, and the I-It relationship, which is fundamentally utilitarian. The power of action, the fourth aspect under consideration, is discussed mainly using the Espinosa framework (Baruch Spinoza, 1632–1677); its essence is participation, immanent/constituent and inseparable from the human condition. Each person must awaken the capacity to identify "the environmental issues, become involved, and commit towards making whatever decisions are necessary" (Alves et al. 2010, p. 10). The authors also highlighted the happiness issue—the idea of a utopia for all —as a fundamental aspect to be considered in the environmental education process, which is intended to be emancipating. In view of the various definitions and studies of happiness, it is important to consider that the human condition in the present degrading and unequal society has a deep impact on people's feelings and their search for happiness. Aspects related to happiness (psychological well-being, health, education, standard of living, etc.) must be considered, including when creating indicators and planning goals.

The challenge of the USP socio-environmental education process is to promote "good encounters" that allow "subjects to share and dialogue about their experiences, and thus strengthen the power of action" (Alves et al. 2010, p. 28).

Following this line of thought, Sorrentino and Nascimento (2010) postulated a number of important questions on environmental issues and sustainability within the university scope:

> What role (or roles) does the University play in the field of sustainability and environmental education? And, on the other hand, what is the role of sustainability and environmental education at universities? What roles should the public policies play for these institutions to work more determinedly in the field of sustainability and environmental education? (Sorrentino and Nascimento 2010, p. 17).

According to these authors, first, the participants and society who maintain the university must define the direction to be followed in the complex context of contemporaneity. Second, but equally important, they should determine how it

should be done. To talk about building sustainable societies through education implies the need to delve simultaneously into knowledge and action proposals that involve the formulation and implementation of public policies, and the improvement of teaching and learning methods and techniques that allow such studies, debates, and learning (Sorrentino and Nascimento 2010).

Considering the target audience of approximately 17,000 public workers (administrative staff) from the USP campuses who are from various sectors and work areas, this educational program uses capillary architecture in a horizontal network of multipliers. This system of capillary education refers to two connected and complementary meanings: "participant-action-research" and "people who learn by participating", or simply PAPs, comprising a learning, interpretative, and affective community of life and meaning that is in a place for good and humanizing encounters and for praxis (Ferraro and Sorrentino 2005).

The superintendent of environmental management (SEM) and the Group for Research and Studies on Environmental Education were included in the capillary network as a PAP-1 collective educator (25 people), playing the role of developing the political-pedagogical project and creating and monitoring (on-site and at a distance) a group of agents and commission members, the PAP-2s (135 people). The latter are committed to teaching courses at their workplace to PAP-3s (4,590 people), and the PAP-3s are in turn committed to developing educational action connected to environmental management, and involving other public workers (the PAP-4s), implementing the education of a total of 17,000 people with different levels of knowledge regarding the environment (as illustrated in Fig. 1).

The whole process is being recorded by a support team, in both print and audiovisual files. These files are stored and shared through email and on a USP virtual platform, comprising a collection of data made available to all program members.

3   Content and Practices of USP Staff of the Socio-environmental Education Program

The socio-environmental education program for USP staff is structured on three interconnected axes: the availability and problem-posing of contents; praxis pedagogy, creating dialogical and reflexive processes; the production of new knowledge in education action; and the creation of interpretive and learning communities.

For the availability and problem-posing of the contents, the PAP-1 created a "learning menu", with contents that are fundamental for environmental education as well as sustainability practices, which must be developed with the PAP-2s, PAP-3s, and PAP-4s on all campuses.

The learning menu, according to Tonso (2005), should propose activities in a variety of formats that develop the recreational, affective, and aesthetic meanings of educators-learners, beyond technical and objective information. It presents items of different natures, including informative (providing several types of content and knowledge) and formative (allowing creation of methodologies, values, perceptions,
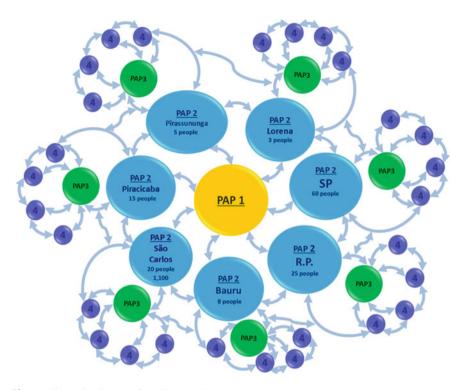
Fig. 1 Illustrative image of capillary architecture

and attitudes of the educator being trained). The learning menu also assumes an identity of its own, according to the specific demands of the local community, in this case, each campus.

Though approached through different modules, the topics in environmental education, communication, and public policies are, in fact, cross-sectional to every module and practice. The contents are addressed at different depths, according to the duration of the educational actions, with PAP-2s and PAP-3s receiving contents in the highest number and greatest depth.

Each group has access to: a *conceptual repertoire*, which comprises a set of information on society and the environment, sustainability, and environmental education; a *situational repertoire*, with resources to make participative socio-environmental diagnoses; and an *operational repertoire, in which each PAP will have to develop a sustainable educational practice in the workplace that could have a positive impact on environmental management at the university* (SGA/USP 2014).

The second methodological axis, praxis pedagogy, brings in the theoretical-practical dialectics of Paulo Freire (1921–1997). It is based on the principle that knowledge is a continuous exchange of experiences accumulated in life. The educator is, at the same time, also a learner open to the teaching-learning process in the search for sustainable solutions and practices. This attitude is particularly

important to building sustainable societies as we move away from collective unawareness of deeper answers to contemporary questions, which culminated in the current unsustainability. Based on this pedagogical approach, the actor-subject becomes the protagonist-agent of his or her own choices and actions, although those choices and actions are agreed upon in the groups in which they participate. In other words, within the groups there is a foreseen collective attitude of collective learning and implementation of shared solutions. This is, therefore, the third methodological axis of the present study: interpretative and learning communities.

Inspired by the Paulo Freire culture circles and interpretative and learning communities (Avanzi and Malagodi 2005; Brandão 2005), this collective educator is a collegiate enterprise that gathers people with support from their institutions to work in an educational program of participant-action-research on the environment, citizenship, and quality of life in a given territory (Ferraro and Sorrentino 2005).

Within the PAP theoretical and methodological axis and similar to its capillarity proposal, the National Environmental Fund financed the project "Making Utopia Viable", developed by the São Paulo Collective Educator, Araraquara, Jaboticabal and Region (CESCAR)/Brazil, in the period between 2007 and 2008. This project implemented an education program for environmental educators, with the participation of 90 people and 39 partner institutions from 12 different municipalities of the State of São Paulo. As part of the proposal, PAP-1 s belonged to the Environment Board's Managing Office of the Ministry of the Environment, PAP-2 s were the educators from CESCAR's partner institutions, and PAP-3 s were the participants in the education program who developed educational interactions with PAP-4 s in their municipalities.

During the periods of reflection carried out during the process, participants reported that this course had been different from others they had previously attended or experienced, due to the innovative attitudes and spaces for dialogue which had been created (Oliveira 2011). Santos (2010) analyzed CESCAR's constitution and observed that, despite the inherent difficulties of the PAP theoretical and methodological axis, such as some lack of participation, attempting to reconcile schedules, waiting for and respecting each person's response time, which implies an excessively lengthy process, the results were satisfactory. According to assessments by the participants, not only did they obtain the theoretical basis they had been looking for, but they were also able to form PAP-4 s and provide continuity in the education process. Participants said that they were able to understand the process and realize that learning done in this manner is more significant. They also stated that they were able to put what they had learned into practice during the interaction projects with PAP-4s, and learn from them as well.

Another example of a participative process which lends itself to comparison and exchange of experiences is the creation of the University Environmental Education Program (PUEA), which has been developed on the Luiz de Queiroz/USP campus, located in the municipality of Piracicaba, São Paulo, Brazil. This project aims at making environmental education intrinsic to research, teaching, outreach programs and university management. The process was created with the involvement of all campus sectors through meetings, seminars, and talking circles, and by sharing

experiences and welcoming initiatives. Within 5 years (from 2009 to 2013), the campus was able to write up a document (Cooper 2009) and have it approved by its highest bodies (congregation and councils). Implementing the process has been a challenge and a great learning experience, for it implies a revision of all the practices and relationships within the university. The process has been gradually implemented on the campus and is part of the Participative Socio-Environmental Master Plan for the Luiz de Queiroz campus (Escola Superior Luiz de Queiroz 2013).

Other practical experiences in this line of work within the University of São Paulo have also strengthened groups, supported joint actions, created spaces for speaking and making decisions, and led to positive outcomes, which can be found in publications and articles concerning events in this area (Meira et al. 2009; Sorrentino et al. 2003; Sudan et al. 2007, 2009).

4 Connections with Educommunication as Part of the Education Process

Allied with the perspective of critical and emancipatory environmental education, educommunication, as an educational practice, stimulates the production of communication materials in a participative and dialogical way, aiming to encompass both groups and communities with the perspective of forming social communication networks and affirming human rights, as well as the values of social justice and sustainability.

According to the USP Center for Communication and Education, educommunication is defined as:

> A group of actions aimed at broadening the communicative coefficient of educational actions, which can be formal, non-formal, and informal, by increasing the expression skills of educational community members, as well as their competence in handling information technology, so as to build open and democratic communicative ecosystems, thus ensuring equal opportunity of expression for the whole community (NCE/USP apud. Brasil 2014).

The principles of educommunication involve, besides dialogical and participative processes as the basic foundation for all educational and communicative action, interactive production and dissemination of environmental education contents through media, as well as firmly establishing environmental education among communication professionals, and the perspective of partnered communication with the media aiming at developing public awareness of sustainability (Brasil 2005, 2008).

Thus, the program foresees the production of communication materials by the PAP-2, aiming at their dissemination in digital environments linked to this educational program, as well as artistic actions and initiatives, including the possibility of developing information and environmental signal systems. With the purpose of guiding and broadening the reach of these activities, a proposition was made to produce journalistic material in the form of *press releases* following a standard template, aiming at facilitating transit, publication, and dissemination of the activities developed by the media, both inside and outside the university.

Besides the communication material, the program continuously supports the production of didactic materials, considering audiovisual methods and the use of distance tools to record every action, image, report, and discussion forum among the PAPs.

Considering that the program aims at reaching a large number of people, in addition to on-site meetings, it was resolved that communication technologies, as well as distance education, should be included at some point. As described by Valdívia (2008), there is an acknowledgement of innumerable benefits that can be added by information and communication technology to education, regardless of the dominant pedagogical model. They increase opportunities to learn at any time and any place; promote more fluid and permanent relationships between students and knowledge; open learning opportunities throughout life; create learning communities between students and faculty; increase opportunities for professional development; and permit the creation of new means of communication among those involved in the educational program.

Considering the target audience, it would be possible to use distance learning processes to offer participants multiple opportunities for interaction, mediation, and expression of feelings, provided by the flow of information, the diversity of discourse, and the availablity resources, which can be in print, audio, or visual forms, as well as by flexibility of time and schedules. Furthermore, virtual learning environments contribute to the development of activities that emphasize collective production, because education processes that develop at a distance are not solitary. In fact, technological tools and resources result in the subjects being more closely involved, and contribute to awareness of the need to build autonomy regarding one's own educational process. Individuals can depend on their own initiative and ability to organize the times when they interact virtually, as well as their involvement in the proposed activities and readings. A virtual learning environment using the Moodle platform is under construction, and can be accessed by program participants who are affiliated with the university.

5 Current Context of the Program and the Expected Outcomes

The socio-environmental education program for employees at USP aims to consolidate: participative socio-environmental mappings and diagnoses; moderation of problem-solving activities; permanent, connected, and continuing education; inter- and cross-disciplinary dialogue; and management-related sustainable processes, including water, energy, waste, and consumption management, among others. Every process is followed by participating research teams, who support the action-reflection-action process.

In 2013, the following took place: (i) Ten meetings with experts (PAP-1) to improve the program and make strategic connections; (ii) presentation and approval of the program by university authorities on the Bauru, Pirassununga, São Carlos,

Ribeirão Preto, and Piracicaba campuses; (iii) communication with university authorities to select/indicate the socio-environmental leadership groups at the campuses; (iv) three educational meetings with the 180 PAP-2s (leaders from the seven USP campuses) and invited experts, totaling 22 h of education covering six topics (environmental education, civilization crisis, climate change, culture industry and consumerism, public policies, and good sustainability practice at universities); (v) dissemination of the initiative through USP media (IPTV, TV USP, USP News Agency, and others); (vi) coordination of the work of six fellows (grants provided by the USP Dean's Office for Culture and Outreach), three trainees, and three educators hired for the program.

Complementarily, the "Sustainability is" project is being developed, which aims at promoting the feeling of belonging, identity, and the affirmation of values in this educational process by posting remarks and photos by program participants in partners' online spaces, regarding their perspectives on sustainability and the related practices.

The expected outcomes from the program are: (i) the creation by PAP-2s, of 25–78 on-site short-term courses (between 10 and 40 h) that take local situations into consideration; (ii) 870 simultaneous actions in environmental education and management on the campuses; and (iii) publication of educational material and audiovisual productions, combining all the experiences and outcomes of the process.

Being aware of the difficulties associated with the program, the participants in this project understand that the university must act as an example and model for society regarding the implementation of environmental management policies and processes. In this sense, USP has advanced over the last few years, utilizing a cross-sectional approach to elaborating its guidelines, programs, and actions aimed at environmental sustainability in the fields of research, teaching, and outreach.

The participative education process described herein aims at increasing the environmental perception of all USP staff through the development of their critical sense by changing their own everyday attitudes and behaviors. This process should awaken a stronger commitment to the preservation, recovery, and care of the environment and quality of life in the university's working environment and in society in general. Attaining this purpose will certainly take the university to a permanent sustainable level, thereby sensitizing and stimulating society and mobilizing movement toward perceiving environmental issues and adopting sustainable practices in daily life.

6 Discussion of the Initial Results: Commitment Indicators Within the Institution

We can affirm that the goals of the educator-environmental intervention described in the present article environmentally educating all university staff; increasing the inclusion of sustainability in university management; and encouraging sustainable

actions in the university—were fully accomplished within the first year of activity. In other words, the education process began with the education of the first learning circles (PAP-1 and PAP-2s), involving coordination by both the university coordination each campus. Also, the institution leaders became aware of the necessity for continuing the education process. At the end of 2013 the university underwent a competitive electoral process for university president and new management; the new regime was very critical of the previous administration and put several projects on hold, but did not suspend this project but continued the program in its entirety. Based upon this, we can affirm that the program passed its first sustainability test.

In order to reach all staff, capillarity architecture has been adopted, in which "people who learn by participating" (PAPs) "research their own participative action". This means that actions that have already been implemented, such as the education program for the first two circles of participative learning and the presentation of this descriptive-analytical paper by PAP-1 at an international scientific event, can also be considered indicators of the commitment that has been made to mobilize other groups in the workplace. This mobilization was conducted through monitored theoretical and practical groups, constituted as self-managed and self-analytical processes of knowledge production, based on collective action and participation.

7   Final Considerations: Challenges and Prospects for the University

The university should be an example and model for society regarding policy implementation and management processes in the environmental field. In this context, USP has advanced over the last few years, transversally creating guidelines, programs and actions whose objective is environmental sustainability in the fields of research, teaching and outreach programs.

The participative education process described here seeks to raise the level of environmental perception of all USP staff, by developing critical thinking displayed through changes of attitude and behaviors experienced in each person's daily life. This process should awaken in individuals a greater commitment to conservation, recovery and care of the environment and quality of life, both in the university work environment and in society in general. If this goal is reached, it will surely take the university to a permanent level of sustainability, sensitizing, mobilizing and encouraging society to become aware of environmental issues and to adopt routine sustainable practices.

Taking into consideration USP's scientific leadership and the dialogue which has already been established with other universities, for example, with the University Network of Environmental Education Programs (RUPEA) and at national and international events which are currently taking place coordinated by the university, it is possible that the impact of this study and intervention aimed at environmental education will move beyond the walls of the institution and have an impact beyond the actions that were planned for its own staff.

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