



LESSONS LEARNED ON RECYCLING OF SOLID WASTE PROGRAM 'USP RECICLA' OF SAO CARLOS, BRAZIL

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Abstract

Currently there is an awareness of the negative externalities of poor management of natural resources and its consequences to both present and future generations. Environmental management and technological development have advanced to provide the continued fulfillment of the economic, social and environmental well being to the world society. In many organizations, learnings coming from the establishment of environmental management systems are quickly growing up in importance. Environmental management has also been introduced in higher education institutions allowing reduction of natural resource use. In this regard, environmental education has played an important role in raising public awareness on recycling of solid wastes in academia. This research refers to a case study on the ongoing project named Recycle USP undertaken in the Sao Carlos campus of Sao Paulo University. Based on a literature review and interviews carried out with 13 program participants, the research identified lessons learned by their managers to be presented to the academic community. These lessons are considered to be important for the implementation of recycling programs in other higher education institutions in Brazil and abroad. It is possible to anticipate that the main lessons learned relate to communication, stakeholder engagement, proactivity of the manager in promoting synergy among participants, enhancement of collective learning, and dissemination of information about the program.

OUTLINE

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- Recycling initiatives in Brazilian universities
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CRITICAL POINTS OF THE PRESENTATION

- Currently there is a growing awareness on the importance of waste management at the global and local scale
- Environmental management and technological development have advanced to provide adequate alternatives and solutions for waste management
- Environmental education is been introduced in universities allowing reduction of natural resource use and has played an important role in raising public awareness on recycling of solid wastes in academia

THEORETICAL AND REGULATORY FRAMEWORK

- The mission of IES "is the education and training of decision makers of the future" [1], [2], [3]
- 1988 - Federal Constitution - cities become responsible for urban sanitation, adequate management services and solid waste, from collection to its final destination
- 1990's - RIO-92 - Treaty on Environmental Education for Sustainable Societies
- 2004 - Proposal for the establishment of general guidelines applicable to solid waste management in the country
- 2010 – Enactment of Federal Law No. 12.305/10 - National Solid Waste Policy

AMBIENTAL ACTIONS IN UNIVERSITIES AROUND THE WORLD

World

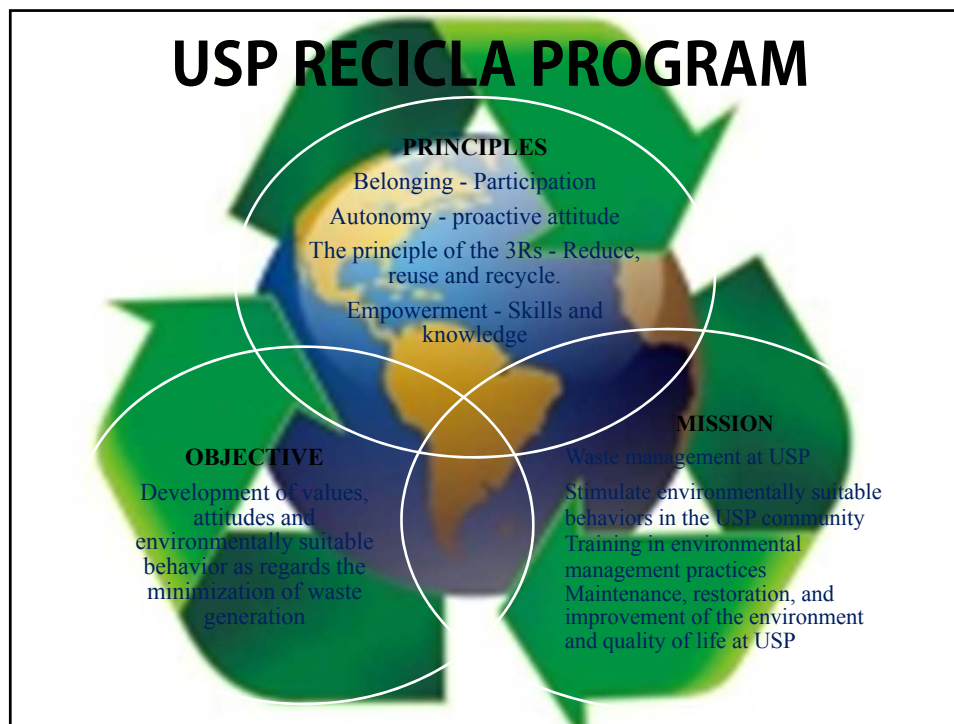
- Inter-University Program for Environmental Cooperation [4]
- Project "Ecocampus" environmental management in High Educations Institutions (HEIs) compatible with ISO 14001

Americas

- OIUDSMAE in Costa Rica - International Organization of Universities for Sustainable Development and Environment [5]
- CYTED Project (2012 - 2013) Science, Technology, Innovation and Environmental Education in Iberoamérica

Brazil

- RECIPUCRS, Office of Environmental Policy / PUC - RS
- CNPQ Project (2012 - 2015) UNIVALI, USP, and UNISINOS UNIFEBE-greening and sustainability in universities [6]
- Sustainability Platform of the University of São Paulo (USP) - USP test of sustainability and USP Recycle Program



RESEARCH PROBLEM AND ASSUMPTION

- University campuses in Brazil are generating a large amount of waste demanding internal actions and strategies on recycling and environmental management
- Since the USP Recicla Program is working well in São Carlos campus, it is assumed that the lessons learned in this program can be useful to other campuses of both public and private universities

RESEARCH QUESTION

- What lessons can be learned from the experience of professionals involved in the implantation and development of the USP Recicla Program that may be relevant to other universities interested in creating a similar waste management program?

CONCEPT OF LESSONS LEARNED

- Useful piece of practical wisdom acquired by past experience or study that is worth knowing and deserves attention [7]

OBJECTIVE

Identify

- the existing recycling initiatives in Higher Education Institutions (HEIs) in Brazil and abroad, with emphasis on universities located in São Paulo State

Identify

- The difficulties, obstacles and problems faced in the implantation and conduct of program USP Recicla of São Carlos

Analyze

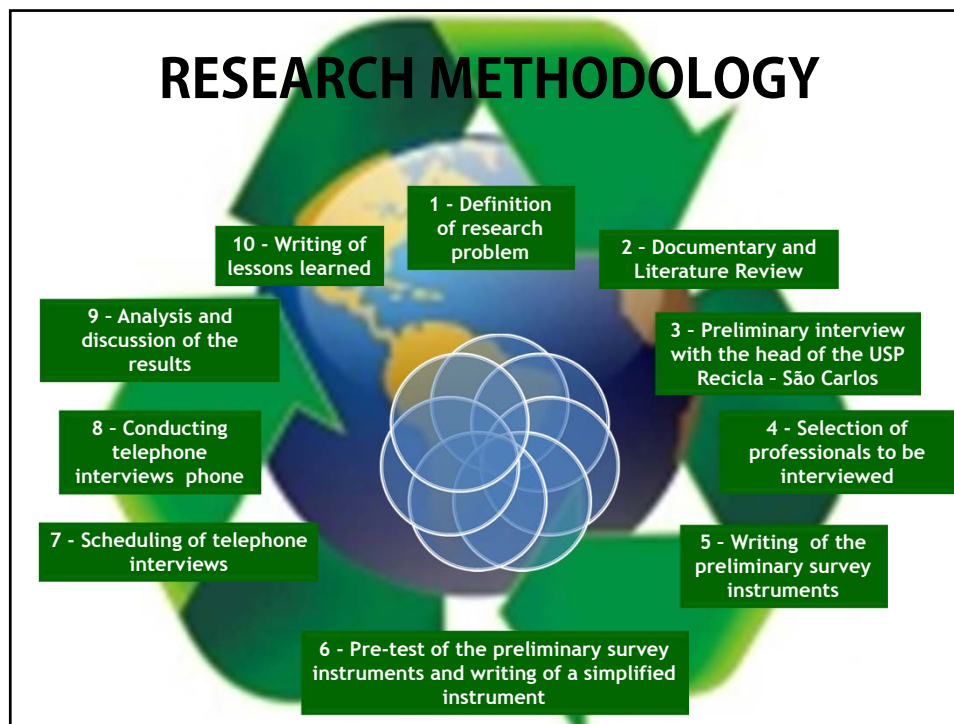
- Relevant knowledge obtained from the experiences of the various HEIs, especially from the USP Recicla of São Carlos in order to write the lessons learned

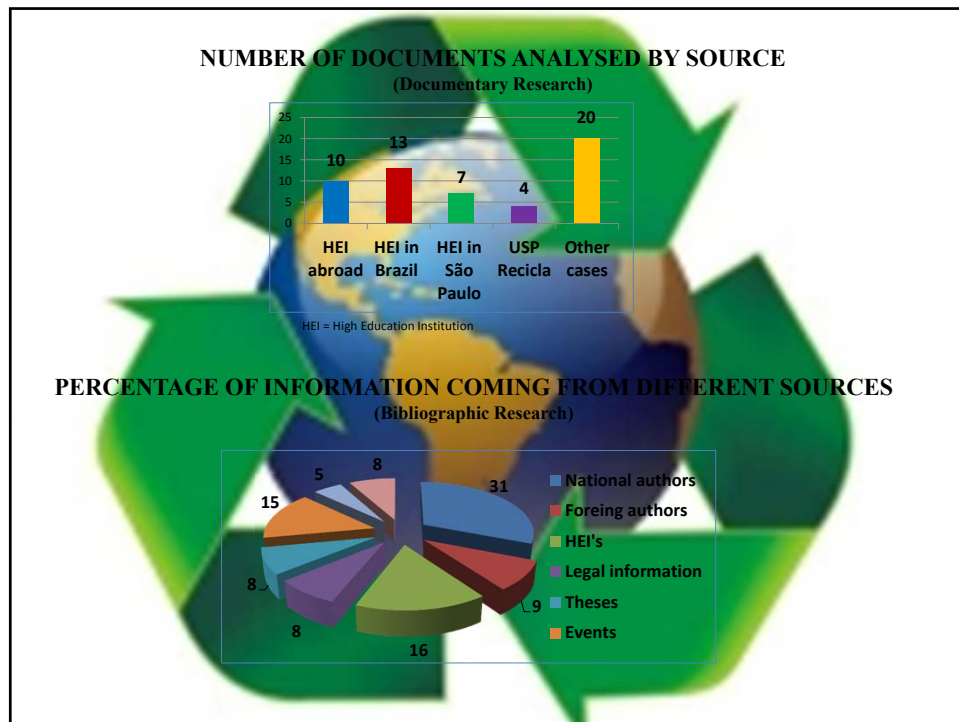
MOTIVATIONS OF THE STUDY

- 
- Environmental management is progressively being introduced in HEIs allowing waste recycling and reduction of natural resource use
 - In many organizations, learnings coming from the establishment of environmental management systems are quickly growing up in importance
 - Environmental education has played an important role in raising public awareness on recycling of solid wastes in academia

RESEARCH METHODOLOGY

- 
- Qualitative research
 - Case study based on
 - documentary review
 - literature review
 - interviews with experienced participants of USP Recicla Program of São Carlos





SOLID WASTE RECYCLING IN BRAZIL

- 60% - counties in the country have some initiative selective collection
- 2% - the amount of county solid waste that actually returns to the productive chain

According to [8]:

51,4%	Matéria Orgânica
13,5%	Plastic
13,1%	Paper, Cardboard and Tetra Pak
2,9%	Metal
2,4%	Glass
16,7%	Other materials

RECYCLING INITIATIVES IN UNIVERSITIES WORLDWIDE

- 
- University of Lisbon / Portugal - UL - ECOPOINTS
 - Universidad Autónoma de Madrid / Spain - UAM - ECOCAMPUS
 - University of Borås / Sweden - Biotechnology
 - University of Kansas / USA - Recycling on campus
 - University of Bordeaux / France - Waste generation and consumption on campus
 - University of Wisconsin / USA - Campus Ecology
 - Brown University / USA - Brown is Green

RECYCLING INITIATIVES IN UNIVERSITIES WORLDWIDE cont.

- 
- International Organization of Universities for Sustainable Development and Environment - IOUDSMAE in San José / Costa Rica
 - COPERNICUS Letter- interuniversity program by European partner universities
 - Environmental Association of Universities and Colleges - EAUC - UK
 - Alianza de Redes Iberoamericanas de Universidades por la Sustentabilidad y el Ambiente
 - Universidade de Malardalen/Suécia – 1st. University in the world - ISO 14001
 - Alternative University Appraisal – AUA – Community of Asian universities

RECYCLING INITIATIVES IN BRAZILIAN UNIVERSITIES

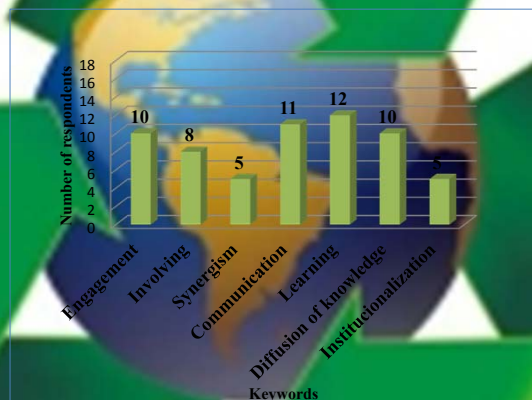
Percentage of Brazilian universities having an Environmental Management System (EMS) [9]

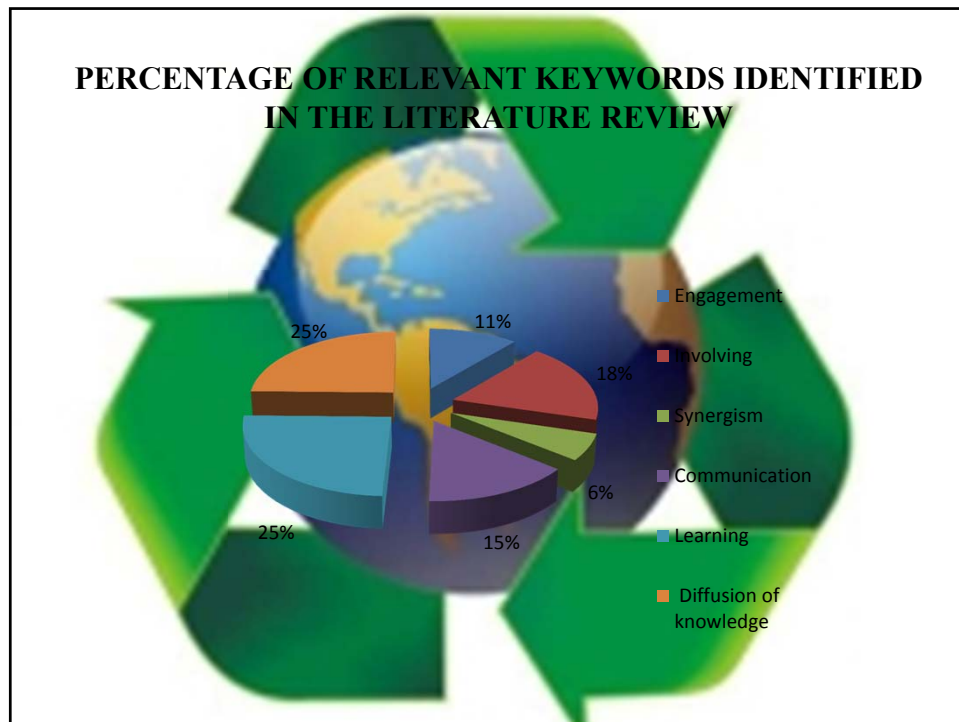
- 54,7% - does not have it
- 25,3% - have it
- 20% working on it

Universities that have a solid waste recycling program

- University of São Paulo – USP Recicla program
- University of Santa Catarina – A3P/UFSC
- University of Paraná – Plan for solid waste management
- Pontifícia Universidade Católica de Minas Gerais – E-Waste Recycling program

KEYWORDS EMPHASIZED BY THE SURVEY'S RESPONDENTS





RESULTS: LESSONS LEARNED

Lesson 1

For an effective conduction of environmental sustainability practices, the implantation and maintenance of environmental management systems in universities must observe geographical, administrative and cultural characteristics of each institution or campus.

Lesson 2

In the university environment, the educational aspect of waste recycling program can be negatively affected by both financial and regulatory actions that are linked to political and administrative procedures of each institution.

Lesson 3

The singularities of each university community interfere in the process of deploying and managing of the results of waste recycling programs from campus to campus.

RESULTS: LESSONS LEARNED

Lesson 4

Overcoming internal administrative and cultural barriers of each campus or department is essential to the development and maintenance of a waste recycling program in an university.

Lesson 5

The cooperation among departments in an university is a prominent factor for promoting the success of environmental sustainability programs relating to waste recycling.

Lesson 6

The institutionalization of the USP Recicla in all campuses of USP and its expansion outside of the university walls (e.g. partnership with collector's cooperatives) are factors that support the mission of Program and also gives visibility of it to the outside communities.

RESULTS: LESSONS LEARNED

Lesson 7

The exchange of experience among universities involved with environmental sustainability practices promote both the spread of knowledge and intellectual development among the participants.

Lesson 8

The proper use of communication tools is important for promoting environmental awareness and improving knowledge in universities.

FINAL REMARKS

- The design of the USP Recicla was based on the principle of 3 R's, which has guided other programs for solid waste management at local, national and international level.
- The major lessons learned deal with positive aspects and also with others that deserve attention, as follows:

Positive aspects promoting success of the program:

- Efficient use of communication tools
- Exchange of experiences among institutions and program participants
- Collaboration among different departments
- Institutionalization and expansion of the program to the outside community as ways to give public visibility to it
- The waste recycling program in an academic environment works as a practical environmental education program carried out on a daily basis

FINAL REMARKS

Negative aspects that may affect the development of program:

- The geographic location, and administrative and cultural characteristics of institutions or campuses can negatively affect or even pose barriers to the program expansion or continuity

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