FOURTEEN CONSECUTIVE YEARS TEACHING ENVIRONMENTAL RECOVERY: AWAKENING A NEW PERSPECTIVE ON STUDENTS FROM DIFFERENT BACKGROUNDS

QUATORZE ANOS CONSECUTIVOS LECIONANDO RECUPERAÇÃO AMBIENTAL: DESPERTANDO UM NOVO OLHAR EM ALUNOS DE DIFERENTES FORMAÇÕES DE GRADUAÇÃO

CATORCE AÑOS CONSECUTIVOS ENSEÑANDO RECUPERACIÓN AMBIENTAL: DESPERTANDO UNA NUEVA PERSPECTIVA EN ESTUDIANTES DE DIFERENTES FORMACIONES DE PREGRADO

Alexandre Marco da SILVA [1]
e-mail: alexandre.m.silva@unesp.br

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[1] São Paulo State University (Unesp), Sorocaba – SP – Brazil. Full Professor at Department of Environmental Engineering, Institute of Science and Technology of Sorocaba, Unesp.

ABSTRACT: Considering the elevated rate of environmental degradation worldwide, and on the other hand, (i) the necessity to develop and execute projects, programs, and actions dedicated to environmental recovery (ER) and (ii) the moment we are living in (decade of Ecological Restoration established by UN), we presume that it is appropriate disseminating actions on teaching and training people on subjects related to the topic. Thus, we have the results of a period of fourteen years dedicated to teaching ER as a discipline to postgraduate students at a Brazilian public university. From 2009 to 2022, 184 students from 29 different academic backgrounds have completed the course. The course consolidates an integration of concepts related to the Recovery of Degraded Environments, providing the student the opportunity to insert concepts about ER into their academic projects, apply the concepts in their professional life, and have a different view concerning the process of environmental degradation.

KEYWORDS: Postgraduate teaching. Recovery of Degraded Environments. Training for Restoration of Degraded Environments.

RESUMO: *Considerando o elevado índice de degradação ambiental em todo o mundo, e por outro lado, (i) a necessidade de desenvolver e executar projetos, programas e ações voltadas à recuperação ambiental (RE) e (ii) o momento que vivemos (década da Restauração Ecológica estabelecida pela ONU), presumimos ser oportuno divulgar ações de ensino e formação de pessoas em assuntos relacionados ao tema. Assim, temos os resultados de um período de quatorze anos dedicados ao ensino de ER como disciplina para alunos de pós-graduação de uma universidade pública brasileira. De 2009 a 2022, 184 alunos de 29 formações acadêmicas diferentes concluíram o curso. O curso consolida uma integração de conceitos relacionados à Recuperação de Ambientes Degradados, proporcionando ao aluno a oportunidade de inserir conceitos sobre ER em seus projetos acadêmicos, aplicar os conceitos em sua vida profissional e ter uma visão diferenciada sobre o processo de degradação ambiental.*

PALAVRAS-CHAVE: *Ensino na Pós-Graduação. Recuperação de Ambientes Degradados. Treinamento para Restauração de Ambientes Degradados.*

RESUMEN: *Considerando el alto índice de degradación ambiental a nivel mundial, y, por otro lado, (i) la necesidad de desarrollar y ejecutar proyectos, programas y acciones orientadas a la recuperación ambiental (ER) y (ii) el momento en que vivimos (Decenio de Restauración Ecológica establecido por la ONU), presumimos que es oportuno difundir acciones para enseñar y capacitar a las personas en temas relacionados con el tema. Así, tenemos los resultados de un período de catorce años dedicado a la enseñanza de las ER como disciplina a estudiantes de posgrado de una universidad pública brasileña. De 2009 a 2022, 184 estudiantes de 29 orígenes académicos diferentes completaron el curso. El curso consolida una integración de conceptos relacionados con la Recuperación de Ambientes Degradados, brindando al estudiante la oportunidad de insertar conceptos sobre ER en sus proyectos académicos, aplicar los conceptos en su vida profesional y tener una visión diferente sobre el proceso de degradación ambiental.*

PALABRAS CLAVE: *Docencia de Postgrado. Recuperación de Ambientes Degradados. Capacitación para Restauración de Ambientes Degradados.*

Introduction

Faced with the advanced state of environmental degradation, humanity today lives in a paradigm trying to turn to environmental recovery. The recovery of degraded environments has grown worldwide, especially at the beginning of the 21st century. Aiming to facilitate, encourage, and boost policies and actions aimed at environmental recovery, the United Nations has declared the period 2021–2030 the decade of restoration (https://www.decadeonrestoration.org/).

Recovering degraded environments constitutes an essential element for the conservation of environmental resources through several types of interventions in the degraded environment and has gained prominence in the management of public policies (Guerra *et al*., 2020; Lewis *et al*., 2023). The demand for technically qualified professionals in the Recovery of Degraded Environments will grow (Höhl *et al*., 2020; Marshall *et al*., 2022). However, rebuilding or restoring degraded environments requires technical capabilities and scientific knowledge (Sansevero *et al*., 2018; Fu, 2021).

Strategically, education constitutes one of the main investments (Lavendel, 1999; Kondolf *et al*., 2013). Training people who have a vision of environmental recovery constitutes a promising strategy that enables and encourages people to have technical/critical knowledge about the process of environmental degradation and ways to solve such problems (Kensler; Uline, 2019; Gerwing *et al*., 2022). Once fortified with technical knowledge, these professionals have the potential to significantly influence the understanding of ecological processes, as well as include the variable "environmental recovery" in projects that demand such actions and/or approaches (Speldewinde, 2010; Blignaut; Aronson, 2020).

Among several alternatives to be considered in terms of technical training and improvement, there is the possibility of offering disciplines for undergraduate, and postgraduate students (masters or doctorate). In several countries, including Brazil, technical teaching of environmental recovery is concentrated in colleges and universities, in undergraduate or, mainly, postgraduate courses, many of them linked to courses in Environmental Engineering, Forestry Sciences, and Soil Science, among others (Mulholland, 2016; Sansevero *et al*., 2018).

The science and technology of recovering degraded environments is an extensive and important part of Environmental Engineering and Ecological Engineering since recovering degraded environments means "(re)building new environments", and requires knowledge of Pedology, Water Resources, Biogeography, Ecologies (Populations, Communities, Landscape,

among others), Climatology, Geology, Geomorphology, among other sciences. Therefore, it is originally a multidisciplinary issue.

Due to the multidisciplinary origin and nature, we assume that the kind of the course completed by the student's undergraduate education is important, but not fundamental, to participate as a master or doctorate student in a postgraduate-level discipline of Environmental Recovery, that is, practically any bachelor is able and welcomed to enroll and participate in the classes, develop the planned activities, and complete the course successfully.

On the other hand, there are the questions: (i) Would this issue be of general interest, or just students with a specific background have an interest in the subject? (ii) For a discipline offered in a postgraduate course, what professional could be interested in acquiring knowledge about the matter? (iii) Would students with little or no training in Ecology or Environmental Sciences have the same point of view and the same performance as students with solid training in these subjects? Once motivated to answer such questions, I organized a database of the fourteen consecutive years in a subject taught in a postgraduate course that was used to rescue the academic profile of students who showed interest in taking the subject.

Materials and Methods

I elaborated the database containing the lists of students of each year using spreadsheets archived by the professor author of this study. I obtained information on each student's undergraduate education from the Brazilian National Council for Scientific and Technological Development (CNPq) Lattes platform. Such a system is an open platform and free of charge for registrations or queries of curriculums (Link: https://buscatextual.cnpq.br/buscatextual/busca.do). This platform requests the full name of the person to provide information on background and publications, among other technical and academic data. I considered data specifically regarding the students who were officially enrolled and completed the course.

Furthermore, regarding the content taught in classes, as well as the feedback of the students, I achieved it from notes recorded and archived year after year, and the monographs presented by the students and archived by the professor.

I organized the data in datasheets for posterior analysis.

Results

A brief explanation about the Unesp and post-graduate programs focused on this study.

The university officially entitled Universidade Estadual Paulista (São Paulo State University) Júlio de Mesquita Filho (acronym Unesp) is, since its origin (1976), a multi-campus university. In 2023 there are 76 university units spread across 24 municipalities in the State of São Paulo. Since the beginning of work on the Postgraduate Program in Civil and Environmental Engineering (2009), the proposal was for the course to be multi-campus, always using a video conference system. The characteristic of the program to be multi-campus meets the characteristics of the university and facilitates integration among the campuses. The campuses Bauru, Sorocaba, and Guaratinguetá offer undergraduate engineering courses (Bauru and Guaratinguetá have bachelor's in civil engineering and Sorocaba bachelor's in environmental engineering) and were the first to offer the postgraduate program. Years later, the campuses of Rio Claro and São José dos Campos (both also schools of bachelor's in Environmental Engineering) became part of the postgraduate program.

Since then, students from these campuses have been enrolling in the discipline "Recovery of Degraded Areas", which is included in such a postgraduate program (master and doctorate). In 2019, there was the inclusion of students from another graduate program offered on the Campus Sorocaba: Environmental Sciences.

The facilities provided by the university.

Classes have taken place in videoconferencing systems. The time span 2009-2019 was the period pre-pandemic. During such a time, the campuses participants in the postgraduate program "Civil and Environmental Engineering" provided rooms (classrooms), and the students had to go to one of the campuses to attend the classes. This fact has featured the disciplines of the program as remote, but it is not "distance learning".

Specifically for the discipline focused on this study, in each lecture the professor was physically in the classroom of the Campus of Sorocaba and the students of the other campuses also were compulsorily in a classroom. In each classroom, there were two screens (TV), in the first one the professor's image was projected and in the second screen the class content was projected. With the advent of the pandemic, the classes were continued, and they had to change to the "home system". We always used the Google meeting system since each student was in

their respective home. Such a system has persisted until 2022. Regardless of whether the pandemic or not, the classes were always synchronous.

The course: Aim and teaching strategies.

The course has aimed to provide knowledge and skills to students to:

(i) diagnose degraded areas and engineer workable solutions to correlated problems,

(ii) propose suitable solutions to solve the problems of environmental degradation detected in their respective academic works (dissertations or theses),

(iii) integrate a team of environmental technicians (restorers or not) to design and implement environmental recovery projects in diverse ecosystems and spatial scales,

(iv) having the sensibility and expertise to consider environmental recovery as an alternative and incorporate this issue into projects and programs by public or private institutions.

Complementarily, the perspective is that after accomplishing the course, the students are capable of comprehending the ecological dynamics involved in the degraded area recovery process (that might be different from the ecological dynamic occurring in a pristine ecosystem); know the steps and rules involved in the entire technical/bureaucratic process of Recovery of a Degraded Area (at least in Brazil); know some environmental indicators about the degradation stage of an area; and to elaborate and implement a Technical Plan for Recover a Degraded Area.

The development of the course is through expositive classes, with the presentation of basic concepts, laws, techniques of environmental recovery, and case studies. Complementarily, the professor invites students to read chapters from books, handouts, manuals, national and state laws, and resolutions, as well as scientific articles.

In the first class (inaugural), there is a detailed presentation of the professor (name, background, research interests). Likewise, each student describes her(his) name and origin, background, and he/she is invited to talk about any experience with the issues of the discipline (Recovery, Restoration, Rehabilitation), and the perspectives about the course. Subsequently, the professor also presents all content to be developed, the evaluation system, and the planned tasks for the students along the course. On this same occasion, the professor also explains all activities to be considered for computing the final grade.

In the second class, the class (group) of students is divided in smaller groups. Each group prepares a seminar on the topic of the class (see Chart 1 for the syllabus). These seminars take place in weeks 3 to 8. The content to be presented in the seminar constitutes a part of the general

content of that day's class. For example, on the day when the theme of the class is "Ecological Restoration considering environments degraded by fire", before this class a group of students presents a seminar on "Ecological Basis for...". The preparation and presentation of such seminars aim to provide a levelling (or diminish the disparities) in terms of background among the students since students have diverse levels of knowledge due to their undergraduate background. Moreover, in the classes that take place between weeks 3 to 8, recovery techniques for different environments and situations are presented.

From classes 9 to 12, the professor returns to the presentation of the contents in the two parts of the classes (no more seminars). In the class of week number 9, after presenting topics regarding recovery techniques (classes 3 to 8), the professor explained the topics regarding the Projects for the Recovery of Degraded Areas (abbreviation in Portuguese: PRADA) and presented the rules for the development of the work final (practical). Complementarity and when possible, there are the participation of experts from institutions such as the Environmental Sanitation Company of the State of São Paulo (acronym in Portuguese: CETESB). The CETESB is the state corporation responsible for the environmental policy and legislation in São Paulo State, and one of the most active agencies on the issue of environmental protection in Brazil, illustrating the importance of bringing a technician from such an agency as a speaker.

Chart 1 – Topics developed in the discipline.

Week	Topic (each topic has a time load of 2 hours)	Developed by	
		Professor	Students
1	Class 1a – presentation	x	
	Class 1b - initial concepts	x	
2	Class 2a - Investigation of environmental liabilities: principles, technical standards, and procedures	x	
	Class 2b - Decontamination techniques (stations and urban areas)	x	
3	Class 3a - Concept of Soil (morphological, physical, and chemical parameters)		x
	Class 3b - recovery of degraded soils (densified, eroded, contaminated)	x	
4	Class 4a - Ecological Bases: Population, Community, Ecological Interactions, Ecological Niche, Support Capacity, Biodiversity		x
	Class 4b - Use of vegetation and fauna to recover degraded areas - riparian forests.	x	
5	class 5a - Ecosystem - Concept and its evolution - Ecological Succession (Primary and Secondary, Climax and Disclimax), Concept of Ecological Resilience		x
	Class 5b - recovery of forest areas degraded by fire	x	
6	Class 6a - Mining - main types and associated impacts.		x
	Class 6b - recovery environments degraded by mining	x	
7	Class 7a - Water Resources - concepts about water quantity and quality - associated impacts		x

	Class 7b - recovery of degraded water bodies	x	
8	Class 8a - Soil-plant-atmosphere interaction		x
	Class 8b - Phytoremediation techniques for water and soil decontamination.	x	
9	class 9a - Recovery Plan for Degraded Areas - concept and technical aspects (role of CETESB)	x	
	Class 9b - practical work (in groups - this year individually) - description and objectives / CETESB seminar	x	
10	Class 10a - Use of post-recovery areas	x	
	Class 10b - Landscaping Techniques applied to the Recovery of Degraded Areas	x	
11	Class 11a - environmental monitoring - principles, methods and objectives	x	
	Class 11b - monitoring of recovered areas	x	
12	Class 12a - time for field, practical work	x	x
	Class 12b - time for field, practical work	x	x
13	Class 13a - presentation of seminars (practical works)		x
	Class 13b - presentation of seminars (practical works)		x
14	Class 14a - presentation of seminars (practical works)		x
	Class 14b - presentation of seminars (practical works)		x
15	Class 15a - final test		x
	Class 15b - final test		x

Source: Prepared by the author.

In class 10, professor introduces subjects regarding "use of the post-recovery area", citing unsuccessful and other successful cases. The professor and students discuss about landscaping techniques that might support projects especially in the field of rehabilitation, since combining scenic beauty and ecological functionality is an exciting potential that landscaping has and that can collaborate in environmental recovery projects.

In the week eleven class, the professor presented related topics on post-recovery environmental monitoring. Subjects such as the concept of ecological indicators, ways of collecting data (correspondence with current legislation), and the importance of the theme of PRADA in terms of organization, costs, and schedule are discussed. Indicators are paired for the physical, biological, and anthropic environments of terrestrial and aquatic ecosystems. The subject "Adaptive Management" and its insertion in the context of Environmental Recovery is also addressed.

The class time of week twelve is dedicated to the development of the end-of-course project that each student must present, complemented by a time load of work at home to finish the written part and the presentation of the work. In weeks 13 and 14, classes time are dedicated to the presentation of individual seminars. In week 15, the final test is held, also individually.

The content of discipline – features, chronicle, and evolution.

Since the beginning of offering the discipline in the postgraduate program, part of the content has been maintained as the original until the end of this research (middle of year 2023), while other topics were included progressively year by year (Table 1). Since the commencing, the initial idea was to offer a hybrid course, with both technical and academic approaches. In Environmental Recovery the technical and academic sides are always together, since the subject is simultaneously technical and academic, and being subject to the formulation of laws and regulations. Hence, in the discipline, there is an opportunity to present and discuss elements and facts that are realistic and current in terms of environmental degradation, from local problems to problems on a global, planetary scale.

Table 1 - Key issues introduced and developed in the academic semesters along the timespan. The first row means the year, from 2009 (09) to 2022 (22).

Topic ↓ / Year →	09	10	11	12	13	14	15	16	17	18	19	20	21	22
Bioremediation														
Concepts, differences in recovery, rehabilitation, and restoration														
Degraded areas recovery Projects														
Environmental legislation concerning restoration, recovery actions														
Environmental liabilities														
New uses after implementing actions of recovery														
Differences among the approaches “passive restoration” and “Active, oriented restoration”														
The technique of “do nothing” and the conduction of natural regeneration														
Nucleation techniques														
Techniques of direct seeding and planting seedlings														
Recovery actions in areas degraded by mining														
River restoration														
Soil decontamination														
Soil recovery														
Structure and functioning of natural ecosystems														
SDG and Relation with Recovery of Environmentally Degraded Areas														

Source: Prepared by the author.

In terms of assignments related to end-of-discipline, the most frequently recorded theme is the presentation of rehabilitation proposals for impacted areas, mostly urban. Aspects related to water or soil pollution (incorrect garbage disposal) are what normally call attention and that

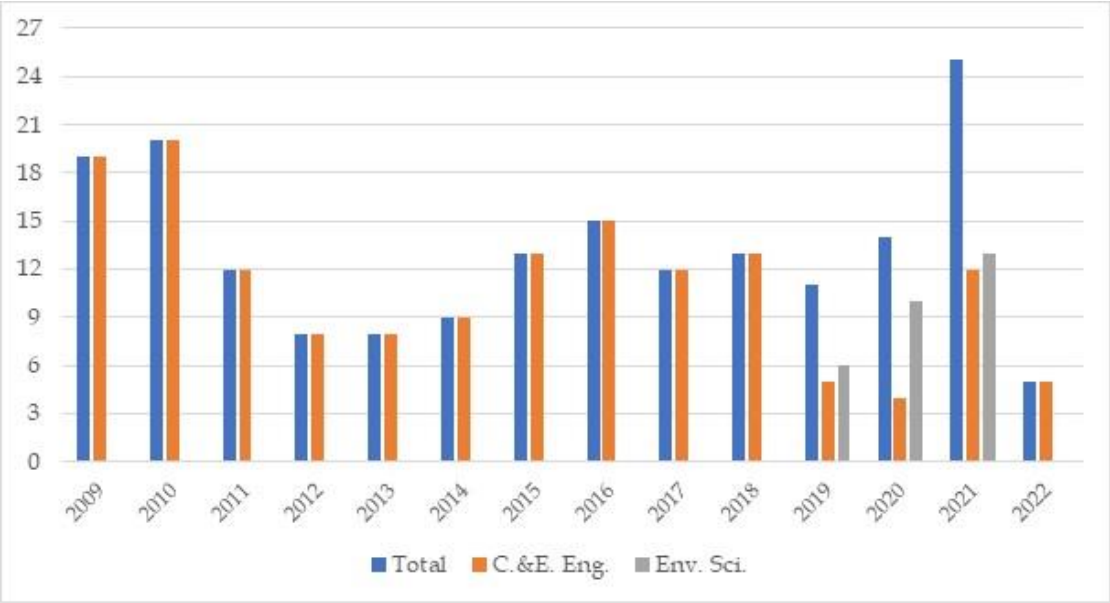
arouse interest in solving through a project. Concern about revegetation with native species also appears in the projects, with a lower frequency.

Students are usually concerned about following current laws and regulations and having perspective on the system. Some of them are motivated and concerned with making a project where the result is an immediately beautiful and usable place, which is why rehabilitation projects predominate, rather than proposals of recovery or restoration. They have a shallow view that a recovery project can take years to complete... often reflecting a short-sighted view and far from an orthodox approach.

Concerning the students and their undergraduate training

In the period of this study (2009-2022), a total of 184 graduate students enrolled and completed the course. The annual average number of students is 13. In 2021 we had the highest number of participants (26), while in 2022 the smallest (5) (Graph 1).

Graph 1 – The number of students enrolled in the discipline "Recovery of Degraded Areas" year by year in the period from 2009 to 2022. In the period from 2009 to 2018, the orange and blue columns are always coincident once there were only students from the graduate program in Civil and Environmental Engineering. From 2019, there was also enrolment of students from the program Environmental Sciences.



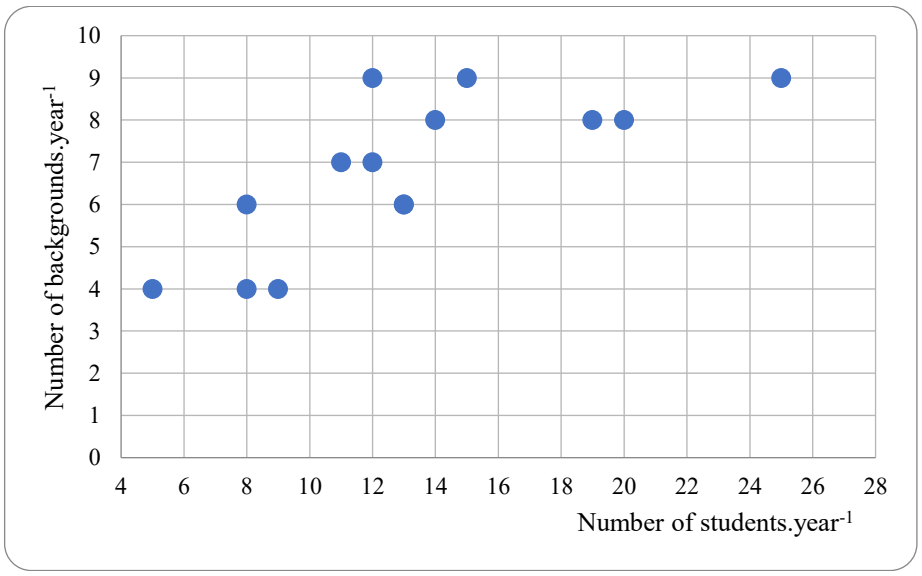
Source: Prepared by the author.

I registered a total of 29 different academic backgrounds. The most frequent backgrounds were Civil Engineering (51 students), Environmental Engineering (49 students), and Biology (27 students). Of the total of students, 69% belong to one of these three

backgrounds while those 16 backgrounds had only 1 representative. I observe a positive relation (r2=0.75, N=14, significant p=1%) between the number of enrolled students and the number of backgrounds (Graph 2).

Less than 25% of the students enrolled in the discipline showed any kind of experience with Environmental Recovery. Only a fraction of the students (bachelor's in environmental engineering) stated to have taken Environmental Recovery as a specific and mandatory discipline in their undergraduate. Some students (Environmental Engineering, Agronomy, Geography) declared to have studied Environmental Recovery as a topic in a discipline in their undergraduate (discipline linked to the Management of Natural Resources). In terms of professional experience, few students showed some expertise or previous professional experience in the issue (less than 10%).

Graph 2 – The scatter plot presents thirteen points, although we have fourteen. The data for the years 2015 and 2018 were identical (13 students enrolled, belonging to 6 backgrounds) and the points overlap each other.



Source: Prepared by the author.

Indicators of students' comprehension of content and technical point of view

Analysing and discussing the projects presented by the students showed that most of them were concerned about making environmental adjustments in the areas focused on for the work, but with a territorial organization perspective and aiming at the local scenic beauty, security, and the possibility of use by users. The study area consists usually of an urban area, being the stretch of a stream devoid of vegetation, a land that was abandoned at the time of preparation of the work, or even a very poorly maintained square. There is always a concern to

leave a space reserved for planting trees, but also the concern to install equipment for playgrounds, seats, and other structures. In other words, they usually focus on transforming the place into a multifunctional space.

Although in some situations it may be possible, students who have undergraduate training distantly related to subjects related to the Recovery of Degraded Areas do not bring aspects or elements linked to their student experiences to the discussions and/or projects.

Discussions

The adopted education system has been remote. This system has as advantage allowing the participation and interaction of students from anywhere. This is relevant because there is the possibility of knowing the ecological reality and the degradation process of diverse places. In this diversity of places, it has been interesting to observe the diversity of situations and causes of degradation of the studied sites described by the students. Comparatively, Knackmuhs; Farmer; Reynolds (2017) encountered a comparable situation, and they argued that different places reflect different social, economic, and environmental legislation situations, and the students tend to report such situations.

Although for this discipline the effort and commitment of the student are much more important than graduation background (Blandy; Congdon; Krug, 1998), having skills in Ecology is advantageous for a maximum comprehension of all content (SPELDEWINDE, 2010). Having students from other undergraduate backgrounds is interesting and important. The justificative is because the recovery process of a degraded area is an Environmental Engineering or Ecological Engineering project (Allen; Giampietro; Little, 2003) and should include sociology contents, arts, and attend legislation (Kensler; Uine, 2019; Schultz *et al*., 2022). Hence, having only a specific ecological vision is a limited vision, once that the actions of reconstruction of a degraded environment should be formulated also aiming to attend aspirations of local owners and/or workers, should satisfy the goals of the local society, be cost-effective and desirably lucrative (Riley; Spencer, 2000; Bustamante *et al*., 2019).

The planning, execution, and monitoring of restoration efforts strongly vary on the context and the diagnosis of the region concerning reference ecosystems (Bustamante *et al*., 2019). Hence, considering the conceptual differences between rehabilitation and restoration (Klaus; Kiehl, 2021) it is possible to state that the projects presented over the years are usually closer to the concept of rehabilitation. There was a lesser amount of work with a proposal to

make the place with ecological characteristics identical to the pre-degradation state (tying to the concept of restoration). This reveals that the participants of the course over the years have had a different view of the environment, which is remarkably interesting and provides a broad and diversified discussion. Considering that environmental recovering-related activities are interventions that can be implemented following principles of Design (Schaefer; Gonzales, 2013), such characteristics of the projects (rehabilitation or restoration) are not excluding, but complementary among them, since in both cases the interventions are devoted to cease and reverse the degradation and the designers of the projects have some liberty to elaborate a project according to his/her expertise, following the current legislation if existent.

Hence, suggestions for improvements and the incorporation of technical details can make the conceptions between the concepts of rehabilitation and restoration closer to each other and the rehabilitation projects with intelligently placed details. For example, when indicating which species could be planted, the indication of native species with known origin and the contraindication of potentially invasive species could collaborate at least slightly with the conservation of local biodiversity. Also, considering the idea of structures and solutions based on nature, or SBN (Sowińska-Świerkosz; García, 2022) for both terrestrial and aquatic ecosystems such approach (SBN) can favor the restoration of important ecological processes (soil water infiltration, nitrogen cycling in water bodies).

In Brazil, and in other regions too, working with Environmental Recovery is usually not a specific or exclusive occupation. The activity is part of a set of other activities that a technician currently develops in his professional activities, along with environmental licensing projects, environmental diagnoses, management plans, and environmental impact studies, among others. But some work on specific projects in environmental recovery or some subject related to it (for example, collecting seeds, producing seedlings, manufacturing equipment, materials, or parts for use in recovery works, such as geotextiles, and hydroseeding, for example). However, regardless of working specifically in the area or having the subject as part of their work routine, the technician or consultant will always need up-to-date technical knowledge on the subject. Linked to this subject, it is always commented on in classes that developing environmental recovery projects in a team, especially a multidisciplinary team, is an excellent strategy and is highly valued by inspection bodies or agencies, at least in Brazil. The projects that were presented in the discipline before the pandemic because they were done in teams, were usually more robust and complete, proving the fact.

In terms of future challenges, we mention that the recovery of degraded environments has grown all over the world since the beginning of the 21st century. To facilitate, encourage, and promote policies and actions aimed at environmental recovery, the United Nations declared the period 2021–2030 the decade of restoration (https://www.decadeonrestoration.org/). Hence, keeping research and mentioning the policies and approaches associated with this large program being developed on a world scale is an exciting challenge in terms of keeping information up to date. The Society for Ecological Restoration (SER) constitutes an institution that promotes and disseminates a lot of case information throughout the world, a lot of it with a strong and consistent pedagogical context.

Additionally, climate change is a reality that has been driving different approaches regarding a scenario that is not perfectly accurate as to how it will be. Adapting and mitigating climate changes will necessitate imagination, culture, and a lot of skills and knowledge (Glotfelty, 2016), and the development of intelligent solutions to recover, rehabilitate, or restore currently degraded environments requires a lot of research and teaching efforts.

Final Remarks

Environmental Recovery is the practice of recovering essential ecosystem structures and functions in environments that have been degraded by several modalities of disturbances or injuries. It is an issue or discipline that needs to be continually updated in terms of data, approaches, and technologies. This revision should always be passed on to students. It is also necessary to enable the students to understand and answer their doubts, anxieties, and experiences in environmental recovery or related areas.

The analysis of the collected results showed that some professionals are more interested in the theme, although a wide range of professionals have already shown interest. Although Knowledge about Ecology is the basis for the development of "Environmental Restoration" as a discipline, it was noted that the professional profile (or graduation training) had less importance in understanding the class content and in the performance throughout the academic period of the discipline. Personal dedication to attending classes (attendance, punctuality, participation) were the aspects that mattered in the students' performance. At the end of each academic semester, the impression is always very similar: the students with the best performance and final grades are always those who are involved in the subjects and try in the

tasks and tests, regardless of whether they have a more or less accurate level of knowledge about ecology, soils, water resources or other related matters.

The teaching strategy used here can be used in other education institutions to provide training to expand knowledge and skills on the subject. The discipline consolidates an integration of concepts directly and indirectly related to the Recovery of Degraded Environments.

In addition, it inserts in the participant the importance of controlling the process of environmental degradation, whatever it may be. Technically, it also includes a vision of the possibility of including goals and actions for environmental recovery in the most diverse projects, aiming at an environmental adjustment in terms of ecological balance.

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