



Seminars In Education for Sustainability Aimed at Basic Education Teachers, as a Community Service Involving Postgraduate Students

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Article Info

Received:

23 May 2023

Accepted:

13 November 2023

Published:

15 November 2023

DOI:

10.14710/jsp.2023.20855

Presented in the 9th International Workshop on UI GreenMetric World University Rankings (IWGM 2023)

Abstract. The teaching profession as a decisive role in the construction of sustainability as a civilizing model. The present community service project aims to implement a teacher training and updating process on sustainability issues and teaching tools for environmental education aimed at Basic Education teachers. The methodology was structured in two stages: 1.- Development of the teaching training and updating process, considering institutional needs and emerging disciplinary themes; 2.- Process evaluation. The seminar was developed with the participation of 112 teachers from different educational units in the Province and included conferences on Education for the SDGs, Education for the conservation of biodiversity and climate change, Education for responsible consumption and Horizontal Education. For their part, postgraduate students developed six workshops on didactic strategies such as simulation, comic strips, bulletin board, creation of terrariums, role playing and asking game. The evaluation applied after the seminar showed high acceptance of the activities carried out by trained teachers and postgraduate students. In the next training sessions, postgraduate students are expected to go to the educational communities of the schools to contextualize the training. Finally, the strategy made it possible to strengthen university community services that promote sustainability

Keyword:

Community Service, Teacher Training, Environmental Education

1. Introduction

The integration of extension with teaching and research functions constitutes a challenge for Latin American public universities that must give effective responses to demands of society [1]. The community service programs must be linked to teaching

functions, both undergraduate and postgraduate. In this way, the institution contributes to transforming realities promoting the sustainability and the students have the opportunity to train in interaction with real situations.

This article presents an experience of training basic education teachers, as a university extension project, developed by students of the Master's Program in Environmental Education of Universidad Técnica del Norte, located in the city of Ibarra, Imbabura Province, Ecuador. This is a public university that serves an estimated population of more than 15,000 students in virtual and face-to-face modality, and that has included sustainability within its educational model [2], which has led it to undertake actions within a model of sustainable university management [3].

The Environmental Education Master Program was created in 2021 and in its curricular design was conceived to integrate the functions of teaching, research and extension in projects to be developed in real contexts and that would contribute to solving local needs [4]. In its curriculum, the Practical work subject contemplates the implementation of an environmental education project that contributes to strengthening the University-Community relationship promoting sustainability. In this case, a response was also given to the need expressed by the Local Consultative Council for Environmental Education (LCCEE) for training for teachers of all levels who are affiliated with this organization. The LCCEE is a government entity that integrates various provincial actors that implement environmental educational processes, including Basic Education institutions.

The teaching profession has a decisive role in the construction of sustainability as a civilizing model. However, for their active participation in promoting the concept and practical implications, it is necessary to have the competencies to undertake these processes. In various diagnoses carried out in the Ecuadorian context [5], the need to update and train basic education teachers on sustainability issues has been evidenced. Likewise, the National Strategy for Environmental Education for Sustainable Development [6] and the Provincial Plan for Environmental Education of Imbabura 2020-2025 [7] contemplate the importance of teacher training.

The methodology was structured in two stages: 1.- Development of the teaching training process, considering institutional needs and emerging disciplinary themes; 2.- Evaluation of the seminar.

2. Points of Results and Discussions

2.1. The seminar *“Teacher Training Workshop on topics and didactic tools for environmental education and natural sciences”*

The seminar planning was carried out jointly between 17 students of the Master's in Environmental Education and two teachers responsible for the project, determining the learning objectives, the methodology, the resources, the time and the place. At the same time, the call to the participating teachers was carried out, by the Local Consultive Council for Environmental Education of Imbabura. All the activities were carried out in the spaces of the Graduate Faculty of the University.

The workshop included conferences on topics such as Education for the SDGs, Education for the conservation of biodiversity and climate change, Education for responsible consumption and Horizontal Education. For their part, postgraduate students developed six workshops on didactic strategies such as comic strips, simulation, wall newspaper, creation of terrariums, role playing and gamification activities. These strategies made it possible to

address issues related to the environment and sustainability, such as climate change, the knowledge and the importance of local biodiversity, solid waste management, and responsible consumption, giving teachers the opportunity to actively participate and exchange experiences (Table 1).

Table 1. Strategies developed in the workshop

Strategy	Objective	Contents addressed
a. Comic strips	Promote the use of comics as a didactic strategy for teaching environmental education aimed at responsible consumption of water and electricity.	Responsible consumption of water and electricity.
b. Simulation	Implement a simulation on shopping in the supermarket in order to clarify purchasing criteria and define needs	Sustainable consumption of goods and services
c. Wall newspaper	Prepare wall newspaper as a didactic strategy to promote responsible management of solid waste	Management of solid waste in educational institutions.
d. Creation of terrariums	Develop terrariums as teaching resources that promote the understanding of nature as a system	Structure and function of an ecosystem
e. Role-playing	Value role-playing as a strategy that allows reflection and planning actions for local wetlands conservation	Contamination of the city's water bodies (Yahuarcocha Lake)
f. Asking game	Develop games to facilitate recognizing the local biodiversity.	Representative flora and fauna of the province

112 teachers from various institutions and educational levels participated in the workshop. The first strategy presented was "*The comic as a didactic strategy to raise awareness about the responsible consumption of water and electricity*" (Figure 1), which was developed in three phases: the first consisted of presenting the didactic strategy and its application in raising awareness towards responsible consumption of water and electricity. Phase 2 consisted of the application of the didactic strategy, where the structure and foundation regarding the consumption of water and electricity were made known to the teachers; The presentation of a comic model for education was carried out and a practical exercise was carried out with the teachers for the development of comic texts and dialogues. In phase 3, the teachers expressed the knowledge acquired through the QUIZZIZ application. As an incentive for participation, native plants and cloth bags were delivered to encourage reforestation and a reduction in the use of plastic.



Figure 1. Participation of teachers in the preparation of comics

The second workshop was a simulation about purchasing practices in a supermarket. This activity began with the presentation of two billboards with various packages of products that are purchased in the supermarket (Figure 2). With the participation of several teachers, they were told to select the 10 most necessary products. In a second phase of the activity, the participants had to explain the acquisition criteria for each product, what basic need it responded to and the reasons for selecting one brand or another. For each product, the impacts on society, nature and health were analyzed.



Figure 2. Teachers participating in simulation on responsible consumption

The next strategy was the wall newspaper, which was used to address the comprehensive management of solid waste in educational institutions and its relationship with the Sustainable Development Goals (especially 12 and 13) (Figure 2). It began with a brainstorming session on the theme "Garbage is not part of the landscape", to then reflect on questions and puppets that allowed the environmental situation raised to be problematized. After this, the practical stage began, through the development of a 3D wall newspaper. Finally, an evaluation was applied to diagnose the knowledge acquired by teachers, with questions such as: What impact does garbage have on water, soil, air, flora and fauna? And what strategy do you consider to be the most adequate to apply in your institution?



Figure 3. Resources prepared to present the wall newspaper strategy

The fourth workshop was the creation of terrariums as a strategy for environmental education and natural sciences (Figure 3), which was organized in two phases. In the first, teachers were introduced to the structure and rationale for the use of terrariums for environmental education and natural sciences. A terrarium model for teaching was presented and several terrariums were made with the teachers for the development of a lesson plan using a terrarium as an educational resource. In phase 3, they exhibited the terrariums made by the teachers participating in the workshop, and shared their perceptions about the didactic value of these resources and their educational potential for teaching environmental issues, especially local biodiversity.



Figure 4. Creation of terrariums with the participating teachers

The fifth strategy was a role play aimed to think the perspectives of the different social actors and to propose solutions to the environmental problems of Lake Yahuarcocha, the most important body of water in the city. First, a socialized discussion

was held on the environmental problems of the wetland (evidencing causes and consequences) and the roles that the teachers would play were assigned (fishermen, restaurant owners, community residents, local authorities, community leaders, tourists, among others). The role-play was carried out, asking each group to present their vision of the problem, appealing to dramatization to present the vision of the assigned role (Figure 4).



Figure 5. Participation of teachers in the role playing

The last workshop was a trivia game. The main objective of this strategy was to promote the recognition of representative flora and fauna of the Imbabura Province, while promoting teamwork and decision-making through healthy competition. For this, the Mentimeter application was used, in which questions related to the biodiversity of the province were answered. The beginning was given by presenting the rules of the game to the attendees. After each question session, a feedback of the contents was carried out to help in learning.

2.2. The evaluation

One month after the workshop, an evaluation of the impact generated by the workshop on teachers was applied through a survey applied electronically with Microsoft Forms platform.

The most relevant results of this evaluation are:

- 31 teachers answered the survey voluntarily (27.6%), which can be considered a representative sample of trained teachers.
- All the teachers indicated that contents and strategies addressed in the workshop are useful for their educational work.
- 90% indicated that the most relevant aspect of the workshop was the approach to teaching strategies and 10% referred to topics such as local biodiversity and responsible consumption.

On a scale from 1 to 5, the scores given to the different aspects of the workshop are:

- Quality of event activities: 4.87
- Quality of the facilities and venue of the event: 4.87
- Quality of the event agenda: 4.84
- Quality of the event's speakers (conferences): 4.87
- Quality of the speakers of the event (Workshops given by postgraduate students): 4.81

These results show a high valuation of the activities carried out by the participants.

Finally, for postgraduate students, the seminar was an opportunity to contribute to the development of environmental education at the provincial level. Likewise, it constitutes an ideal scenario for the application of the competences acquired throughout the master's program.

3. Conclusion

Projects that integrate teaching and extension offer opportunities to promote environmental knowledge and the appreciation of sustainability as a model. In the experience presented, a teacher training seminar became a setting for postgraduate students to contribute to increasing the pedagogical skills of Basic Education teachers. In this way, these community service projects become ideal strategies to transform reality and allow the University to promote sustainability in its immediate social environment.

References

- [1] Arocena, R. & Sutz, J. (2016). *Universidades para el desarrollo*. UNESCO. Available online at <https://unesdoc.unesco.org/ark:/48223/pf0000246445>, accessed on 20 April 2023
- [2] Universidad Técnica del Norte (2016). *Modelo educativo*. Ibarra, Autor
- [3] Moncada, J. (Ed.) (2021). *Hacia una Universidad Sustentable. Construcción de un modelo para la UTN y experiencias latinoamericanas*. Available online at <https://issuu.com/utnuniversity/docs/e-book-hacia-una-universidad-sustentable>
- [4] , accessed on 20 April 2023
- [5] Moncada, J., Paredes, J. y Aranguren, J. (2022). Aportes a la educación ambiental para la sustentabilidad desde la Facultad de Posgrado de la Universidad Técnica del Norte, Ecuador. *Revista Eletrônica do Mestrado em Educação Ambiental*, 39 (2), 159-175. <https://doi.org/10.14295/remea.v39i2.13956>.
- [6] Mina, M.R. (2018). *Modelo de capacitación docente, dirigido a promover el abordaje de la educación para el consumo en la Educación General Básica ecuatoriana*. (Doctoral thesis). Universidad Católica Andrés Bello, Caracas. Available online at <http://biblioteca2.ucab.edu.ve/anexos/biblioteca/marc/texto/AAT5828.pdf>
- [7] Ministerio del Ambiente (2018). *Estrategia Nacional de Educación Ambiental para el Desarrollo Sostenible 2017-2030*. Available online at <https://www.ambiente.gob.ec/wp-content/uploads/downloads/2018/07/ENEA-ESTRATEGIA.pdf>
- [8] Gobierno Autónomo Descentralizado Provincial de Imbabura (2020). *Plan Provincial de Educación Ambiental de Imbabura 2020-2025*. Available online at [https://www.imbabura.gob.ec/phocadownload/K-Planes-programas/Planes2020/plan provincial de educaci%C3%B3n ambiental de imbabura.pdf](https://www.imbabura.gob.ec/phocadownload/K-Planes-programas/Planes2020/plan%20provincial%20de%20educaci%C3%B3n%20ambiental%20de%20imbabura.pdf)

