Teaching Competencies in Education for Sustainable Development: A Study from Action Research

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Abstract

The objective of the research was to improve in a participatory way the teaching competencies in education for sustainable development (ESD) in an educational institution in Ecuador. The study was conducted based on the Rounder Sense of Purpose competency framework (Vare, 2018). Under the qualitative approach and under action research, we worked with eleven participants, with whom interviews and focus groups were conducted. As a consequence, in the diagnostic phase, the management, competencies and teaching practices in ESD were analyzed. From there, eight competencies were selected for the implementation of a training program. The program was executed and finally the evaluation was carried out, reflecting on the entire process. The results made it possible to determine the usefulness of the teaching skills training program for ESD, which stands out because it was well received in the educational community, and can also be replicated by other educational institutions.

Introduction

The environmental problem, global warming, the food crisis, the polarization of wealth and its consequences are factors that generate industrial overproduction to satisfy human needs; This has become a very serious social problem, which requires state, regional and local intervention to help provide sustainable and sustainable solutions that allow us to stop the violent deterioration of our common home. Sustainable development is also part

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of the goals proposed in the 17 SDGs of the 2030 Agenda, which calls on member countries to end poverty, protect the planet and improve the lives and prospects of people around the world. SDG No. 4 focuses on education, among other things, the development of life skills, elimination of disparities, mathematical literacy, promotion of sustainable development, etc. (Orr, 2011) (UN, 2015b) (Aznar-Minguer, 2010; de la Rosa et al., 2019; Mckeown, 2021)

In this context, the role of education in achieving ODS2030 has given rise to a theoretical framework of competencies called Education for Sustainable Development (ESD), which is based on achieving teaching and learning towards a present and future of caring for the environment, the construction of equality and free access to basic services fundamental to a full life. In order to achieve ESD, priority must be given to the training of competent teachers in order to be able to transmit the change from school to a better coexistence with the planet. The development of teaching competencies can achieve an articulation with the principles and dimensions of sustainable development, in the use of the tool education for sustainable development ESD in school curricula, where existing teaching competency frameworks can be recreated. However, despite the fact that the education system and its actors develop these competency frameworks, there is very little training on offer, especially for the school levels of initial, basic and baccalaureate education, from relevant bodies, as is the case of the Ministry of Education of Ecuador. (Corres et al., 2020) (ERASMUS+, 2018; Rieckmann, 2019; Roegiers, 2016; Scherak & Rieckmann, 2020) (ERASMUS+, 2018; Lozano et al., 2019; Lozano & Barreiro-Gen, 2021) (Huerta, 2008; UNESCO, 2013, 2017, 2020) (Murga, 2015; Rieckmann, 2020; Scherak & Rieckmann, 2020; UNESCO, 2019)

This is how ESD in teachers becomes key to meeting the ODS2030. There are competencies ranging from those indicated by UNESCO (2019) to those proposed by teams of researchers who, when evaluating them, have made it possible to identify biased and non-holistic actions. For example, the European Economic Community is working on the implementation of ESD with a pedagogical approach, which allows initial and in-service training centres to train teachers in educational skills for sustainable development, prioritising teaching strategies that allow the development of solutions for environmental and social care towards a better habitability of the earth. . (Pache & Lausselet, 2022; Vare et al., 2022; Zürich et al., 2008; Zwolińska et al., 2022) (Cebrián et al., 2020, 2021; Rieckmann, 2019) (Corres et al., 2020; Huerta, 2008; Morales Castillo & Ruiz, 2015; Rieckmann, 2020)

For the study, the Humanist Theory was taken as supported, the theory of multiple intelligences that considers the naturalistic or ecological intelligence that encompasses the understanding of our natural environment, as an interaction not only with human beings, but also with other beings with whom a balance of habitability must be sought, the Constructivist Theory, the approaches to teacher competencies and Education for Sustainable Development, which allowed for an analysis of the causalities of teacher competencies and education for sustainable development. (Maslow, 1954; Picheré, 2016) (Gardner, 2011) (Piaget & Garcia , 1973; Roses & Sebastian , 2001) (Denyer, M. Furnémont & Poulain, 2007; Perrenoud, 2004; Rieckmann, 2019; Schank & Rieckmann, 2019; Vare, 2018; Vare et al., 2020) (Glaser, 2004; Zürich et al., 2008)

The training program has considered the teaching competency framework A Rounder Sense of Purpose RSP. It comprises 12 RSP teaching competencies; giving rise to a commitment to transversal – curricular work, inside and outside the classroom;).

Therefore, the main objective of the study was to carry out a participatory process of teacher training in education for sustainable development. To this end, we sought to collect information related to education for sustainable development; conducting a participatory assessment of education for sustainable development; Implement a teacher

training program in education for sustainable development and reflect on the process of implementation of the teacher training program in education for sustainable development.

Methodology

The study was developed from a qualitative approach, through action research considering its four phases: Planning, Information Interpretation, Development and Evaluation, adapted from . Mertler (2017)
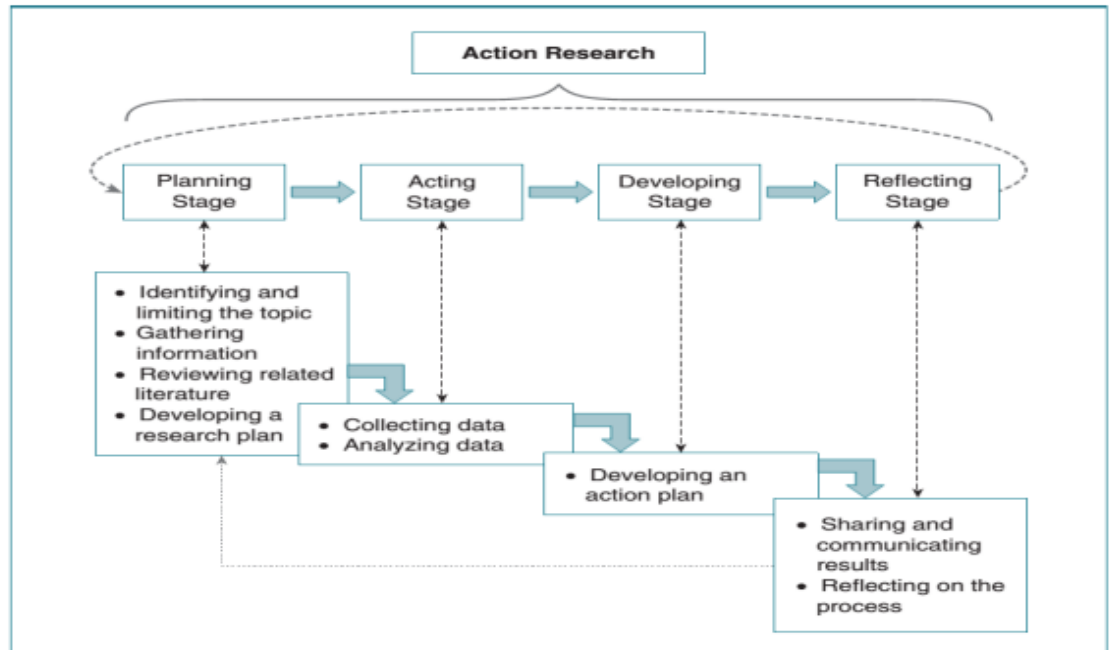
Fuente: (Mertler, 2017. P. 37).

The setting of the study was a private educational institution in the rural area of the province of Chimborazo - Ecuador. Nine teachers from the unified general baccalaureate were selected as a sample, who were interviewed and invited to attend a Focus Group for a participatory analysis.

Phase 01. Planning: At this stage I identify and delimit the topic. The literature was reviewed and an online questionnaire with six open questions was applied, then six-question interviews were conducted on the management, competencies and practices adopted in the educational institution on education for sustainable development, which served as the basis for the analysis and then the proposal of the action plan.

Phase 02. Analysis of the information: A focus group was applied, where the participants were able to socialize the information collected and express their intentions to care for the environment, with social justice and equality for all, arriving with a brainstorm to determine the eight competencies (from the initial twelve of the RSP competency framework), which were known in more depth, In its definition, activities that are based on the expected learning of the students and the teacher's own components.

With the participation of all, a diagnosis was drawn up that then gave way to the need to develop a training program in a blended way with the support of a virtual LMS platform Moodle 4.3.

Phase 03. Development: The training program "Teaching Competencies for Sustainable Development" was designed and implemented. The proposal was agreed upon based on the reflection and work of the teaching team, carried out in phase 1 and phase 2.

Phase 4. Evaluation: A focus group was held where questions were asked about learning achievements, work methodology, technological resources and social mobilization that has allowed the development of the teaching competencies chosen for the achievement of learning towards education for sustainable development.

All the information obtained in the four phases has been analysed with the program ATLAS.ti 23.3.4.28863, student license.

Results

Phase 01. Diagnosis

Regarding the online survey, it was obtained that Education for Sustainable Development refers to respecting and recognizing the knowledge and traditions of all those who make up the educational community.

In Ecuador, this education is supported by the regulations of the Management Guidelines and the LOEI, so it is important to implement it to guarantee inclusive, equitable and quality education.

Regarding the competencies they know, in the framework of education for sustainability, the institutions that implement it have obtained results such as an improvement in students' understanding and greater inclusion.

And, with respect to the practices that are already being implemented, it has been found that methodological strategies such as cooperative learning and problem solving have been used. Teaching competencies that have helped develop Education for Sustainable Development include teamwork, fostering inclusion, and using new ones.

Phase 02. Interpretation

Regarding the competencies that would be the highest priority to be implemented, it has been determined that of the 12 competencies of the RSP, a training program of 08 competencies could be carried out: Systems, transdisciplinarity, critiques and futures, creativity, participation, values and action, which were implemented in phase three.

Phase 03. Development

In response to the indications of the participants, the Framework of 12 RSP Teaching Competencies was presented, of which they chose, in a brainstorm, eight to work from the virtual platform eZona Sostenible. The action plan focused on the following learning topics: 1. Introduction to the SDGs and ESD. It was intended that participants clearly identify the 2030 SDGs and Education for Sustainable Development, within the achievement of Sustainable Development Goal 4, Quality of Education. 2. A Rounder Sense of Purpose. The purpose of the topic was to learn about a Framework of Teaching Competencies for Education for Sustainable Development, RSP in which some universities of the European Economic Community participate. 3. Teaching Competencies in Action (Part 1). The aim of this theme was to present, learn about and reflect on four teaching competencies for education for sustainable development, which have been selected from the original PSN: Systems, transdisciplinarity, critique and futures. 4. Teaching Competencies in Action (Part 2). The aim of this theme was to present, learn and reflect on four teaching competencies chosen for its development: Creativity, participation, values and action. 5. Necessary reflections. The objective of this topic was to reflect on the training process, its benefits, its difficulties and potentialities inside and outside the classroom.

These competencies were developed in six virtual work sessions and two face-to-face meetings, with the support of a Moodle 4.3 platform, contracted for the purpose.

Phase 04. Evaluation

For phase 4, a focus group was held where questions were asked about learning achievements, work methodology, technological resources and social mobilization that will allow them to develop the teaching competencies chosen for the achievement of learning towards education for sustainable development.

Discussion

Education for sustainable development promotes principles and values to achieve sustainable development, where present needs are met without compromising future ones, taking into account economic, social and environmental aspects. ESD is an educational approach that prepares people to face sustainable development and its uncertainties and provide knowledge, skills and abilities that guide them towards a sustainable future. (UNESCO, 2020) (Brundtland et al., 1987)

For the diagnosis, this research determined three categories of work: Education Management ESD, Teaching Competencies for ESD, and Teaching Practices for ESD Achievement.

Within Category 1. It has been found that there are normative frameworks in Ecuador that raise the urgency of working with the SDGs, which is related to the international treaties to which the country is a party. Participants understand this, but they do not precisely determine the regulatory frameworks in which ESD is present; they cite the Constitutional, the LOEI and environmental laws. Therefore, the perception of the participants in this regard is ambiguous. Therefore, the gap in teachers' knowledge of how to work with ESD starts from their lack of normative knowledge and then in their pedagogical practices. (Executive Decree No. 371, 2018)   (UN, 2000, 2015b, 2015a) (Organic Law Reforming the LOEI, 2021) (Leguía, 2019)

P 3: The regulations of the Ministry of the Environment and the TINI project

In category 2 Teaching Competencies for Education for ESD: Teaching Competencies for Holistic Thinking, participants decided to develop Systems, Transdisciplinarity and Critique. (ERASMUS+, 2018; Vare, 2018)

Transdisciplinarity: in order to work with that, the person now helps students to act collaboratively both inside and outside their discipline, i.e. the educator encourages creative thinking and flexibility in their students.

Within the Teaching Competencies for the Vision of Change, Futures and Creativity were discussed; and, in teaching competencies for transformative action, they adopted Participation, Values and Action.

P8. In education, this involves teachers helping students work collaboratively both within and outside their discipline, fostering creativity, critical thinking, responsibility, and decision-making.

In this aspect, the participants adopted their own competency framework that could partly affect the future results of the adoption of the RSP framework, since it does not take into account, for example, Empathy as a substantial part of the work with students and the educational community in general as part of interpersonal intelligence. although participants believe that Participation and Values should focus on the task of teaching. (Vare, 2018)   (Gardner, 2011)

GF. Summary 10 Participation and Values: Awareness will be raised about how beliefs and values underpin practical actions. Educational competencies will be applied that encourage the participation of the entire educational community.

It can be stated that the development of values in the Competency Frameworks is assumed as part of social competence and therefore of good behavior inside and outside the classroom. (ERASMUS+, 2018; UNESCO, 2019; Vare, 2018)

GF: Participant 11. "It is necessary to work with values in order to develop a stable and productive work environment..."

Category 3. Teaching practices implemented for education for sustainability.

Regarding learning achievements with ESD, participants argued that creative activities should be implemented in solving problems in sustainability, at the local and global levels, this is consistent with the statement that problems should be solved in different situations and contexts. In this regard, it indicates that in several interventions of programs with ESD, they give positive results in the educational institutions intervened, which contrasts in those that are not intervened. In Ecuador, the Curriculum Framework by Learning Competencies is very new and teachers have not been taken into account to socialize strategies in its implementation. (Vare et al., 2020)   (O'Flaherty et al., 2017) (MINEDUC, 2023b)

Regarding methodological strategies, participants indicated that they should focus on active, interdisciplinary learning with clear concepts of sustainable development. The Ministry of Education of Ecuador is trying to implement them with the guidelines for curricular insertion of sustainable development, as a transversal axis that coincides with the launch of the curricular framework of competences for learning. By implementing a training program of teaching competencies for ESD, from action research, it was intended that the beneficiary educational institution can work hand in hand with all educational actors, thus the use of the RSP Teaching Competency Framework developed actions from the learning of the students and the necessary components to be taken into account in each competency chosen for the purpose. There are many frameworks of teaching competencies implemented of which he mentions its benefits, but he does not take into account the PSN within his study, which implies that more evaluative actions of this strategy towards ESD are required, which allow it to be visualized in its positive and negative aspects. (MINEDUC, 2023a)   (MINEDUC, 2023b)   (Rieckmann, 2020; Vare, 2018; Vare et al., 2019)   O'flaherty et al.   (2017)

In reference to the use of technological resources, they indicate that collaborative work in digital environments, which puts into force the intentions of UNESCO (2019) when designing the framework of teachers' competences in ICT. The PSN uses technology to carry out actions in favor of SD and ESD through Innovation and Creativity. In theory, any competency framework should use technological resources to raise awareness of environmental care, improve social relations with equity and justice, but this depends on places and circumstances. For example, in the educational institution where the training program was applied, there are favorable conditions to implement a framework of teaching competencies due to its particular secular support and local and provincial recognition, but it is not common in all the institutions in its environment, as is the case in Latin America, where this moves according to the governments of the day and not to the existing state policies. Which is a limitation. (UNESCO, 2017, 2020, 2022)

In terms of social mobilization actions, the fact of thinking about collaborative actions from the home, the educational institution and the local community is a decisive factor for the implementation of the PSN or another model of teaching competencies towards ESD. Caring for the environment requires social actors to be directly involved in the change, which is also part of the achievement of SDG 4 Quality of Education and ODS2030. Social mobilization can and must therefore be born from education, from the

school and its educational actors, which is an imperative in times of current crisis. (UNESCO, 2017)   (García et al., 2017; UN, 2015a, 2015b, 2018; UNESCO, 2017) (UNESCO, 2020)

Conclusions

The implementation of a training program of teaching competencies for education for sustainable development is an effective practice that achieved in the beneficiary participants a direct involvement with the solution of socio-environmental problems and their care, which was manifested in the four phases of application of the action research: Diagnosis, interpretation, Development & Evaluation

The Teaching Competency Framework, A Rounder Sense of Purpose RSP, is feasible to implement, as it is very clear and exemplifies the desired learning of students and the necessary components of teachers for the achievement of competencies, in this case eight of the initial twelve.

The process followed by action research is optimal for participatively implementing innovations in the school; It is also motivating to propose new studies.

The activities that can be carried out for the development of each component are based on the actions that are framed in the classroom context and the environment, as a means of raising awareness and social mobilization towards ESD and SD.

The difficulties encountered in the four phases of the research were the time of the teachers and difficulties of basic services, typical of developing countries such as Ecuador.

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