


# CONTINUED TEACHER TRAINING USING ECO-FORMATIVE CREATIVE PROJECTS IN THE INTERFACE BETWEEN LITERACY THE SUSTAINABLE DEVELOPMENT GOALS (SDG)

FORMAÇÃO CONTINUADA COM PROJETOS CRIATIVOS ECOFORMADORES NA INTERFACE ENTRE ALFABETIZAÇÃO E OBJETIVOS DE DESENVOLVIMENTO SUSTENTÁVEL (ODS)

FORMACIÓN CONTINUADA CON PROYECTOS CRIATIVOS ECO-FORMATIVOS EN LA INTERFAZ ENTRE ALFABETIZACIÓN Y LOS OBJETIVOS DE DESARROLLO SOSTENIBLE (ODS)


## Marlene Zwierewicz

PhD in Psychology from the Federal University of Santa Catarina (UFSC) and PhD in Education from the University of Jaén (UJA), Spain. Majored in Pedagogy from the State University of Santa Catarina (UDESC). Head of the Professional Graduate Program in Basic Education (PPGEB) at Universidade Alto Vale do Rio do Peixe (UNIARP). [marlene@uniarp.edu.br](mailto:marlene@uniarp.edu.br)

 0000-0002-5840-1136


## Joely Leite Schaefer

M.A. in Basic Education from the Professional Graduate Program in Basic Education (PPGEB) at the Universidade Alto Vale do Rio do Peixe (UNIARP). Majored in Pedagogy from the Statel School of Philosophy, Science and Literature in União da Vitória-PR (FAFIUV). Basic Education School Manager with the State School Newtork of Santa Catarina. [joely.leite@gmail.com](mailto:joely.leite@gmail.com)

 0000-0002-8478-8362

## Farid Carmona Alvarado

Post-Doctor in Complex Thinking and Pos-Doctor in Qualitative Research. PhD in Science of Education from the University Simón Bolívar (UNISIMON). Majored in Psychology from the University Simón Bolívar (UNISIMON). Researcher Professor at the University Simón Bolívar. [farid.carmona@unisimon.edu.com](mailto:farid.carmona@unisimon.edu.com)

 0000-0002-3669-6746

Mailing address: Rua Victor Baptista Adami, 800 - Centro, Caçador - SC, 89500-199, Brazil.

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## ABSTRACT:

This study systematizes part of the results of a research-action with an emphasis on qualitative approach, conducted for the purpose of developing a transdisciplinary eco-formative proposal with literacy teachers from schools in the city of Porto União, state of Santa Catarina, by analyzing their potential to meet local demands and convergence towards the Sustainable Development Goals (SDG). Among the results, the research reiterates how important is the interface between teacher training and teaching profession in order to achieve a metamorphosis of the pedagogical practice and the potential of ECP methodology to bring curricular contents closer to local and global demands.

**KEYWORDS:** Basic Education; Teacher Training; Transdisciplinarity; Eco-formation; Sustainable Development Goals.

## Introduction

In a context of sudden changes, felt more intensively since 2020, when the covid-19 pandemic hit the planet, there has been an increased need to overcome the traditional educational thinking – fragmented and mechanistic -, arising from the traditional paradigm still found in pedagogical practices out-of-context and worldwide disconnected. In addition, worsening education-related problems, still during the pandemic period, discrepancies in terms of opportunities for poorer students in their formation were expected due to the social inequality aggravated by the impacts of the pandemic (Berg et al., 2020).

New problems were now added to the demands already experienced before the health crisis, which demonstrated the relevance of continued training of teachers in order to achieve a transition from obsolete pedagogical practices towards pedagogical practices committed to the local and global realities. Likewise, new challenges for teaching literacy came up, showing the need to articulate the pedagogical practices to the real living conditions of the students and the issues that affect the whole planet.

In sight of this trajectory, permeated by many challenges that were worsened because of the social isolation imposed by the pandemic, it was proposed to conduct the research with fragments systematized in this paper. The research, however, was carried out in 2022, when the schools were returning to face-to-face activities, therefore in a crucial moment for an education affected by distancing and by the evils of social inequality.

The research had the purpose of developing a transdisciplinary and eco-formative proposal with literacy teachers (1st and 2nd grades), teachers of the 3rd grade and second teachers from schools pertaining to the State School System in the city of Porto União, Santa Catarina, in order to analyze its potential to meet the local demands bringing them closer to the Sustainable Development Goals (SDG) (Schaefer, 2023). In this paper, we present the results achieved in relation to the proximity of the proposal with the SDGs, as this is a fragment of the research.

As a study with intervention, based on research-action and a qualitative approach, linked to the Professional Graduate Program in Basic Education (PPGEB) from the Universidade Alto Vale do Rio do Peixe (UNIARP), Caçador, Santa Catarina, the initiative had the participation of 29 professionals, out of which 18 teachers who effectively took part in the training. Data collection included three questionnaires to survey formative demands and assess how close the formation was to its objective, three forms to follow on the training and a template to transform the formative proposal into an educational product.

Next, a theoretical framework was systematized that would underpin the formation, the methodology used for its assessment, and part of the results found. It is expected that this production may contribute to the development of formative initiatives capable of introducing metamorphoses in the pedagogical practice, especially those that enhance an education committed to life.

**Teacher training as a possibility for a metamorphosis of pedagogical practices that are out-of-context and worldwide disconnected**

With emerging educational demands, as a result of the globalization process, of the technological advancements, the increased environmental degradation and other problems such as those caused by the covid-19 pandemic, it became essential to redirect teacher training. The reason for that is, just like instruction centered around a linear paradigm does not meet the students' demands, teacher training guided by initiatives that are out-of-context and worldwide disconnected does not meet the teachers' needs, from whom competences and skills are required to tackle the current challenges.

In addition, even if the pandemic period had begun, Gatti, Barreto and André (2011) advocated for the need to reflect on continued formations, especially those with a fragmented format, based on lectures, workshops and short-term courses, whose characteristics are exclusively transmissive and reproductivist, while Behrens (2007, p. 445) argued that teacher training requires "[...] processes of continued qualification which address a critical, reflexive, and transformative view". Therefore, the concerns with teacher training are not recent, despite the problems that have aggravated education, as it became clear during the pandemic.

Among the current perspectives, André and Martins (2020, p. 194) indicate one of the major objectives of continued formation: "[...] mobilize teachers to work collectively, unleashing changes at the schools, in order to best meet the students' learning needs [...]". Pinho, Queiroz and Santos (2021) converge towards this position by assigning continued training a constantly open space for collective reflections and self-formation. For those authors, formation has to be to a "[...] an open process in an evolving spiral, founded on solidarity, on questioning, on reflecting about the actions developed" (Pinho, Queiroz and Santos, 2021, p. 163).

Close to this perspective, Nóvoa (2019), in turn, upholds a formation involving the context of teaching in order to boost joint reflection and collective work, with the participation of all professionals within the school community. For him, "[...] the metamorphosis of a school happens whenever teacher get together collectively to think about their work, to build different pedagogical practices, to respond to the challenges posed by the end of the school model [...]" (Nóvoa, 2019, p. 11) still in place.

In the same direction, Aguiar and Hobold (2015, pp. 221-222) stress the importance of teachers being able to "[...] express their formative needs [...]" and actively participate in their "[...] process of professional development [...]", by analyzing and collectively reflecting on their practices, where the school is "[...] like a privileged place of formation". Likewise, Nóvoa (2019, p. 14) argues that:

It is necessary to connect formation and profession. By doing so, we will be creating the conditions for teachers to be ready for the new times, to be able to actively participate in the metamorphosis of the school. Nobody becomes a teacher without the help of more experienced colleagues. It begins at the universities, goes on at the schools. Nobody can be a teacher, today, without the reinforcement of the collective dimensions of the profession. The future is written in the courage of the action. Thinking the right thing is taking action.

For such, Nóvoa (2019, p. 7) proposes to reconstruct the ambience where continued teacher training takes place, “[...] always guided by the idea that the place of formation is the place of the profession”. Thus, the author observes that, “Despite all difficulties and all the problems, any real change in education and in pedagogy can only come *from within* the teaching profession [...]” (Nóvoa, 2022, p. 3).

Specifically, in relation to the teachers involved in literacy teaching, formation needs to aid such professional to think their practice in a diversified fashion, considering the heterogeneity existing in the classroom, where each student has a singular way of thinking and acting. Obviously, such assignment is a great responsibility, because it has direct repercussions in the student’s formation which will be essential in the subsequent years. That is why Cagliari (2009) argues that, the more aware the teacher is of how students absorb knowledge, of their emotional state, of their way of interacting and of the nature of the linguistic reality involved, more capable the professional will be to “[...] conduct in an agreeable and productive manner the learning process, without the usual suffering” (Cagliari, 2009, p. 6).

In accord with Cagliari (2009), Barboza (2016) emphasizes the need to strengthen teacher training in the schools so that literacy teachers have the opportunity to “[...] reflect on the teaching and learning processes, to discuss their difficulties, points to overcome, mistakes and successes, in addition to sharing skills related to reading and writing and their social and cultural role in the life a child [...]” (Barboza, 2016, p. 4.138). As a result, collaborative formative involving literacy teachers in the socialization, in the discussion and in the reflection of their own pedagogical practices provide effective contributions for changes and improvements both of the teaching practices and of the students’ learning processes (Barboza, 2016).

Taking into account such reflections by the authors above mentioned, the perspectives of teacher formation systematized here show the relevance of initiatives that include pertinent knowledge in their epistemological framework, as well as transdisciplinarity and eco-formation. These references potentiate the bond between

teacher training and the demands of reality and, at the same time, they cooperate to promote pedagogical practices committed to the individual, social, and environmental needs.

Pertinent knowledge is conceived by Morin (2011) as one of the seven complex lessons required by education. Such knowledge allows to locate “[...] the information and the data in their context so that they make sense” (Morin, 2011, p. 34). In addition, it also helps comply with “[...] the need to promote a knowledge capable of understanding the global and fundamental problems in order to inscribe them the local and partial knowledge” (Morin, 2015a, p. 100).

Pertinent knowledge is a kind of knowledge produced by an open rationality which contextualizes and conceives the human and multi-dimensionality and also that of nature (Sá, 2019). By “[...] locating everything in the planetary context and complex [...]” (Morin, 2011, p. 33), pertinent knowledge demonstrates the relevance of transdisciplinarity in teacher education. The reason for that is that transdisciplinarity is actually “[...] what is simultaneously between the disciplines, *through* the different disciplines and *beyond* any discipline [...]” (Nicolescu, 2018, p. 53).

The transdisciplinary emphasis in formation enables teachers to plan their activities by linking the curricular content to demands from the context (local) and global demands (as found in the Sustainable Development Goals (SDGs) and in their respective targets). This is the linking that transdisciplinarity achieves in its purpose of contributing to “[...] comprehend the present world, for which one of the imperatives is the unity of knowledge” (Nicolescu, 2018, p. 53).

In addition to the relevance of transdisciplinarity in formations seeking to link the curricular content to the global context and demands, the possibilities for such reconnection are enhanced when they develop eco-forming pedagogical practices. That is because “[...] the grounds of eco-formation are an invitation to re-encounter and for dialogue between the natural and the cultural [...]”, so that, when the individuals re-encounter nature, they may “[...] re-encounter themselves and re-encounter the others”. Therefore, by means of eco-formation, it is proposed that “[...] the formative contact with things, with objects and with nature [...] may be formative of other connections, especially the human bonds” (Silva, 2008, p. 102).

By appreciating the interconnection between the person, society and environment as a process of permanent and inextricable interdependence, eco-formation contributes to break up fragmentation between theory and practice (Souza; Ertzogue; Zwierewicz, 2020). For the authors, such break-up is the result of an effort to

overcome the reductionist thinking and it is indispensable to tackle the current challenges, especially when one does not advocate “[...] for an illusory and redeeming hope, but for a hope that is utopic and creative, activating and regenerating, which corresponds to the moment we live in, which is the moment to take action” (Morin; Delgado, 2017, p. 10).

Continued formation in the transdisciplinary perspective that mobilized eco-forming pedagogical practices goes beyond generalist and pre-defined proposals. It is made up of dialogue, in the hologrammatic perspective and recursive emphasis and, therefore, by principles of the complex thinking, whose emphasis lies in the “[...] struggle, not against incompleteness, but against mutilation [...]” (Morin, 2019, p. 176) derived from practices that disregard complexity. It is, therefore, a way to overcome “[...] the principle of simplicity that separates what is connected (disjunction), or unifies what is diverse (reduction)” (Morin, 2015b, p. 59).

Being made up of a dialogical attitude, teacher formation allows for what Morin (2015b) defines as reconnection of ideas, even if they reject each other, overcoming the dualist perspective present in alternatives that characterize the formations traditionally provided. Dialogical attitude is essential to transpose the evils of the educational paradigm responsible for a formation through which one “[...] sees the integral, or the multiple, but cannot see that the integral can be multiple at the same time [...]” (Morin, 2015b, p. 59).

In the same direction, the hologrammatic perspective of formation is “[...] fundamental to analyze pertinent knowledge which lies in the parts (context) and in the whole (global), but also in the relationship between the parts and the whole” (Kosteski, 2021, p. 95). In turn, the recursive emphasis stimulates, during the formation, “[...] what is produced looks back to what produces it in a self-constitutive, self-organizing, and self-producing cycle in itself” (Morin, 2015b, p. 74).

That is why, by proposing the formative intervention, this research prioritized teacher training rooted in the principles of the complex thinking (dialogic, hologrammatic, and recursive), appreciative of listening, committed to both the demands of the context and to the planetary emergencies, aligned with a perspective of spiraled formation-action.

To streamline this perspective, the choice was to use the Program for Formation-Action in Creative Schools as the ground for the intervention. This program emerged from “[...] the dialogues between Torre and Zwierewicz about the concept of Creative Schools [...]” and after both authors had created the ECP methodology (Zwierewicz,

2017). The initial proposal was devised by the second author of this article to be conducted in a formative experience involving managers and teachers of the Local School Network of Gravatal, Santa Catarina (Zwierewicz et al., 2017). From its inception until 2017, according to Zwierewicz et al. (2017), eight cities in the south of Santa Catarina stimulated the participation of managers and teachers in the program.

From 2018 on, the Program on Formation-Action in Creative Schools became an object of study in researches carried out at PPGEB of UNIARP, including those by Zanol (2021) and Suchara (2023). Having these researches and extension activities supported by permanent teachers at PPGEB of UNIARP, the program then started to serve schools from other areas of the state and also from the state of Paraná, which showed its consolidation and the capillarity of benefits that reach out “[...] managers and teachers, students, and the communities involved in the activities performed through the formation” (Zwierewicz, 2023, p. 7).

For its development, the Program on Formation-Action in Creative Schools is organized in five steps, with the purpose of enhancing the link with local and global demands, further theoretical knowledge, plan projects on a collaborative basis and implement them at the schools by systematically appreciating the advancements by means of actions that improve listening to and sharing among teachers in the very formative meetings and between teachers and members of the internal and external school communities while the activities are in progress. Therefore, it is an initiative that intends to overcome the fragmentation between theory and practice, pointed out by Souza, Ertzogue and Zwierewicz (2020), maximized due to its articulation with demands from the teachers themselves and their contexts of work and by valuing the collaborative work, which turns the place of the profession into the place of formation, as advocates Nóvoa (2019).

In all editions of the Program on Formation-Action in Creative Schools, the ECP methodology was used. Created by Torre and Zwierewicz (2009, p. 155), PCEs represent “[...] a teaching and learning framework based on the autonomy, on the transformation, on the collaboration and on the search for the full development of a person”. Continued formation based on this methodology allows for a pedagogical practice that is contextualized, worldwide connected and which enables teachers to experience, during the formative meetings, a process similar to what they will be doing in the classroom, bringing theory and practice together.

For such, the structure of the ECP methodology has ten conceptual organizers, systematized in a didactic sequence whose opening step lies in the epitome and its

closing lies in the pollination (Zwierewicz, 2017). "This structure allows for a pertinent planning because it is directly associated with a teaching perspective that is hologrammatic, spiraled and recursive, whose starting point is grounded on life, going back to it in all moments of its development [...]" (Zwierewicz, 2023, p. 15).

By planning the activities of each ECP along the development of the Program on Formation-Action in Creative Schools, linking curricular contents to local demands and global emergencies is stimulated. As a result, changes are observed in the pedagogical practice and in the space of the schools due to the emphasis on research and co-creation of solutions to real problems, such as those contained in the SDGs and their targets.

In this research, the Program on Formation-Action in Creative Schools received, as supplement, the subtitle of "teaching literacy committed to local demands and bringing them closer to SDGs" focusing on SDG 4 (Education with quality, inclusiveness, and equity). While in progress, four PCEs were addressed, one for each of the schools participating in the formation. These projects were preliminarily designed by the participating teachers and were completed with the aid of students from the four schools and of other members of both the internal and external communities, indicating the dialogical perspective entailed in its planning.

It must be also highlighted that, while ECP were being devised, specific SDGs were selected due to their adhesion to the particularities of the projects, as can be seen in Table 1, presented below. The reason for this selection was the need to bring planning closer to the context, without disregarding global demands in order to value pertinent knowledge.

### **Methodological procedures**

The intent of identifying demands from the participants in the research and, based on the results, design, develop, and assess a collaborative formative proposition, with potential to meet local demands and bring them closer to the SDGs resulted in prioritizing the research-action approach. Thiollent (2000, p. 14) insists that research-action is, necessarily, "[...] done in strict association with an action or with the resolution of a collective problem in which researchers and participants who represent the situation or the problem are involved in a cooperative or participative fashion [...]"

A qualitative approach was the priority since it allows to comprehend particularities by involving "[...] a deeper space of the relationships, of the processes



and of the phenomena which cannot be reduced to the operationalization of variables” (Minayo, 2010, p. 23), as it was initially intended in this research.

In the first phase of the project, which was collecting responses to the questionnaire on the teachers’ demands and potentials, 26 professionals participated. In the second phase, out of the 26 respondents, 18 teachers took part in the development of the formative proposal and two of them, together with two former students of PPGEB-UNIARP and one representative of 26th CRE-Canoinhas, Santa Catarina, also assessed the educational product together with the formative proposal and the four PCEs planned e implemented during the formation. Therefore, in whole, the research included 29 participants, but the results presented as follows are the outcome of 5 participating professionals.

Data collection was carried out in two steps. The first step – which occurred before the formative proposal was designed and implemented – included the following research instruments: a questionnaire to detect teachers’ demands and potentials; a form to record contributions from related researches relevant to the formative proposal; a form to organize the structure of the formative proposal in the manner of the Program on Formation-Action in Creative Schools; and a form to choose the SDGs considered indispensable for the full formation of students while learning literacy.

The second stage was carried out at the end of formative proposal and included the use of the following research instruments: a questionnaire to analyze the potential of the formation program to meet the participants’ demands; a questionnaire for the group of assessors to analyze how close the formative proposal and PCEs conducted along the meetings were to SDGs selected by the teachers; and a template of PPGEB/UNIARP to turn the formative proposal into an educational program.

The analysis of the collected data was conducted using software MAXQDA. This software is a resource with extensive possibilities for qualitative research as it allows for the treatment of several types of sources such as texts, audios, images, and videos.

In order to enforce the ethical principles while developing this study, the research project was previously submitted to UNIARP’s Ethics Committee by registering and submitting the project and related documents in *Plataforma Brasil*; it was approved under Report No. 5.497.781. To ensure compliance with the research ethical precepts, data collection included the following documents: Free Inform Consent Form (TCLE) for those of legal age, Form for the Use Image, and Statement by the Co-Participating Institutions. In addition, participants were given a code to differentiate their contributions without the need to reveal their identity, as for example codes A1

through A5 assigned to the five participants who assess how close the formative proposal and the PCEs were to the SDGs.

## Results and discussion

Before conducting the “Program on Formation-Action in Creative Schools: literacy committed to local demands and their proximity to SDGs”, the research included: to collect data regarding the teachers’ demands and potentials; to survey the contributions from related researches in order to prepare the formative proposal; to select the SDGs considered indispensable for the full formation of students while learning literacy and their inclusion in the four projects planned and conducted by teachers during their participation in the formation; to analyze the potential of the formation program to meet the participants’ demands; and to analyze how close the formative proposal and PCEs were to the SDGs selected by the teachers, among other specificities. In this paper, priority is given to the results associated with how close the formative proposal is to SDG 4 (Education with quality, inclusiveness, and equity) and the PCEs to the SDGs selected by the very research participants with the aid of members of the internal and external communities from the professional schools.

While selecting the SDGs, the teams in the four participating schools chose the ones whose focus was closer to the ECP proposed for each institution. Table 1 contains the titles of each ECP, the schools in charge of it and the SDGs selected.

**Table 01** - SDGs selected to meet each ECP

ECP Title	School	SDGs selected
Eco-Formative Creative Scenario: from revitalizing the school grove to the full development of students	EEB Nilo Peçanha	SDG 3 – Health life and wellbeing for all SDG 4 – Education with quality, inclusiveness, and equity SDG 12 – Sustainable standards of consumption and production SDG 15 – Sustainable use of terrestrial ecosystems
Eco-Formative Creative Project: school ambience to bring knowledge and benefit for the health of students by implementing a garden of medicinal herbs	EEB Coronel Cid Gonzaga	SDG 2 – Zero hunger and sustainable agriculture SDG 3 – Health and wellbeing SDG 12 – Responsible consumption and production SDG 15 – Terrestrial life
Eco-Formative Creative Project School Garden: sowing health	EEB Professor Clementino Britto	SDG 2 – Zero hunger and sustainable agriculture SDG 3 – Health and wellbeing SDG 11 – Sustainable cities and communities SDG 12 – Responsible consumption and production

Eco-Formative Creative Project: recycling for a sustainable future	EEB Antonio Gonzaga	SDG 15 – Terrestrial life SDG 11 – Sustainable cities and communities SDG 12 – Responsible consumption and production SDG 13 – Action against the global climate change
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Source: adapted from Schaefer (2023).

The reason to choose the SDGs selected by teachers to make up the PCEs proposed in this research was that they add specificities involving the commitment to good living with oneself, with the others and with the environment, that is, the planning was rooted in a transdisciplinary eco-formative education that values “[...] a type of thinking that does not separate but rather instead, which seeks the relations existing among the several aspects of life [...]” (Petraglia, 2013, p. 18).

Thus, the PCEs go far beyond the commitment to absorbing curricular contents by linking them to current demands of the local and global realities. In this case, they attempt to enhance “[...] a teaching and learning framework based on autonomy, on transformation, on cooperation, and on the search for full development [...]” (Zwierewicz; Torre, 2009, p. 162).

At the last stage of the research, part of participants (defined as assessor) reviewed the educational product devised by the formative proposal and by the four PCEs prepared and conducted along the formation, as reported above. The commitment undertaken in this analysis was to assess how close the formative proposal was to SDG 4 (Education with quality, inclusiveness and equity) and how close the PCEs developed along the meetings was to each of the SDGs selected, as indicated in Table 1, by utilizing a questionnaire prepared and validated to meet such purpose.

The results confirmed that the formative proposal got close to SDG 4 as it was found a commitment with the aspects of inclusiveness, equity and quality of education. In the analyses, A4 highlighted the commitment to provide literacy with the three aspects contained in SDG 4, ensuring that while preparing the ECP *“[...] the interests and particularities of the students in each school would be met [...]”*, and also stimulating its *“[...] articulation with the various curricular components and with the global reality [...]”*; at the same time they should boost reflections on the singularities of the schools and the choice of topics for the ECP in engaging the local reality. In this case, the transdisciplinary proposal allowed all students and their families to participate in an inclusive perspective, since different strategies and resources were utilized to

value diversity, encourage protagonism and “[...] *foster the construction of knowledge taking the local demands into consideration*” (A2).

Therefore, welcoming different needs and the openness for discussion, as participants reported, helps strengthen teaching literacy in a way that is inclusive, equitable and with quality, as advocated by the assessors. This process converges towards Barboza (2016) who upholds the need to enhance teacher formations as spaces that allow literacy teachers to reflect on teaching and learning and create alternatives to overcome the challenges found while the activities are in progress. Such possibilities, Zwierewicz and Pantoja (2004) argue, contribute for an education based on and towards diversity, which is fundamental to overcome a paradigmatic perspective rooted in competition and the consequent exclusion of those who do not adapt to a competitive and individualistic system (Zwierewicz et al., 2016).

Analyzing the PCEs on an individual basis, participants noted the link between each project and the SDGs mentioned in Table 1. Even though the assessors had found adherence to the PCEs in each of the SDGs selected, next a tapestry of the results related SDGs 2, 3, 4, 11, and 12 was systematized to make it possible associate the study of curricular contents to the global demands, without disregarding specific demands of the contexts.

- **SDG 2 – Zero hunger and sustainable agriculture:** it was associated with “Eco-Formative Create Project: school ambience bringing knowledge and benefits for the health of students by implementing a garden of medicinal plants” and with “Eco-Formative Creative Project School Vegetable Garden: sowing health”. The assessors observed whether the activities planned and conducted in both proposals were actually committed to stimulating reflection on food safety, encourage healthy food and nutritional culture based on sustainability.

All reports by the assessors were affirmative and suggested that, by allowing students to experience the growing, harvest, and consumption of medicinal herbs and vegetables, associating them with activities related to curricular contents, this has help students to feel they were part of a pertinent process of literacy. The reason for that, in addition to the link with global demands, is that the PCEs brought together what had been dealt with in the curricular content under the students’ real conditions, mobilizing a contextualized pedagogical practice; this was essential to boost habits of healthy and sustainable nutrition.

For such, it was paramount to allow students to reach an in-depth knowledge of “[...] *the process of setting up and maintaining a vegetable garden, and also to*

*encourage the consumption of organic products and appreciate food items found in our own area” (A3). In addition, the PCEs developed “[...] managed to critically integrate this topic into planning and implementing the projects, taking into account the singularities of each school ambience they were part of” (A4).*

The reports by those assessing the activities demonstrate the commitment of PCEs towards eco-formative as they start their actions considering the reality of students but going beyond this starting point. This process stimulates a kind of education “[...] based on life and oriented towards life, utilizing real problems which prioritize the development of a consciousness of personal, social, and planetary harmonization” (Zwierewicz, 2011, p. 102).

In addition, these initiatives converge towards the perspective advocated by Novoa (2022), that is, real changes in education from teachers. That is why he argues that the place of formation lies in the profession (Nóvoa, 2019).

- **SDG 3 – Health and well-being:** it was linked to ECP “Eco-Formative Creative Scenario: from revitalizing the school grove to full development of students”, to “Eco-Formative Creative Project: school ambience bringing knowledge and benefits to the students’ health by implementing a garden of medicinal plants” and to “Eco-Formative Creative Project School Vegetable Garden: sowing health”. The assessors observed whether the initiatives had boosted practices that contributed to enhance conditions to improve the quality of health in their multiple – social, mental, and physical - aspects and raise awareness to change behavior in order to prevent diseases.

Adherence of the three PCEs to SDG 3 was confirmed by the assessors and their responses were followed by reasons and examples that reaffirm their positions. i) *“When the projects took into account the singularities within the school amidst the conditions in each place, they were automatically contributing for the quality of health of the actors involved in the action and, indirectly, the entire school community” (A4); ii) “Contact with nature, the cultivation of medicinal plants and vegetables contribute significantly to make students aware of how important it is to adopt and appreciate sustainable actions that do good to the health of the planet and the human beings” (A2).*

Moreover, assessors highlighted that through experiences of cultivating food and the contact with different plants, students were awakened by the possibility of having some space for cultivation in their own homes/ this generated interest in health nutrition and sustainability for the whole family. In this process, the PCEs implemented

provided actions and reflections *"[...] related to the care of the environment we are a part of, which directly reflect in self-care and collective thinking"* (A3).

In compliance with the highlights indicated by the assessors, Sant'Ana, Cunha and Suanno (2016, p. 25) advocate that contemporary education must prioritize *"[...] the subjective construction of sustainable values and attitudes, intended for the balance of life in full and worldwide [...]"*, and that these pedagogical eco-forming practices provide students with reflections about the *"[...] care of nature viewed no longer from a West predatory and capitalist perspective, but rather arising from the consciousness and emotion of an interdependent belonging of man and nature"*.

For such, the relevance of an interdisciplinary view must be reiterated in the planning by binding what Nicolescu (2018) indicates to be among the disciplines, beyond them and through them. Likewise, the importance of eco-formation becomes clear when the pedagogical practices cooperate to improve the intra and interpersonal relations while students engage with the environment, as foreseen by Silva (2008) when this concept is discussed.

- **SDG 4 – Education with quality, inclusiveness, and equity:** it was linked to ECP *"Eco-Formative Creative Scenario: from the revitalization of the school grove to the full development of students"*. Assessors checked whether the actions foreseen in it encouraged practices of inclusive literacy committed to the students in their contexts of local belonging.

In spite of this SDG being an option by one of the four PCEs, the assessors observed its link with the four projects planned and implemented while the *"Program on Formation-Action in Creative Schools: literacy committed to local demands and its proximity to SDGs"*. According to A1, it was noted *"[...] that all PCEs encouraged practices of inclusive literacy and committed to the students, in all phases of the projects."* Accordingly, A2 recorded that *"The actions contained in the PCEs clearly contributed to encourage innovating practices in the perspective of an inclusive school conceived in and towards diversity [...]"*, appreciating the *"[...] the students' previous knowledge, establishing relationships between scientific knowledge and their participation in the social milieu"*.

Another highlight mentioned by the assessors was that, thanks to the ECP methodology, students take a leading role in the processes of teaching and learning as they are stimulated, in cooperation with teachers and other people involved in the project, to analyze, plan, create, propose and resolve real problems, contributing to self-esteem and self-confidence. In this regard, this methodology allowed for teaching

"[...] grounded on life, stimulating teachers and students to go 'beyond the reproduction' of knowledge and 'beyond the critical analysis of reality' [...]" (Zwierewicz, 2013, p. 166).

It should also be highlighted that the methodology enhances literacy practices that are inclusive and committed to the students in their contexts, as the projects allow *"[...] teachers to get closer to the reality where they work, making instruction more pertinent and significant also for the students"* (A5), by taking into consideration *"[...] the singularities of each community"* (A4).

Thus, it is understood that PCEs contributed to substantiate an education for sustainability which includes the SDGs in the school context and to quality the teaching and learning processes during the stage of acquiring literacy, with the involvement of the entire school community in the contexts of the research.

- **SDG 11 – Sustainable cities and communities:** it was linked to "Eco-Formative Creative Project School Vegetable Garden: sowing health" and to "Eco-Formative Creative Project: recycling for a sustainable future". Assessors analyzed whether its implementation encouraged students to reflect on the importance of their role in the sustainable development of their community and city.

Assessors responded affirmatively and also indicated the link between SDG to other projects. A1 mentioned, as an example, ECP *"Eco-Formative Creative Scenario: from revitalizing the school grove to the full development of students"*, highlighting how important those actions were as they addressed *"[...] multiple aspects involving not only the sustainable development but also aspects that are significant in promoting health and quality of life for the community living around the school in question"*.

For A4, SDG 11 became effective in the actions conducted in the PCEs considering that *"[...] students were active participants from planning up to implementing the projects [...]"*, stimulating the critical sense and the understanding that *"[...] we are responsible for our actions and they have consequences either good or bad in the future"*.

In her reasoning, A2 adds that, *"By involving the families in the Eco-Formative Creative Projects, students become aware of how their actions impact society [...]"*. Likewise, she emphasized how much the methodology *"[...] develops a sense of belonging in the students"*.

Reports like these are consistent with what Morin (2015a, p. 157) says about "Instruction should contribute not only to acknowledge our Nation-Land, but also allow this acknowledgment to translate into a desire of fulfilling our earthly citizenship". And

this desire is expressed through a sense that someone belongs to the context where he or she lives together with others, also, through the comprehension that the actions of everyone are essential for the present and the future of people and the environment.

By comprehending the impacts of local actions onto the global context and the worth of the commitment currently undertaken toward the future reality, complex thinking is stimulated. Therefore, by doing so, there is an effort to break up with some thinking that separates what is connected and unifies what is diverse, as advocated by Morin (2015b).

- **SDG 12 – responsible consumption and production:** it was linked to the four PCEs planned and implemented along the formation. Assessors analyzed their contributions so that students absorbed habits of conscientious consumption, by reflecting on the impacts their consumption habits have onto the planet's sustainability.

The assessors' conclusion confirmed the contribution. As examples, they noted: encouragement of the students' creativity in order to re-use packages and food items, highlighting the re-use of egg shells as seedbeds for organic cultivation; the use of recyclable to set up vegetable gardens and to make toys; and selective collection of the wastes produced by the students themselves, in order to raise awareness to the amount of garbage they produce.

For A1, the activities carried out along the PCEs had the students realize *"[...] the importance of the habits of conscientious consumption, also introducing sustainable alternatives for the use and re-use of several materials, either organic or not [...]".* As a complement, A4 emphasized that the actions conducted in the PCEs stimulated students to *"[...] reflect on the fact that habits of conscientious consumption need to be absorbed by the current generations since, in addition to contribute to our health, they preserve the environment with sustainable, less consumerist practices".*

By streamlining reflections on responsible consumption and production habits by means of initiatives in accordance with the possibilities of each context, the PCEs allowed for a formation capable of meeting demands considered necessary for the sustainable development of the entire planet. This happens because, due to actions intended to achieve the local demands, one contributes even if in a small scale to meet the global urgencies indicated by the SDGs, as it is understood that: "In order to enable changes and overcome these challenges on the local, national, regional, and global levels, we need new competencies, skills, values, and attitudes that make sure societies will be more sustainable [...]" (UNESCO, 2020, pp. 5-6). For such, the school is a fundamental place for this process since "[...] from a more comprehensive viewpoint, it



is directly connected to its community, which increases its importance and, consequently, its responsibility, as the knowledge produced at the school will reach out beyond its walls, influencing its surroundings as a whole" (UNESCO, 2020, pp. 5-6).

Once the possibility of linking the study of curricular contents to the SDGs was confirmed, it was found that the ECP methodology comes close to the pedagogical practice of demands in each context. In this case, the leading role of students in line with the teachers' commitment to the metamorphosis of the pedagogical practice turns out to be the condition for changes in planning instruction and implementing the actions as a result of it.

For such, once again the importance of the interface between formation and teaching is reinforced. For Nóvoa (2019), it is the formation that allows the metamorphosis of the pedagogical practice, since the involvement with the context of the teaching work benefits the joint reflection and implementing collective work.

### **Closing remarks**

Walking away from teacher training that is out-of-context and worldwide disconnected towards transdisciplinary eco-formative initiatives is as challenging as it the possibility of linking the study of curricular contents to local demands (context) and global demands, as observed in the SDGs and in their targets. By considering this possibility, this research allowed for some teacher formation committed to the metamorphosis of the pedagogical practice.

For such, a consolidated formation program was adopted but adjusted to the demands and potentialities from the participants in the new edition. In addition, the teaching methodology was utilized to enhance the collaborative work and to value protagonism in planning the instruction and in actions that may associate the curricular contents with the demands from the contexts the students are part of and with the global emergencies.

By streamlining the formative proposal, pertinent planning was mobilized by a transdisciplinary perspective to boost projects that took into account what had been included in the curricular components but also what is in between, beyond and through them. Therefore, the curricular content linked to what makes sense locally and to what affect the world population.

By valuing protagonism from a collaborative perspective, the formation and the PCEs planned and implemented motivated, while they were in progress, eco-formative pedagogical practices. This can be observed when reflections on the responsibility for

individual and/or collective attitudes were encouraged as well as on the consequences for the environment and the appreciation of inclusiveness in the school.

For such, the formation was based on a dialogical framework, on the hologrammatic view, and the recursive emphasis. The dialogical framework allows different ideas to interact, the hologrammatic view stimulates the formation to cope with local and global demands, e recursiveness enables the actions generated to give rise to new possibilities, which values teaching and learning processes that are the auto-constitutive, auto-organizing, and auto-producing. That is why, by proposing the intervention, this study prioritized a perspective of a spiraled formation-action, rooted in the appreciation of listening and in the collaborative work, and committed both to the students' demands and their contexts of belonging, as well as to the planetary emergencies.

Specifically, in relation to planning the projects linked to the SDGs, the formation proved to be a possibility which is boosted when teachers work collaboratively and when the formation stimulates the planning to include the reality of each school, without disregarding what happens beyond its premises. This process strengthens pertinent knowledge by locating curricular contents in the context so that they are meaningful and, at the same time, by stimulating the comprehension of the global problems, observing the local interference in them.

Therefore, this work is intended to be a way to articulate theory and practice, which is indispensable in process to teach literacy that overcome educational perspectives that are merely transmissive and reproductivist. In that case, the relevance of establishing links between formation and teacher work is reiterated as well as the use of a methodology that boosts the interdependence among the curricular components and between them and reality.

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**RESUMO:**

Este estudo sistematiza parte dos resultados de uma pesquisa-ação com ênfase na abordagem qualitativa, realizada com o objetivo de desenvolver uma proposta formativa transdisciplinar e ecoformadora com docentes alfabetizadores de escolas de Porto União, Santa Catarina, analisando seu potencial para o atendimento de demandas locais e sua aproximação dos Objetivos de Desenvolvimento Sustentável (ODS). Dentre os resultados, a pesquisa reitera a relevância da interface entre formação e profissão docente para a metamorfose da prática pedagógica e o potencial da metodologia dos PCE para aproximar os conteúdos curriculares de demandas locais e globais.

**PALAVRAS-CHAVE:** Educação Básica; Formação docente; Transdisciplinaridade; Ecoformação; Objetivos de Desenvolvimento Sustentável.

**RESUMEN:**

Este estudio sistematiza parte de los resultados de una investigación-acción con énfasis en un enfoque cualitativo, realizada con el objetivo de desarrollar una propuesta de formación transdisciplinaria y ecoformativa con alfabetizadores de escuelas de Porto União, Santa Catarina, analizando su potencial para la atención a las demandas locales y su enfoque hacia los Objetivos de Desarrollo Sostenible (ODS). Entre los resultados, la investigación reitera la relevancia de la interfaz entre la formación y la profesión docente para la metamorfosis de la práctica pedagógica y el potencial de la metodología PCE para acercar los contenidos curriculares a las demandas locales y globales.

**PALABRAS CLAVE:** Educación Básica; Formación docente; Transdisciplinaridad; Ecoformación; Objetivos de Desarrollo Sostenible.