Journal of Pedagogical Research
Onlinefirst Article
https://doi.org/10.33902/JPR.202636040

Research Article

Transformative education environments for sustainability: The perceptions of teachers in the University of the Basque Country

Itziar Rekalde-Rodríguez

University of the Basque Country, Spain (ORCID: 0000-0002-9297-6734)

Education for Sustainable Development at university level requires transformative education approaches that must be promoted by teachers as part of their practical activities. These approaches should engage learners in participatory, systemic, creative and innovative thinking and action processes in the context of local communities. Ocean i³ is an interdisciplinary, crossborder and intercultural learning environment that was created to respond to the plastic pollution problem along the Basque-Neoaquitaine coastline. The aim of this work is to understand the meaning that university teaching staff attach to the elements that make Ocean i³ a transformative environment in which education for sustainable development is promoted. The methodological approach is qualitative in nature, aimed at seeking the meaning and sense that *Ocean i³* provides for teachers. Twenty-three people participated through interviews, and focus group. The analytical procedure consisted in an inductive content analysis. The results reveal that the teaching staff perceive *Ocean i³* as a transformative education environment for university students due to its interdisciplinary approach, the challenge-based teaching methodology, the continuous collaboration with external agents related to the socioeconomic fabric of the region, the use of alternative spaces where academics can carry out educational activities, as well as the use of translanguaging to promote multilingual communication in the *Ocean i³* community in a natural way. The complexity of the Ocean i³ environment induces teachers to learn to reinvent themselves so they can drive transformative education for sustainable development.

Keywords: Education for sustainable development; Challenge-based learning; Higher education; Interdisciplinarity; Transformative environments

Article History: Submitted 12 May 2025; Revised 21 December 2025; Published online 20 January 2026

1. Introduction

The United Nations adopted the 2030 Agenda for Sustainable Development which sets out 17 goals, known as the Sustainable Development Goals [SDGs], which refer to the environmental, social and economic development of the planet (United Nations [UN], 2015). Since its adoption, many universities have taken on the 2030 Agenda as their own and have incorporated its principles and values into university objectives, policies, and activities in very different ways and forms (Alba, 2017; Leal Filho et al., 2018; Lozano, 2006; Sáez de Cámara et al., 2021). In fact, the

Address of Corresponding Author

Itziar Rekalde-Rodríguez, PhD, Faculty of Education, Phylosofi and Anthropology, Av. Tolosa 70, 20018 Donostia-San Sebastián, University of the Basque Country, Spain.

✉ itziar.rekalde@ehu.eus

How to cite: Rekalde-Rodríguez, I. (2026). Transformative education environments for sustainability: The perceptions of teachers in the University of the Basque Country. *Journal of Pedagogical Research.* Advance online publication. https://doi.org/10.33902/JPR.202634040

Declaration on University Global Engagement [DGE], signed at the UNITAR conference (2017), and University Global Coalition [UGC] formalised in Bellagio, Italy (2019), ask for monitoring the implementation of the SDG and greater collaboration between universities committed worldwide to creating a more sustainable future for all.

Furthermore, the Agenda is an opportunity for universities to rethink the role of higher education institutions. It helps to shed light on whether incorporating certain values and practices into their mission would be beneficial. As a result, an increasing number of universities are undertaking transformative projects that transcend the pedagogical focus of the classroom to address holistic dynamics; these experiences align universities with the SDG in a complex, comprehensive way (Mawonde & Togo, 2019; Mori et al., 2019; Paletta & Bonoli, 2019).

Spanish universities are progressively incorporating the concept of sustainability into their curricula, governing bodies, strategies and campus management plans (Barrón et al., 2010; Cebrián, 2020; Murga-Menoyo, 2015), while *Red Española para el Desarrollo Sostenible* (Spanish Network for Sustainable Development) is supporting this work with reports, manuals and good practices from universities that serve as examples for action in this area.

In the Spanish university context, the Conference of Rectors of Spanish Universities (Conferencia de Rectores de las Universidades Españolas [CRUE]) made achieving the SDG one of its priorities and proposed that Sustainable Development be considered as the core of its decisions and activities (CRUE, 2019). Likewise, the Basque University System Plan 2023-26 (Basque Government, 2023), the University of the Basque Country (2022) Strategic Plan 2022-25 (UPV/EHU), and the EHU agenda 2030 for the sustainable development of the University of the Basque Country (2019), together with its three sectoral plans (Equality Campus, Inclusion Campus and Planet Campus) contribute to creating a path towards sustainability in the Basque Country. The EHUagenda 2030 describes the contribution to 12 of the 17 SDG (Sáez de Cámara et al., 2021) and incorporates one goal called 17+1 referring to the development of the Basque language, Basque culture and multilingualism (University of the Basque Country, 2019). This objective arises from the idiosyncratic nature of the university and its enclave where an ancestral minority language, Basque, is maintained and enjoyed, sharing space and coexisting alongside other languages such as Spanish and French.

The University of the Basque Country has its own educational model called i^3 ("i ber hiru": ikaskuntza/learning x ikerkuntza/research x iraunkortasuna/sustainability), created by multiplying learning by research, and by sustainability. The understanding is that the capacity to learn multiplied by the capacity to research is not enough if the planet's greatest challenges are not put in the spotlight, and these currently take the form of the SDG. These three points of tension (Learning, Research and Sustainability), must be in the minds of all people involved in the university community in their actions with the social, economic, environmental and cultural environment (Servicio de Asesoramiento Educativo/Hezkuntza Laguntzarako Zerbitzua [SAE/HELAZ], 2023).

This is the context for Ocean i^3, an interdisciplinary, cross-border and intercultural learning environment aimed at the University of the Basque Country and the University of Bordeaux (New Aquitaine) community. Ocean i^3 is funded by the European Regional Development Fund [ERDF] through the third call for projects under the Interreg V-A Spain, France, Andorra (POCTEFA 2014-2020) programme. It aims to promote the development of sustainability and employability competencies linked to the blue economy of the cross-border coastline. Understanding the blue economy as a strategy to safeguard the world's oceans and water resources requires balancing two discourses: growth and development, and the protection of ocean resources (Lee et al., 2020). In this context, the students' academic work (mainly their End of Year Projects or Master's Degree Thesis, internships, and coursework) is done within an interdisciplinary and multi-agent team formed by students, teaching staff, social agents, and other collaborators (Rekalde-Rodríguez et al., 2021). Faculties from the three campuses that conform the University of the Basque Country, as well as degrees from the different fields of knowledge (Philology, Nursing, Psychology, Law,

Education, Economics, Engineering, Fine Arts, Advertising, etc.) have participated in the project. The team members work together to respond to a challenge related to an environmental and social problem: the need to reduce plastic pollution along the Basque-Neoaquitaine coastline (Cruz-Iglesias et al., 2022; Gil-Molina et al., 2024; Rekalde-Rodríguez et al., 2023). Ocean i³ responds to the positioning of both universities with respect to sustainability and the valuation of oceans, directly addressing the SDG of Underwater Life (14), Clean Water and Sanitation (6), and Quality Education (4) (UN, 2015). The Challenge-Based Education didactic-methodological approach is followed (Portuguez & Gomez, 2020), where ideas are exchanged, proposals are contrasted, and knowledge is co-created by the different participating groups in five workshops (Rekalde Rodríguez et al., 2021).

In this learning context, we asked ourselves: how do teachers perceive the Ocean i³ environment for sustainability? What elements do teachers identify in Ocean i³ that advocate for the literature in transformative education settings? How do teachers perceive and interpret these elements? How do these environments impact on teachers? In light of this, what should teachers consider when designing environments that foster transformative education for sustainability?

In short, the aim is to understand the meaning that university teaching staff attach to the elements that make Ocean i³ a transformative environment in which education for sustainable development is promoted. Knowledge about teachers' experiences and perceptions is particularly important so that those promoting it can assess and reorient its future design. In this regard, it is necessary to listen to teachers, who lead the educational process and can provide insights for this adjustment. Nevertheless, research on the varying contexts in which transformative learning and the transdisciplinary approach to addressing sustainability is enhanced is still weak and needs complex, in-depth and creative investigative approaches (Barth et al., 2023; Singer-Brodowski, 2023).

Moreover, when a teacher immerses themselves in a transformative education environment for sustainability, they participate in and co-create it (Lotz-Sisitka et al., 2024). Academia needs to know how teachers perceive the elements that make up the context in order to understand the meanings and nuances that teachers assign to them. While the literature provides insight into the themes or elements that make an educational context a transformative environment, this work reveals teachers' perceptions and opinions about them. It provides evidence on how teachers understand and adopt the principles of transformative education, which, beyond evaluating the coherence between theory and practice of the project in question, makes visible the meaning that teachers give to these elements so that progress can be made and teaching practice can be improved in transformative educational environments.

2. Theoretical Framework

Transformative education is conceptualised as those "educational practices that are informed by transformative learning theory and that foster deep engagement with and reflection on our taken-for-granted ways of viewing the world, resulting in fundamental shifts in how we see and understand ourselves and our relationship with the world" (Muñoz & Pérez, 2021, p. 7). Transformative education is inspired by Mezirow's (1991) theory of transformative learning, which conceives the early stages of a person's life as a time of training and the later stages as a time of transformation. This theory inspires the search for change in education to better respond to people's multiple forms of learning, address the barriers they face to learning effectively, and contribute to the transformation of societies. As Pérez (2022) points out, the notion of transformative education is closely related to all the educational practices and education environments that need to be questioned and redesigned to reimagine the role of education in our societies" (p. 4).

In this sense, understanding and addressing the SDG requires imagining the society we want for the future (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021) and the meaning of Education for Sustainable Development [ESD] itself (UNESCO, 2014). The

report *Reimagining our futures together. A new social contract for education* developed by the International Commission on the Futures of Education sets the stage for imagining what kind of society we want, and therefore, what we are asking of education. It is a plea to re-imagine a society concerned with and committed to peace, justice, ecology, and sustainability; a plea in the form of a social contract based on human rights and the principles of non-discrimination, respect for life, human dignity and cultural diversity. It embraces an ethic of care, reciprocity and solidarity through cultivating education as a public endeavour and common good (UNESCO, 2021). In the same vein, ESD advocates for and further develops informed decision-making and collective action for environmental, economic and social sustainability across generations, respecting cultural diversity (Kaplan & Sarisaltik, 2024). ESD aims to improve the capacity of individuals and communities to make informed decisions, and thus promote a shift towards a healthier and more ethical world. It aims to promote critical thinking, raises awareness, and empowers people to explore new ideas and develop innovative tools for sustainability (UN, 2024). It is a holistic and lifelong learning process that transforms both educational content and the society as a whole, promoting quality education to meet the needs of the present and the future (UNESCO, 2014). ESD empowers individuals to reflect on the social and environmental impacts of their current and future actions (Elmassah et al., 2020), develop competencies to cope with complex situations, and actively participate in promoting sustainable development in society (Barth & Rieckmann, 2016). Ultimately, ESD is recognised as a transformative approach that alters how teaching-learning processes are understood and implemented (Michelsen & Fischer, 2017), and helps to *reimagine* a sustainable joint future.

According to Singer-Brodowski (2023), transformative learning is the most effective learning theory for achieving sustainable development, particularly because of its emphasis on shifting perspectives of meaning in discussions with others in spaces free of coercion. As Mezirow (2000) stresses, when learners can critically reflect and change their perspectives of meaning, they can develop a more inclusive, critical, open and reflective view of the world and cultivate a deeper level of critical thinking. Not only is the transformation immediate, it also promotes long-term transformative effects (Muñoz & Pérez, 2021). The future, as Garcia-Alvarez et al. (2023) remind us, lies in moving to deeper levels of learning, transitioning from education on sustainability to education for sustainability, with the ultimate goal of education as sustainability. There is a clear need to mainstream ESD at university level to enhance individual capacity and commitment to building sustainable societies (Prabawani et al., 2020). Universities play an important role in shaping the future of global society in terms of sustainable development, as they generate new knowledge, contribute to developing appropriate competencies, and raise awareness of sustainability (Rieckmann, 2012). The fact that university students work and reflect on sustainability during their university education means that they take on ethical criteria for sustainable development as their own, incorporating sustainability as part of their professional competencies (Zinkunegi-Goitia & Rekalde-Rodríguez, 2022). But what do university teachers need to bear in mind with this approach?

It is clear that providing teachers with adequate support is key to successfully adopting and implementing ESD. In fact, the set of Priority Action Areas from the UNESCO's Global Action Programme includes an action focused on integrating ESD into both pre-service and in-service teacher training programmes (UNESCO, 2014). In fact, research suggests that competent and committed teachers are needed to effectively implement ESD throughout the education system (Brandt et al., 2022), and that when sustainability is implemented in university curricula through active teaching-learning strategies, future teachers acquire sustainability skills (Albareda-Tiana et al., 2019). However, for teachers to be prepared to embrace and integrate ESD into their daily practice, they must develop competencies to practice action-based transformative teaching methods that engage learners in participatory, systemic, creative and innovative thinking and action processes in the context of local communities and learners' daily lives (UNESCO, 2017).

As Sabbah (2021) recalls in the foreword to *Transformative Education: Meanings and Policy Implications*, we all have the right to transformative education, because it opens the door to critical and liberating thinking, and fosters formal and informal learning processes. Current literature is highlighting the inextricable link between transformative education and sustainability (Bourn & Soysal, 2021; Heumann, 2023; Rodriguez & Barth, 2020). In other words, ESD calls for transformative education approaches that require:

a) *A learner-centred approach.* Which emphasises the active development of knowledge rather than its mere transfer. Experience in social contexts; as a starting point to stimulate learning processes in students that tend to reflect on their own knowledge (Barth, 2015). In this regard, Kiss et al. (2024) explore how learning between students and the community reinforces the development of perspectives focused on sustainability.

b) *Action-based learning.* Students participate in actions that foster the development of competencies and values by connecting knowledge with lived experience. In this sense, the role of the teacher is to create a learning environment that stimulates students' experiences and reflective thinking processes (Calderwood & Rizzo, 2023).

c) *Active methodologies.* ESD requires educational strategies that promote student involvement in social transformation. Teaching strategies which nowadays seem to be more accredited with sustainable development are: teamwork and collaborative learning; discussion of moral dilemmas; problem- and project-based learning; case studies; Solidarity Learning and Service, etc. (Evans, 2019). Methodologies that promote *Challenge* teaching, as Escámez and López (2019) call it, aim to develop students' competencies by challenging their knowledge, strategies and skills for the sustainable development of the planet and of people and their living conditions. In short, active learning methodologies that make students a key part of the learning process.

d) *Interdisciplinary approaches.* It is difficult not to conceive of ESD without interdisciplinary and innovative practice (Barrón et al., 2010; Tilbury, 2011). The complex nature of sustainability challenges indicates the need for learning experiences that emphasise active and reflective learning, across and between disciplinary areas (Colomer et al., 2020). Indeed, the notion of learning for sustainability is prominent in the academic and policy world, where it encompasses the entire spectrum of formal, non-formal and informal learning, thus emphasising the transdisciplinary nature of learning for sustainability (Barth et al., 2023). In this transdisciplinary framework for transitions to sustainability, it is not only the learning space that is important, but those who participate in the learning process. In this sense, joint work promoting the generation of knowledge between academics and professionals is currently vital in ensuring knowledge from a social point of view is reinforced (Lang et al., 2012). Its core lies in the conviction that different forms of knowledge are needed to make progress in sustainability transformations (Schauppenlehner-kloyber & Penker, 2015).

e) *Transformative Teaching and Learning.* Transformative learning theory was was originally put forward by Mezirow (1991), and has found its way into higher education and adult education. It is used to understand how people interpret their experiences and to design educational interventions that facilitate reflective learning (Singer-Brodowski, 2023). ESD has adopted this approach as a way to encourage a change in mindset; the starting point to this approach is to recognise our current way of thinking by orienting it towards sustainability (Sterling et al., 2018). It seeks to empower learners to question and change ways of seeing and thinking in order to better understand the world and its processes (Mezirow, 2000). As Güvercin-Seçkin and Türkan (2024) highlighted, this theory emphasises critical thinking about one's own assumptions and the perspectives that underpin them. This process guides students to pass a reflective judgement on their beliefs, values, feelings and internal concepts. It also enhances creativity (Bishop & Etmanski, 2021). Transformative learning occurs when we give a realistic dimension to a new concept that is acquired. To do so, we must look at reality from a different, more flexible and open perspective, as opposed to accumulative learning based on what the student already knows, understands and has built up in their own mind (Prado, 2021).

So what should university teachers do to put transformative education into practice? A teacher is a facilitator who empowers and challenges learners to alter their worldviews. In this sense, there is talk of transgressive learning where it is emphasised that learning in ESD has to prepare students for disruptive thinking and the co-creation of new knowledge. This requires the creation of spaces and environments that stimulate student exploration, experimentation, reflection, and commitment to science seated in the place. In this task, teachers clearly play a crucial role (Lotz-Sisitka et al., 2015; Lotz-Sisitka et al., 2024). Indeed, in a society that is constantly changing, the teacher's task is to present learners with real environments that respond to sustainable transition challenges in a systematic and targeted way (Odum & Kordsmeier, 2023). Therefore, teachers who claim to offer situated transformative education processes for specific groups of learners cannot and should not guarantee that transformative learning processes will take place. However, they can and must create environments that enable the conditions required for transformative learning to take place (Singer-Brodowski, 2023). Moreover, transformative learning must be integrated into university curricula as a strategy to address new demands for complexity in learning; this includes equipping future professionals with knowledge and skills to transition to sustainable environments (Sibilla & Kurul, 2020; Slavich & Zimbardo, 2012). Furthermore, we must not forget that participation in these environments entails learning and growth processes for everyone who is immersed in them: students, teachers and social agents (Rekalde-Rodríguez et al., 2023).

3. Method

3.1. Research Design

An interpretive approach has been chosen based on the framework provided by the literature and the research goals. The research questions were how do teachers perceive the Ocean i³ environment for sustainability? What elements do teachers identify in Ocean i³ that advocate for the literature in transformative education settings? How do teachers perceive and interpret these elements? How do these environments affect teachers? As for the aim, it has been to understand the meaning that university teaching staff attach to the elements that make *Ocean i³* a transformative environment in which education for sustainable development is promoted.

The approach is based on the idea that social reality is constructed subjectively by people in interaction, so there is no single objective truth, but rather multiple realities interpreted from the experiences and perspectives of social actors. This perspective seeks to understand rather than explain or predict (Denzin & Lincoln, 2011). It is therefore used to seek the meaning and significance that participants give to their perception and experience of reality (Cotán, 2016). From this perspective, it is necessary to engage with and listen to the actors involved in the context through qualitative instruments such as interviews and discussion groups. For all these reasons, the qualitative alignment guides us through an investigation into unique and particular situations, as is the context of Ocean i³ and by that can provide a better understanding of the elements that university faculty identify in Ocean i³ as a transformative environment in which ESD can be promoted. In this sense, qualitative alignment allows for an exploration of the meanings that teachers attribute to these elements and helps to obtain clues that help to advance and improve teaching practice in transformative educational environments.

3.2. Participants

Twenty-three people directly or indirectly linked to the *Ocean i³* project participated in this research belonging to the three campuses of the University of the Basque Country using different research instruments. On the one hand, 14 teachers with different profiles, as shown in Table 1, were interviewed thoroughly, in order to understand how teachers perceive, interpret and affect those elements that the literature considers necessary when designing transformative education environments for sustainability. These teachers have been involved in the *Ocean i³* environment for at least three academic years, and they were contacted via a generic email sent to all teachers who had ever participated in this context (approximately 21 teachers). The interview is appropriate in

cases where the sample is small, in order to maximise the usefulness of the information. In other words, it allows you to obtain more in-depth, detailed and rich information from each participant, thus making the most of the information that each one provides (Flyvbjerg, 2011). The type of interview used was an in-depth interview, which allows the person to speak and think aloud, creating a conversation between the researcher and the interviewee (Kvale, 2007). In this technique interviewees were asked to observe, take note, and reflect on the key elements that make *Ocean i*[3] an ESD environment, why they thought so and how they believed those elements affected them. In short, the questions for the in-depth interview were elaborated based on the objectives and research questions, ensuring their consistency with the purpose of the research and their relevance for exploring in depth the subject of study (Flick, 2014).

Table 1
Profile of university teachers participating in the interviews

Code	*Gender*	*Age*	*Position/Experience*	*Degree*	*Faculty*
I1	Male	45	L/7	French Philology	Faculty of Humanities Vitoria-Gasteiz
I2	Female	37	A/7	Journalism	Faculty of Social Sciences and Communication Leioa (Biscay)
I3	Female	62	L/30	Law	Faculty of Law Donostia
I4	Male	63	P/34	Primary education	Faculty of Education Donostia
I5	Female	61	L/35	Fine Arts	Faculty of Fine Arts Leioa (Biscay)
I6	Male	56	A/14	Nursing	Faculty of Medicine and Nursing Donostia
I7	Male	59	P/26	Business Administration and Management	Faculty of Economics and Business Donostia
I8	Female	50	A/16	Pedagogy	Faculty of Education Donostia
I9	Female	48	L/20	Advertising and Public Relations	Faculty of Social Sciences and Communication Leioa (Biscay)
I10	Female	57	L/25	Early Childhood Education	Faculty of Education Donostia
I11	Female	52	L/23	Business Administration and Management	Faculty of Economics and Business Donostia
I12	Female	36	A/6	Social Education	Faculty of Education Donostia
I13	Female	48	L/17	Nursing	Faculty of Medicine and Nursing Donostia
I14	Female	45	L/16	Drawing	Faculty of Fine Arts Leioa (Biscay)

Note. University teaching staff positions have been coded using the following abbreviations; Professors (P), Lecturers (L), and Assistant professors (A). Experience refers to years of teaching experience.

On the other hand, a focus group was formed with six teachers, managers and/or353 coordinators of educational innovation projects for sustainability at the University of the Basque Country (see Table 2). These teachers were selected by the university's director of educational innovation, who took into account the coordinators' experience in the field of educational innovation and the impact of the project in the university and social context. The director recruited the teachers for this focus group because she has a broad and deep understanding of the content and development of the EHU's innovation projects. She took into account the participants' experience and impact of the projects when selecting these teachers, because they could provide valuable and relevant information. They have experienced and led complex innovation processes, facing new challenges, making decisions and evaluating results. They were therefore able to provide first-hand information, compare their opinions and enrich the dialogue with their reflections.

Table 2
Profile of university teachers participating in the focus group

Code	*Innovation project*	*Gender*	*Age*	*Position/ Experience*	*Degree*	*Faculty*
FG1	Director of Sustainability and Social Commitment (UPV/EHU)	Female	43	L/18	Environmental engineering	Bilbao School of Engineering
FG2	Formula Student Bizkaia	Male	39	A/14	Mechanical engineering	Bilbao School of Engineering
FG3	Development of Social Competencies in Sustainable Decision-Making: a simulator for Business and Economics and Social Education	Female	55	P/21	Economics	Faculty of Economics and Business of Bilbao
FG4	Transforming realities: University and Community cooperation to humanise education through Service-Learning	Female	36	A/10	Primary Education	Faculty of Education and Sport in Gasteiz
FG5	*Irratia* SDG Coordinator	Female	41	A/6	Social Education	Bilbao Faculty of Education
FG6	Co-ordinator of Co-operative and Research-Based Learning: developing a cross-curricular academic pathway to study the Social Economy	Male	44	L/13	Business Administration and Management	Faculty of Economics and Business, Donostia

Note. University teaching staff positions have been coded using the following abbreviations; Professors (P), 359 Lecturers (L), and Assistant professors (A).

3.3. Data Collection

The researcher conducted the 14 interviews and the focus group online via Teams (Microsoft M365), recorded, compiled, and transcribed the data. The interviews lasted between 45 minutes for the shortest and 70 minutes for the longest, with the total duration of the 14 interviews being 12 hours and 7 minutes, and that of the focus group being 1 hour and 32 minutes.

In the case of interviews, *Ocean i³* teachers were invited by email, to which was attached the informed consent form to participate in the research, explaining the purpose and objectives of the work, and a brief script with open-ended questions that were adapted in order and wording during the conversation. The aim was to build a relationship of trust between both parties to facilitate sincere and in-depth answers by asking clarifying questions.

These open-ended questions were related to interdisciplinarity, Challenge-Based Learning, stakeholder participation in the university student training process, the use of alternative spaces to university classrooms, and language exchange in a bilingual context such as the Basque Country, which is also multilingual due to its cross-border proximity. The focus was on topics that the literature identifies as key to transformative education approaches and on multilingualism, which is characteristic of the project's idiosyncrasy, in order to learn and understand how teachers perceive and interpret these elements, and how they influence them.

The protocol followed with the participants in the focus group was similar to that used in the interviews, although the identification process was carried out by the director of educational innovation service. Participation was voluntary, and to guarantee the confidentiality of responses, several ethical measures were adopted, such as obtaining informed consent, anonymizing recordings and transcripts, and restricted access to the researcher.

The focus group was used once the interview phase was completed, providing them with a script covering the topics to be discussed. The information obtained has been used to clarify, compare and discuss the results of the interviews (Francés et al., 2014). These instruments are intended to encourage participants to talk about the transformative education environment in which they have participated. Therefore, the terms used for the dialogue are those considered in Sabbah (2021), such as interdisciplinarity, active methodologies, student-centred teaching approaches, etc.

All testimonies were coded to preserve anonymity. The coding corresponds to the instrument + participant number. For example, I3 refers to the Interview of the 3rd teacher, and FG4 is the 4th participant in the focus group.

3.4. Data Analysis

The analytical process involved a deductive content analysis in terms of the a priori categories used to structure the interview and focus group questions, and inductive analysis in terms of discovering the surface and implicit meaning in the data (Kleinheksel et al., 2020). To this end, the construction of the categorical system was based on broad dimensions around which teachers were questioned in interviews and focus groups. These differentiated units of meaning were assigned a category, which was specified according to their content (Flick, 2014). This analysis process is a spiral process of understanding, where emerging categories are integrated into the spiral (reduction, analysis, and interpretation) and reshape the system (Cisterna, 2005). For this reason, this system has been adapted, remodelled and tested as the analysis has progressed (McMillan & Schumacher, 2009). For example, the topic of interdisciplinarity was an element that participants were asked about and on which they have had the opportunity to provide information regarding its importance, its value in terms of employability and social impact, and the problems involved in its inclusion in the curriculum. In addition, under the heading of curricular integration, teachers expressed their views on the most appropriate strategies for implementing interdisciplinarity, the flexible structures required, and the problems that result with respect to evaluation. The inductive categorical system that has been constructed to interpret the key elements that make *Ocean i³* a transformative ESD environment, as reported by the university teaching staff, is shown in Table 3. The nuances that participants' testimonies gave to the category of *Inclusion in curricula* required the introduction of subcategories to capture them.

Table 3
Categorical system

Theme	*Category*	*Subcategory*
Interdisciplinarity	Exchanging viewpoints	
	Employability	
	Inclusion in curricula	Strategic
		Flexible structures
		Evaluation
Challenge-Based Learning (CBL)	Complex and daring	
	Opportunity	
	Guidance	
External stakeholders	Sense for learning	
	Stakeholder involvement	
	Stakeholder role	
Alternative spaces	Enriching	
	Neutrality	
	Coexistence	
	Creativity	
	New conquests	
Translanguaging	Language coexistence	
	Communication	
	Translation resources	
	Making languages visible	

The qualitative analysis programme Nvivo 14 was used to process all the information and manage the data, and the steps outlined by Sabariego (2024) were followed; create the project, import, organise and code the data (in our case, inductive manual), hierarchise the codes and, analyse and interpret. With regard to scientific rigour, the criterion for excellence for naturalistic research is veracity, which must be present throughout the qualitative research process (Tracy, 2010). In this work, it is articulated through the following characteristics: a) Credibility: an attempt has been made to gather as much information as possible with the aim of reconstructing the key elements that make Ocean i^3 a transformative ESD environment. To this end, triangulation has been carried out between the teaching staff participating in Ocean i^3 and those participating in other ESD environments at the university; b) Transferability: the sample used allows the findings to be transferred to other contexts similar to the one analysed, as the study offers a rich and detailed description of the context, participants and research process. This provides readers with the information they need to determine whether the results are relevant or useful to their own reality; c) Dependability: In this study, different instruments (interviews and focus groups) were used, which yielded very similar results, allowing us to deduce their stability. Finally, d) Confirmability: this is emphasised by using low-level descriptors (transcripts) that record the testimonies as faithfully as possible (Gurdián-Fernández, 2007). Finally, with regard to ethical issues, the people involved and the use and handling of the data obtained have been rigorously monitored (Blaxter et al., 2010). Specifically, the research has been favourably evaluated by the Ethics Committee for Human Research of the University of the Basque Country. The reference is M10_2023_377 and approved on 14 December 2023. In accordance with the European Data Protection Regulation (EU2016/679), the data have been recorded under code TI0625 at the University of the Basque Country.

4. Results

The results are presented according to the content of Table III, which guides the reporting of results. The university teaching staff provides content the following elements in the Ocean i^3 environment as key elements that drive transformative education: interdisciplinarity; the active

methodology called Challenge-Based Learning; the participation of external stakeholders in the learning co-construction process; the use of alternative spaces to develop the project; and the translanguaging approach to communication in a multicultural and cross-border environment.

4.1. Teachers' Perceptions of Interdisciplinarity at Ocean I³

With regard to interdisciplinarity in Ocean i³, the teaching staff recognise the importance of the cross-disciplinary nature of this approach, its value in terms of employability and social impact, and the problems surrounding interdisciplinarity in the search for an appropriate place for it in the curricula.

The theme of interdisciplinarity is perhaps the concept that stands out for being a differentiating element that at the same time is transformative in teaching-learning practices. In this sense, one of the teachers highlights the value that this element has for the learning process in itself, but above all what interdisciplinarity means and represents in practice, the value of seeing how it is materialised, being able to live and experience it in the project environment. Teachers highlight the possibility of offering students the conditions to accommodate transformative education in teaching practice:

> In a way, Ocean is a specific context that provides a runway on how to implement the interdisciplinary approach. We have come across this idea many times and in different areas, but they eventually didn't take off. It is difficult to find such a runway space and a concrete and precise production of it, all of which can be found in Ocean and for me that is key. (I7)

On the one hand, the teachers recognise the importance of exchanging viewpoints in approaching educational processes from an interdisciplinary perspective. They highlighted the following aspects that impact everyone participating in the Ocean i³ project: exchanging convergent and divergent points of view; the intervention approaches according to the field of knowledge; expanding horizons; being receptive to other approaches; and appropriating what is being shared among others: "The fact that people from very different disciplines with very different points of view and approaches come together invites you to see the same problem from different points of view" (FG4); or this other testimony "I found it very positive to work on the same object from different disciplines, to see that there are many points that converge, that we are not so far apart […]" (I2);

> For me, it's a source of richness because not only do I contribute an approach from my discipline, but I also take on board the points of view of others from different areas so that I can rethink and re-propose, and so. (FG5)

It is interesting how sharing different perspectives on the same problem allows them to value each other's contributions while questioning their own perspective within that dialogue:

> The thing is, we feel comfortable working only within our own discipline, but when we start working with people from areas as diverse as Pedagogy, Journalism or Fine Arts in a collaborative way all is more complex. You see what others think and how they do things makes you realise the significance that our work can have for others, and notice issues that you would otherwise not even notice. (I14)

At the same time, the impact this participation has on their own training is repeatedly underlined:

> […] First of all, it has helped me to train myself, I have learnt about other disciplines which, while it is not difficult to have contact or access to these disciplines, you don't read specialised literature in nursing or any other field. […]. Students find it attractive to see how their work influences others' work, and others' work influences theirs. Because knowledge is built up little by little. And it has been very formative, not only for the students, but for everyone who participates in Ocean and for myself. (I3)

The collaborative work involved in the interdisciplinary approach is also highlighted: "[…] The fact that we had to work collaboratively between three or four disciplines to be able to respond to the challenge posed by the social agent is very enriching" (I8).

Likewise, teachers stress the value of interdisciplinarity in terms of students' employability and the consequent social impact on the region. The voices refer to the development of employability skills that the transdisciplinary approach promotes, based on an environment of education for sustainability:

> In reality there are no subjects, just challenges to be solved. We have a reality that is not watertight and in that reality […]. I think it is very interesting to start this collaboration from the point of view of interdisciplinarity, and also because we work on transversal competencies that place students very well in the job market […]. (FG2)

Finally, teachers raise the issue of interdisciplinarity in relation to searching for the most appropriate or strategic point where it can be included in the curricula. This is particularly in relation to the flexibility that university structures must have so that it can be included with greater ease, as well as the interdisciplinary viewpoint required when evaluating the processes and products carried out in such an environment.

One of the questions that teachers ask themselves is how to make this interdisciplinary perspective a reality within the curricular structure. The testimonies point to the Final Year Project/Master's Thesis as a malleable and permeable subject in which it is easier to work with. Teachers also question the rigidity of university structures to accommodate more open ways of approaching the teaching-learning process:

> It's not the themes we deal with, but the structures that are more closed-minded than a project of this kind allows. We should be open to other doors that may open and close, and not to an impassable Chinese wall system, but something more flexible. (I6)

In the same vein, problems surrounding the element of evaluation are also raised. It becomes clear that interdisciplinary approaches require an evaluation that takes into account a multiple and divergent view. In this context, social agents are heavily involved in student training, but they are excluded from the academic assessment process carried out on students. One stated: "I believe external agents need to participate in the Final Year Project viva and assessment processes so that this interdisciplinarity and impact on the region can be assessed" (I11).

4.2. Teachers' Perspectives on the Active CBL Methodology at Ocean I^3

Regarding the active methodology called Challenge-Based Learning used in Ocean i^3, teachers recognise the complexity and boldness of the approach, because of its direct impact on reality, because of the action objectives that are set, and because the activities themselves alter the academic and social environment. According to testimonies, it is not easy to offer students contexts of this nature: "We put them in front of a complex challenge, […], and that is very enriching for the students. It is a very rich experience that they don't come across at school or in any other subject" (I11).This methodology requires stepping outside the walls of academia to engage with and connect to reality:

> It is a way to connect with reality. We often work with laboratory assumptions, […], and in this way you try to give an answer to real problems. That's what students really get out of it; to see that their work can have an impact on reality. In my case, how the circular economy influences the environment. (I3)

Moreover, the teachers underline the importance not only of the methodology used, but also of the choreography this involves, which is crucial to the success of the learning process. In short, the guidance and the relationship that is established in this itinerary is one of the key features of the Ocean i^3 environment:

> The challenge can be problematic, complicated, but listening to other people, to social agents, to colleagues, to teachers... in this way, small contributions are made in order to respond to the challenge. (GD3)

Other voices highlight the difficulty of initial engagement with the methodology for addressing complex challenges such as those studied; the initial confusion and disorientation of students is

part of the learning process. Hence the importance of guidance and orientation in the development of the methodology:

> I thought the challenge approach was appropriate, although sometimes it can be confusing, especially for students, when it is such a complex project. This is why the guidance work is so important in building trust, bonds of trust that reinforce the role of these students in the group […] I think that the guidance part is fundamental. (I7)

4.3. Teachers' Views on the Role of External Stakeholders at Ocean i^3

With regard to collaborations with people outside the university community in the approach set out in Ocean i^3, the teachers recognise the meaning this has for learning. They underline the importance of engaging social agents in the process while raising the problem of their role; as a role in contrasting and monitoring responses to the challenge, as an agent for dialogue, etc.:

> Collaborating with external agents; economic, cultural, social..., brings meaning to learning […] Collaborating with external agents makes students see what they are learning for, and how they can use it to solve real challenging situations. It allows them to see how they learn from each other, how they need each other to solve challenges. (I1)

Despite the effort and the work involved, the need for collaborative work between the university and society is vindicated; a binomial that must now be inseparable:

> I believe that if you want to make challenges aligned with the needs of the environment, having the presence of real social agents is necessary and essential so that everything makes sense. (I10)

Other voice adds how important it is for teachers to be in touch with socio-environmental issues, so that what is taught in academia is closely related to the real world:

> It seems to me that as university professors we have to be much more in touch with what is happening and how problems are being addressed in reality. More in touch with the workers who handle these problems; we can't talk about the things we talk about, or teach the things we teach, without really getting to know them. (I12)

They point out that they find a weak connection between social agents and local organizations, and the university and the different departments that are part of the academic world. They note how this complicity is not the norm, but the exception:

> It has been a good experience to listen to the companies and it is important for the university to have relations with the business world. I feel like the university is missing a classroom, a space where there can be direct contact with companies. (I4)

The teachers raise the issue of the role played by the agents, referring to their function of contrasting and monitoring the responses that the Ocean i^3 community offers to the challenge, which they consider to be key in the students' training process:

> Social agents help to give a different point of view. […]. The agents offer us a different point of view, a point of view of the job market, what they do in their company, which is very enriching and contributes a lot. (I4)

In this sense, it is very interesting to hear how they underline the functions of the social agents in this framework, as well as the training necessary for them as facilitators and collaborators in the learning process of university students, as well as co-trainers with the teaching staff. The importance of social agents in this training process is emphasised, given that they not only have an advisory role but also are permanent training agents throughout the Ocean i^3 experience. For this reason, some voices highlight the need to train those who are also training alongside teachers:

> When we incorporate social agents […]. We also invite them to contribute to improving what we do, we turn them into training agents, agents who participate in the training process for our students. So what training does the trainer have? What advice does the advisor have? What are the social agents trained in? And how can they do their work?. (I10)

Undoubtedly, the teaching staff who have gone through all the editions of Ocean i^3 have seen a positive evolution in the role that the social agents have assumed in this environment; going from

a more client role, asking for results, to showing a more helpful, participative and coconstructive attitude towards the training process of the students:

> Agents have a key role to play.[…]. The agents are very important, in the content of the challenge, but also in the guidance part because it is very different from what we have with our students as teachers. (I14)

4.4. Teachers' Perceptions of the Importance of Alternative Learning Spaces at Ocean I[3]

As for the alternative spaces that have been used outside those offered by the university, the teachers highlight the richness they provide, the neutrality they offer, the coexistence they generate, the creativity they promote, and the reclamation of social spaces where knowledge can be developed.

The teachers recognise the richness of these alternative spaces in that they break-up the monotony and make the participants more receptive:

> It's physically leaving the classroom and it's like your mind changes and you are exposed to perceive another type of information, you know that there is something that is different, and I think it is vital and we should do it more. (I11)

The teachers also emphasise the neutrality offered by these spaces outside the university, where students, teachers and social agents come together in a space that is neutral for everyone, where there are no initial restrictions because of what this space represents for the participants: "I think it is exceptional in a good way. We are all the same, it is not a faculty space, it does not belong to anyone and it belongs to everyone […]" (I4).

The testimonies highlight the value of open spaces in breaking down the power relations that are so clearly evident in classrooms:

> The institution or being inside classrooms helps to perpetuate the hierarchy.[…]. However, being outside those walls helps to relate from another point of view; it helps to break up the relational distance, being in a neutral place helps us to open up in a different way. (I8)

With regard to the coexistence generated in these alternative spaces to the university, it is clear that the space motivates participants and encourages the formation of a more solid and stable human team, as well as reinforcing the meaning of coexistence in such an environment:

> As a teacher, it makes you get more involved because you not only associate it with the professional field as a teacher, but you also generate links on a personal level because you spend time with the community. So it helps you to be much more involved, and it helps both students and teachers to be more motivated. (I2)

The voices emphasise the importance of face-to-face interaction, physical contact and diversity of settings in education for sustainable development. One of the voices recalls how the programme was handled during the last global health emergency:

> I believe that coexistence is fundamental, and I think that we need to have more and more different spaces where we can live together. I think that is the trend and it has been a key element for me in Ocean. For example, during the two years online during the COVID pandemic I missed sharing real physical spaces with others. We lost the vocation to come together which is what sets this project apart. Of course we tried to compensate not being face-to-face as best we could, but it wasn't the same. (I7)

There is also the issue of creativity that is driven by these alternative spaces; spaces to open one's mind, think differently and come up with new and creative ideas. In this respect, the teachers commented that: Getting out of the classroom, away from the routine, away from regulatory spaces and into more playful spaces really helps. Playfulness encourages creativity" (I14).

Others emphasise the feeling of freedom and the predisposition to be more creative in these alternative spaces to those traditionally considered academic:

> The act of going to alternative spaces opens one's mind to other possibilities, as there are more options to get away from the usual channels. These kinds of dynamics drive creativity and make it

> easier to get out of our usual habits. It is easier to get away from regular trains of thought when you are in different spaces. It is refreshing and it makes us more open and creative. (I1)

Others add:

> I think it's great to get away from the classroom. I have had a very positive experience because they are alternative spaces, spaces that bring you closer to society, to culture, to different regions and to different people; they are spaces that are open to generating good ideas and being more creative. (I9)

It seems that these alternative spaces invite further experimentation and push the boundaries of what we have so far known and recognised as an academic space; they are new conquests within our reach: "Getting out of the classroom, moving away from the conventional... breaking away from academia is what students value most. Transgressing the walls" (GD5).

Others testimonies add that entering an alternative space of this kind makes you more inclined to participate in other similar spaces, to break the inertia of accepting the status quo:

> Breaking down walls... if you are already proactive through an active learning methodology at the university, if the walls are also broken down and you get away from the academic world and meet other people in other spaces in other faculties and universities, then this invites you to continue breaking down more walls and borders... I believe this motivates work and learning. It allows you to expand and enrich your mind, rather than contract it and make it poorer; thus creating the possibility of change in a more global and general way. (I5)

4.5. Teachers' Assessment of Translanguaging

Translanguaging on the other hand is understood as the coexistence of different languages in the context of the project. In this respect, the teachers point to the richness of the Ocean i³ context as it encourages different languages to coexist. Teachers also underline the main objective of using different languages, which was communication between the participants and the implementation of translanguaging. They highlight the use of simultaneous interpreting services provided by the French philology students, the importance of the visibility of the languages as a value, and the richness of the cross-border enclave.

In terms of the richness of the Ocean i³ context for promoting the coexistence of different languages, the fact that it is experienced as a safe space where different languages coexist and interact is highlighted. This space enables participants to use their entire linguistic repertoire to understand and communicate with each other: "I have had a really positive experience and it helps you to stop feeling embarrassed. You can get over the embarrassment in this context because you learn by doing" (I4).

Other voices highlight the initial difficulty: "For me it is another element we have to learn to live with. The first time you are in a multilingual environment is difficult, because you are not used to it" (I7).

The teachers also stress that the main objective of using different languages in Ocean i³ has been communication between the participants. To this end, the implementation of translanguaging, understood as the use of multilingualism in a natural and fluent way between languages and with constant exchanges, is perceived positively:

> […] At first, it was one of the things that scared me the most. When I saw that the languages were Basque, Spanish, French and English. I thought, uifff, […]. As the years have gone by, far from holding me back, it has opened me up in that sense as well. It has not restricted my freedom to express myself, I have been free to communicate in the language I wanted to. I have enjoyed getting closer to other languages such as French, having simultaneous interpreting into Basque, Spanish, etc. I thought it was a great way for us to understand each other and for language not to be an obstacle […]. (I9)

Furthermore, emphasis is consistently placed on communication in a multilingual context such as Ocean i³ as the key to reaching an understanding between people, as opposed to learning a language:

> I believe it was good to have the peace of mind to speak in the language you wanted; not to feel terrible if you can't speak a word of another language, and to make sure nobody felt bad because

> they weren't able to use another language. I think it was a good approach to ensure that communication flowed. We could communicate with each other in context, naturally and without pressure. It also made the relationships feel more relaxed. (I8)

The repertoire of valuable material and human resources that have been deployed in the context to make room for translation was also valued highly, such as the use of a simultaneous interpreting service provided by students taking a Bachelor's Degree in French Philology: "In the case of the translation and interpreting internship, I think the students felt that it added a cross-discipline component to the project and helped communication between participants" (I1), and "I can't speak a word of French, but I enjoyed the English, Spanish and Basque languages. The translation students who helped us were great and helped us at all times. It has been fun" (I13).

The linguistic support of the entire community was also emphasised. In this context, the entire linguistic repertoire that everyone brought with them was considered a resource that was made available to the community. This has been appreciated and perceived as a priceless gift: "I have zero knowledge of French, but there was always someone to help you and that didn't make me feel bad or uncomfortable, quite the contrary" (I9).

Others voices highlight the value of having simultaneous translation available thanks to the practical experience of students on the Translation and Interpreting Degree course:

> The way the project is run using simultaneous interpreting so you can use the language in which you feel most comfortable... for me this context has made me more open about making an international move, particularly given the resources provided and the support and protection I perceived. I wouldn't dare to do that in a different context. (I5)

Finally, the teachers stressed the importance of language visibility, particularly for a minority language such as Basque. It is highlighted as something that adds value and depth to the context in which the project is based; a cross-border context that shares its own culture and language, Basque:

> We often don't realise the impact that language and culture can have on the way we approach certain issues or problems. And how we can find solutions to problems through different cultures and languages. Giving visibility and space to minority languages is very positive. (I1)

5. Discussion

The teachers have highlighted the meaning that certain elements have for them in a transformative education environment for ESD. These elements are interdisciplinarity, the use of the active methodology known as Challenge-Based Learning, the participation of external agents in the students' training process, the use of alternative spaces where the project is developed and, finally, the translanguaging approach. These elements are in line with what UNESCO (2017) specifies when it states that transformative teaching practice should be action-oriented and involve students in participatory, systemic, creative and innovative thinking and action processes in the context of local communities. These elements align with the ideas proposed by Sabbah (2021) in relation to the key features of transformative environments, where he emphasises interdisciplinarity, active methodologies, student-centred pedagogical approaches, etc. This similarity leads us to consider these learning environments as transformative educational environments.

Teachers recognise *interdisciplinarity* as the confluence of different approaches to thinking about a particular problem. An approach such as this with multiple angles implies the exchange of convergent and divergent points of view provoked by the approach itself. The findings showed that interdisciplinarity creates different focal points based on the field of knowledge from which teachers come and allows them to broaden their perspective through dialogue with others from different areas of knowledge. Participants are made more receptive to other approaches and are able to take on the knowledge shared as their own. However, the teaching staff do raise the issue of interdisciplinarity in relation to finding the most appropriate or strategic way it can be included in the curricula. University structures need to be more flexible so that interdisciplinarity can be implemented with greater ease. The results indicated that teachers also stress that the processes

and products created using this approach need to be evaluated from an interdisciplinary perspective. It is a learner-centred approach that stimulates reflection from different perspectives in order to question the way in which students see, think and act. This is in line with the literature with regard to transformative education (Barth, 2015; Colomer et al., 2020; Slavich & Zimbardo, 2012). Interdisciplinarity is intertwined with the concept of transformative learning, which aims to empower students to question and change their ways of seeing and thinking, with the goal of better understanding the world and its processes (Mezirow, 2000). This promotes the transformations required for sustainability (Schauppenlehner-Kloiber & Penker, 2015; Singer-Brodowski, 2023).

With regard to *Challenge-Based Learning*, the findings reveals that the teaching staff recognise the complexity and boldness of the approach because of its direct impact on reality. This is due to the action objectives that are set, because the activities themselves alter the academic environment and the regional fabric through interactions with social agents. In short, the choreography required by the methodology is highlighted in line with what authors such as Escámez and López (2019) and Evans (2019), point out. In order to provide students with real-world environments that support appropriate and relevant responses to challenges related to sustainable transitions (Odum & Kordsmeier, 2023).

With regards to *collaboration with people outside the university*, the findings showed that teachers emphasise the fact that the academic world is brought closer to reality, giving practical meaning to what is being learnt. Issues with external agents are also raised. On the one hand, they play a role in contrasting and monitoring the responses that the Ocean i^3 community offers to the challenge, which is considered a key part of the training process. On the other hand, the agents play a role in promoting dialogue, providing contrasting view points, and discussing the viability of the proposals to tackle the challenge. Teachers mention that there should be more continuous contact with social agents and supervision from them. In short, a closer relationship throughout the learning process. The idea of defining the roles that social agents play is also reinforced. Above all, the training provided for social agents in an environment such as Ocean i^3 is stressed, as the social agents act as facilitators and collaborators in the university learning process. In this sense, let us not forget that the role of teachers and social agents is crucial in ESD (UNESCO, 2017), because they are the ones who alter students' worldviews (Prado, 2021).

Furthermore, the results indicated that joint efforts to generate knowledge among teachers, social agents and students make this knowledge more solid from a social point of view (Lang et al., 2012) and enable progress to be made in the transformations required for sustainability (Singer-Brodowski, 2023).

With regards to *alternative spaces* other than those offered by the university, the richness they provide is highlighted as they break-up the monotony and make the participants more receptive. The results pointed out that the neutrality offered by these spaces outside the university, where students, teachers and social agents come together in a space that is neutral for everyone, is underlined as a key element that contributes to the implementation of a transformative education process. The coexistence that is generated in these alternative spaces is another key factor, as participant motivation in reinforced and creativity is fostered as participants perceive the spaces as playful, open and non-restrictive spaces. It seems that these *different* spaces invite us to continue experimenting and pushing the boundaries of what we have so far known and recognised as an academic space; they are new conquests that are within our reach. Previous research also confirms this idea (Rekalde-Rodríguez et al., 2023). In this sense, teachers cannot guarantee that transformative learning processes will occur, although they can offer open, pluralistic, and participatory environments to facilitate transformative learning (Lotz-Sisitka et al., 2015; Singer-Brodowski, 2023).

Finally, the implementation of *translanguaging* has favoured communication and fostered collaborative work, understanding, respect and mutual help within a *protected* context. In short, it reinforces the idea of a community of people who are constantly learning and who are needed to

respond to existing sustainability challenges (UNESCO, 2014, 2017), in an environment that favours informal learning processes as part of transformative education (Sabbah, 2021).

6. Conclusions and Implications

The conclusions drawn from this study highlight insights generated from investigating teachers' perceptions of the elements that make *Ocean i³* a transformative environment in which ESD is promoted. Specific insights relevant to each theme include:

Interdisciplinarity. Specifically highlighting the exchange of viewpoints on an object of study, the collaborative work that is promoted, and the impact on the students' employability. However, interdisciplinarity is not exempt from problems when it comes to including it in the university curricula. More flexible structures that can be adapted to the region, and diverse, divergent and ecological assessment systems are required to make a transformative education process a reality.

Challenge-Based Learning. A complex and daring methodology where networks of complicity need to be built and solid alliances need to be formed with regional entities so that the choreography required by this methodology can drive transformative education.

Social agents. Collaboration with people from outside the university community is what gives meaning to the entire sustainability learning environment. The role social agents play as trainers and their involvement in the transformative environment give meaning to the students' learning process.

Alternative spaces. Aside from what the university provides, a transformative university learning process demands a break away from the monotony, seeking neutrality and fostering creativity in playful and open spaces. These alternative spaces should invite further experimentation and break down the boundaries of what we have understood and recognised as an academic space thus far.

Translanguaging. The natural use of intermingling languages to keep communication flowing and to continuously exchange ideas helps to shape the transformative learning process into one that advocates respect for different languages and cultures, in which minorities are made visible, empowered and valued.

Learning in the complex and unstable environment promoted by Ocean i³ calls into question certainties associated with the complexity of the environment itself. It causes teachers to reinvent themselves so they can promote transformative education for sustainable development. As one of the teachers acknowledges: "I believe that a teacher's role is not so much to transmit knowledge but to create learning spaces and situations so that students can learn. The more these situations are linked to a specific reality, the richer it will be, and the more it will contribute to the students' learning process" (FG1). Ocean i³ allows teachers to work on improving teaching methods through enquiry and reflection. It requires teachers to always be inquisitive and in constant dialogue with the people participating in the environment so that they are able to question and interpret what is happening.

Acknowledgements: The author wants to thank the teachers for their participation in this study. This work would not have been possible without their dedication and testimonies.

Declaration of Interest: The author declare no potential conflicts of interest.

Data Availability: Data is unavailable due to ethical restrictions.

Ethical Statement: The research has been favourably evaluated by the Ethics Committee for Human Research of the University of the Basque Country. The reference is M10_2023_377 and approve 14 December 2023. In accordance with the European Data Protection Regulation (EU2016/679), the data have been recorded under code TI0625 at the University of the Basque Country.

Funding: The current study has not obtained funding. It has been developed under the auspices of *IkasGaraia*, a consolidated research group of the Basque Government (IT1637-22).

References

Alba, D. (2017). Hacia una fundamentación de la sostenibilidad en la educación superior [Towards the foundation for the sustainability in Higher Education]. *Revista Iberoamericana de Educación*, *73*, 15-34. https://doi.org/10.35362/rie730197

Albareda-Tiana, S., García-González, E., Jiménez-Fontana, R. & Solís-Espallargas, C. (2019). Implementing Pedagogical Approaches for ESD in Initial Teacher Training at Spanish Universities. *Sustainability*, *11*(18), 4927. https://doi.org/10.3390/su11184927

Barrón, A., Navarrete, A. & Ferrer-Balas, D. (2010). Sostenibilización curricular en las universidades españolas. ¿Ha llegado la hora de actuar? [Curriculum sustainability in Spanish universities. Is it time to take action?]. *Revista Eureka sobre enseñanza y divulgación de las ciencias*, *7*(4), 388-399.

Barth, M. (2015). *Implementing Sustainability in Higher Education Learning in an age of transformation*. Routledge.

Barth, M. & Rieckmann, M. (2016). State of the art in research on higher education for sustainable development. In M. Barth, G. Michelsen, M. Rieckmann & I. Thomas (Eds.). *Routledge Handbook of Higher Education for Sustainable Development* (pp.100-113). Routledge.

Barth, M., Jiménez-Aceituno, A., Lam, D.P.M., Bürgener, L. & Lang, D.J. (2023). Transdisciplinary learning as a key leverage for sustainability transformations. *Current Opinion in Environmental Sustainability*, *64*, 101361. https://doi.org/10.1016/j.cosust.2023.101361

Basque Government. (2023). *Plan del Sistema Universitario Vasco 2023-2026* [Basque University System Plan 2023–2026]. https://www.euskadi.eus/contenidos/informacion/uni_planes_universitarios/es_def/adjuntos/plan_sistema_universitario_23_26_c.pdf

Bishop, K. & Etmanski, C. (2021). Down the rabbit hole: Creating a transformative learning environment. *Studies in the Education of Adults*, *53*(2), 133-145. https://doi.org/10.1080/02660830.2021.1879454

Blaxter, L., Hughes, C. & Tight, M. (2010). *How to research*. McGraw-Hill Education.

Bourn, D. & Soysal, N. (2021). Transformative learning and pedagogical approaches in education for sustainable development: are initial teacher education programmes in england and turkey ready for creating agents of change for sustainability? *Sustainability*, *13*(16), 8973. https://doi.org/10.3390/su13168973

Brandt, J. O., Barth, M., Hale, A. & Merritt, E. (2022). Developing ESD-specific professional action competence for teachers: knowledge, skills, and attitudes in implementing ESD at the school level. *Environmental Education Research*, *28*(12), 1691-1729. https://doi.org/10.1080/13504622.2022.2064973

Calderwood, K. A. & Rizzo, L. (2023). Co-Creating a Transformative Learning Environment through the Student-Supervisor Relationship: Results of a Social Work Field Placement Duo-Ethnography. *Journal of Transformative Education*, *21*(1), 138-156. https://doi.org/10.1177/15413446221079590

Cebrián, G. (2020). La educación para el desarrollo sostenible en el currículum universitario: una investigación-acción cooperativa con profesorado [Education for sustainable development in the university curriculum: a cooperative action research project with teaching staff]. *Revista Iberoamericana de Educación Superior*, *11*(30), 99-114. https://doi.org/10.22201/iisue.20072872e.2020.30.590

Cisterna, F. (2005). Categorización y triangulación como procesos de validación del conocimiento en investigación cualitativa [Categorisation and triangulation as processes for validating knowledge in qualitative research]. *Theoria*, *14*(1), 61-71.

Colomer, J., Serra, T., Cañabate, D. & Bubnys, R. (2020). Reflective learning in higher education: Active methodologies for transformative practices. *Sustainability*, *12*(9), 3827. https://doi.org/10.3390/su12093827

Cotán, A. (2016). El sentido de la investigación cualitativa [The meaning of qualitative research]. *Escuela Libre*, *19*, 33-48. https://doi.org/10.29257/EA19.2016.03

Conferencia de Rectores de las Universidades Españolas [CRUE]. (2019). *Manifiesto de CRUE Universidades Españolas por un planeta más sostenible* [Manifesto of CRUE Spanish Universities for a more sustainable planet]. https://www.crue.org/2019/12/manifiesto-de-crue-universidadesespanolas-por-un-planeta-mas-sostenible-diciembre-2019/

Cruz-Iglesias E., Gil-Molina P. & Rekalde-Rodríguez I. (2022). A navigation chart for sustainability for the *Ocean i*^{3} educational project. *Sustainability*, *14*(8), 4764. https://doi.org/10.3390/su14084764

Denzin, N. K. & Lincoln, Y. S. (2011). *The Sage handbook of qualitative research*. Sage.

Elmassah, S., Biltagy, M. & Gamal, D. (2020). Engendering sustainable development competencies in Higher Education: The case of Egypt. *Journal of Cleaner Production*, *266*, 121959. https://doi.org/10.1016/j.jclepro.2020.121959

Escámez, J. I. & López, E. (2019). La formación del profesorado universitario para la educación en la gestión de la sostenibilidad [Training university lecturers in sustainability management Education]. *PUBLICACIONES*, *49*(1), 53-62. https://doi.org/10.30827/publicaciones.v49i1.9852

Evans, T.L. (2019). Competencies and pedagogies for sustainability education: a roadmap for sustainability studies program development in colleges and universities. *Sustainability*, *11*, 5526. https://doi.org/10.3390/su11195526

Flick, U. (2014). *An introduction to qualitative research*. Sage.

Flyvbjerg, B. (2011). Case study. In N. K. Denzin & Y.S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (pp. 301-316). Sage.

Francés, F. J., Alaminos, A., Penalva, C. & Santacreu, Ó. A. (2014). *El proceso de medición de la realidad social: La investigación a través de encuestas* [The process of measuring social reality: Research through surveys]. PYDLOS editions.

Garcia-Alvarez, M., Rekalde-Rodríguez, I. & Gil-Molina, P. (2023). No transition without transformation: educating sustainability. In W. Leal Filho, M.A.P. Dinis, S. Moggi, E. Price & A. Hope (Eds). *SDGs in the European region: Implementing the UN sustainable development goals – regional perspectives* (pp. 633-667). Springer. https://doi.org/10.1007/978-3-030-91261-1_98-1

Gil-Molina, P., Cruz-Iglesias, E. & Rekalde-Rodríguez, I. (2024). Developing competences in a cross-border interdisciplinary project: student and teacher perceptions of the Ocean i3 project. *Journal of University Teaching and Learning Practice*, *21*(1), 1-26. https://doi.org/10.53761/677rfm42

Gurdián-Fernández, A. (2007). *El paradigma cualitativo en la investigación socioeducativa* [The qualitative paradigm in socio-educational research]. Agencia Española de Cooperación Internacional.

Güvercin-Seçkin, G. & Türkan, M. (2024). Transformative learning in times of crisis: exploring teachers' experiences during the COVID-19 pandemic. *Asia Pacific Education Review, 1*(1), 1-15. https://doi.org/10.1007/s12564-024-10014-1

Heumann, A. R. (2023). *Teaching for change: exploring Transformative Pedagogy in education for sustainable development* [Unpublished master's thesis]. University of Oulu.

Kaplan, A. & Sarisaltik, U. (2024). An informal and transformative learning environment: The case of ODTÜ Bostan community garden in Turkey. *Cleaner and Responsible Consumption*, *15*, 100229. https://doi.org/10.1016/j.clrc.2024.100229

Kiss, G., Lazányi, O, Taxner, T., Veress, T. & Neulinger, A. (2024). The transformation of sustainable lifestyle practices in ecoclubs. *Cleaner and Responsible Consumption*, *13*, 100189. https://doi.org/10.1016/j.clrc.2024.100189

Kleinheksel, A. J., Rockich-Winston, N., Tawfik, H. & Wyattasha T.R. (2020). Demystifying content analysis. *American Journal of Pharmaceutical Education*, *84*(1), 127-137. https://doi.org/10.5688/ajpe7113

Kvale, S. (2007). *Doing interviews*. Sage.

Lang, D. J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., Swilling, M. &Thomas, C. J. (2012). Transdisciplinary research in sustainability science: Practice, principles, and challenges. *Sustainability Science*, *7*(1), 25-43. https://doi.org/10.1007/s11625-011-0149-x

Leal Filho, W., Shiel, C. & Paço, A. (2018). Implementing and operationalising integrative approaches to sustainability in higher education: The role of project-oriented learning. *Journal of Cleaner Production*, *172*, 4007-4016. https://doi.org/10.1016/j.jclepro.2017.05.193

Lee, K.-H., Noh, J. & Khim, J.S. (2020). The Blue Economy and the United Nations' sustainable development goals: Challenges and opportunities. *Environment International*, *137*, 105528. https://doi.org/10.1016/j.envint.2020.105528

Lotz-Sisitka, H., Wals, A. E., Kronlid, D. & McGarry, D. (2015). Transformative, transgressive social learning: rethinking higher education pedagogy in times of systemic global dysfunction. *Current Opinion in Environmental Sustainability*, *16*, 73-80. https://doi.org/10.1016/j.cosust.2015.07.018

Lotz-Sisitka, H., le Grange, L. & Mphepo, G. (2024). Engaged sustainability science and place-based transgressive learning in higher education. *South African Journal of Science*, *120*(9/10), 1-7. https://doi.org/10.17159/sajs.2024/17958

Lozano, R. (2006). Incorporation and institutionalization of SD into universities: Breaking through barriers to change. *Journal of Cleaner Production*, *14*(9-11), 787–796. https://doi.org/10.1016/j.jclepro.2005.12.010

Mawonde, A. & Togo, M. (2019). Implementation of SDGs at the University of South Africa. *International Journal of Sustainability in Higher Education*, *20*(5), 932-950. https://doi.org/10.1108/IJSHE-04-2019-0156

McMillan, J.H. & Schumacher, S. (2009). *Research in education: evidence-based inquiry*. Pearson Education.

Mezirow, J. (1991). *Transformative dimensions of adult learning*. Jossey-Bass.

Mezirow, J. (2000). *Transformative theory of adult learning*. Jossey-Bass.

Michelsen, G. & Fischer, D. (2017). Sustainability and Education. In M. V. Hauff & C. Kuhnke (Eds.), *Sustainable development policy: a european perspective* (pp.135-158). Routledge.

Mori, R., Fien, J. & Horne, R. (2019). Implementing the UN SDGs in Universities: Challenges, opportunities, and lessons learned. *Sustainability*, *12*, 129-133. https://doi.org/10.1089/sus.2019.0004

Muñoz, V. & Pérez, L.E. (Eds.). (2021). *Transformative education: meanings and policy implications*. Global Campaign for Education.

Murga-Menoyo, M. A. (2015). Competencias para el desarrollo sostenible: las capacidades, actitudes y valores meta de la educación en el marco de la Agenda global post- 2015 [Competencies for sustainable development: the target capacities, attitudes and values of education within the framework of the post-2015 global agenda]. *Foro de Educación*, *13*(19), 55-83. https://doi.org/10.14516/FDE.2015.013.019.004

Odum, T. & Kordsmeier, G. (2023). Navigating the age of crisis: exploring the pathway to engaged pedagogy for the transformative learning environment. *Sociological Focus*, *57*(1), 1-5. https://doi.org/10.1080/00380237.2023.2296662

Paletta, A. & Bonoli, A. (2019). Governing the university in the perspective of the United Nations 2030 Agenda: The case of the University of Bologna. *International Journal of Sustainability in Higher Education*, *20*, 500-514. https://doi.org/10.1108/IJSHE-02-2019-0083

Pérez, E. (2022). *Global Campaign for Education: SDG4 spotlight report*. Global Campaign for Education.

Portuguez, M. & Gomez, M.G. (2020). Challenge based learning: Innovative pedagogy for sustainability through e-learning in higher education. *Sustainability*, *12*(10), 4063. https://doi.org/10.3390/su12104063

Prabawani, B., Hadi, S. P., Zen, I. S., Afrizal, T. & Purbawati, D. (2020). Education for sustainable development as diffusion of innovation of secondary school students. *Journal of Teacher Education for Sustainability*, *22*(1), 84-97. https://doi.org/10.2478/jtes-2020-0007

Prado, J. F. (2021). La educación de adultos: un acercamiento desde el aprendizaje transformacional [Adult education: an approach based on transformational learning]. *Conrado*, *17*(78), 140-144.

Rekalde-Rodríguez I., Barrenechea J. & Hernandez Y. (2021). Ocean I3. Pedagogical Innovation for Sustainability. *Education Sciences*, *11*(8), 396. https://doi.org/10.3390/educsci11080396

Rekalde-Rodríguez, I., Gil-Molina, P. & Cruz-Iglesias, E. (2023). Institutional teaching choreographies in education for sustainability in times of pandemic: the Ocean i^3 project. *International Journal of Sustainability in Higher Education, 23*(8), 39. https://doi.org/10.1108/IJSHE-02-2022-0039

Rieckmann, M. (2012). Future-oriented higher education: Which key competencies should be fostered through university teaching and learning? *Futures*, *44*(2), 127-135. https://doi.org/10.1016/j.futures.2011.09.005

Rodríguez, J.G. & Barth, M. (2020), Transformative learning in the field of sustainability: a systematic literature review (1999-2019). *International Journal of Sustainability in Higher Education*, *21*(5), 993-1013. https://doi.org/10.1108/IJSHE-05-2019-0168

Sabariego, M. (2024). *Análisis de datos cualitativos y el programa Nvivo 14. Dosier-Tutorial* [Qualitative data analysis and the Nvivo 14 programme. Dossier-Tutorial]. University of Barcelona.

Sabbah, R. (2021). Foreword by the president of global campaign for education. In V. Muñoz & L.E. Pérez (Eds.). *Transformative education: meanings and policy implications* (p. 2). Global Campaign for Education.

Servicio de Asesoramiento Educativo/Hezkuntza Laguntzarako Zerbitzua [SAE/HELAZ]. (2023). *Análisis del uso de la estrategia IKD i3 por parte del profesorado de la UPV/EHU* [Analysis of the use of the IKD i3 strategy by teaching staff at the University of the Basque Country (UPV/EHU)]. https://www.ehu.eus/documents/1870360/49693561/Analisis-del-uso-de-la-estrategia-IKDi3-por-parte-del-profesorado-de-la-UPVEHU.pdf/9b11aca3-4360-aa0f-a665-92fdc37dcc5d?t=1706091709901

Sáez de Cámara, E., Fernández, I. & Castillo-Eguskitza, N. (2021). A holistic approach to integrate and evaluate sustainable development in higher education. the case study of the university of the Basque Country. *Sustainability*, *13*(1), 392. https://doi.org/10.3390/su13010392

Schauppenlehner-Kloyber, E. & Penker, M. (2015). Managing group processes in transdisciplinary future studies: How to facilitate social learning and capacity building for self-organised action towards sustainable urban development? *Futures*, *65*, 57-71. https://doi.org/10.1016/j.futures.2014.08.012

Sibilla, M. & Kurul, E. (2020). Exploring transformative pedagogies for built environment disciplines: the case of interdisciplinarity in low carbon transition. *Building Research & Information*, *49*(2), 234-247. https://doi.org/10.1080/09613218.2020.1811076

Singer-Brodowski, M. (2023). The potential of transformative learning for sustainability transitions: moving beyond formal learning environments. *Environment, Development and Sustainability*, *27*, 20621-20639. https://doi.org/10.1007/s10668-022-02444-x

Slavich, G. M. & Zimbardo, P. G. (2012). Transformational teaching: theoretical underpinnings, basic principles, and core methods. *Educational Psychology Review*, *24*(4), 569-608. https://doi.org/10.1007/s10648-012-9199-6

Sterling, S., Dawson, J. & Warwick, P. (2018). Transforming sustainability education at the creative edge of the mainstream: a case study of Schumacher College. *Journal of Transformative Education*, *16*(4), 323-343. https://doi.org/10.1177/1541344618784375

Tilbury, D. (2011). *Education for Sustainable Development: An Expert Review of Processes and Learning*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000191442

Tracy, S. J. (2010). Qualitative Quality: Eight "Big-Tent" criteria for excellent qualitative research. *Qualitative Inquiry*, *16*(10), 837-851. https://doi.org/10.1177/1977800410383121

United Nations [UN]. (2015). *Transforming our world: the 2030 Agenda for Sustainable Development*. https://sdgs.un.org/es/goals

United Nations [UN]. (2024). *The sustainable development goals report 2024*. https://unstats.un.org/sdgs/report/2024

United Nations Educational, Scientific and Cultural Organization [UNESCO]. (2014). *UNESCO roadmap for implementing the Global Action Programme on Education for Sustainable Development*. https://unesdoc.unesco.org/ark:/48223/pf0000230514

United Nations Educational, Scientific and Cultural Organization [UNESCO]. (2017). *Education for Sustainable Development Goals: learning objectives*. https://unesdoc.unesco.org/ark:/48223/pf0000247444

United Nations Educational, Scientific and Cultural Organization[UNESCO]. (2021). *Reimagining our futures together: a new social contract for Education*. https://doi.org/10.54675/ASRB4722

United Nations Institute for Training and Research [UNITAR]. (2017). Declaration of University Global Engagement. https://www.aplu.org/our-work/5-archived-projects/international-programs/declaration-on-global-engagement/

University of the Basque Country. (2019). *EHUagenda 2030 para el Desarrollo Sostenible* [EHUagenda 2030 for Sustainable Development]. https://www.ehu.eus/documents/4736101/11938005/EHUAgenda-2030-ENG.pdf/487b2c83-51e1-d0e2-dcd1-af419b2b5c26

University of the Basque Country. (2022). *Plan Estratégico de la UPV/EHU 2022–2025* [UPV/EHU Strategic Plan 2022–2025]. https://www.ehu.eus/es/web/idazkaritza-nagusia/upv-ehuren-plan-estrategikoa-2022-2025

Zinkunegi-Goitia, O. & Rekalde-Rodríguez, I. (2022). Employability within an Education for Sustainability Framework: The Ocean i3 Case Study. *Education Sciences*, *12*(4), 277. https://doi.org/10.3390/educsci12040277