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Innovative approaches in Education for Sustainable Development: the case of the FABULA C-Plus Project

Approcci innovativi nell'educazione allo Sviluppo Sostenibile: il caso del Progetto FABULA C-Plus

di

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Abstract:

The article presents a case study dedicated to the analysis of teaching and learning resources elaborated in the scope of the FABULA C-Plus Project, developed between 2020 and 2022, through partnerships with institutions from Italy, Greece, and Spain; as well as the potentiality of these strategies to the development of competencies within the Education for Sustainable Development (ESD) context. By a content analysis that explored several materials developed in the Project it is possible to verify a convergence between the trends pointed out by UNESCO, OECD, and EC as guides to ESD, once the Project proposes the adoption of innovative educational approaches characterized by interactive, gamified, and laboratory resources to develop competences and behaviors guided to a circular economy. Some gaps regarding the topics covered are identified,

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especially regarding the absence of the problematization of social issues crossing the emerging climate and environmental challenges.

Keywords: Education for Sustainable Development; Competencies; Circular Economy; 2030 Agenda.

Abstract:

L'articolo presenta uno studio di caso dedicato all'analisi delle risorse di insegnamento e apprendimento elaborati nell'ambito del Progetto FABULA C-Plus, sviluppato tra gli anni 2020 e 2022 attraverso partnership con istituzioni dell'Italia, della Grecia e della Spagna, e il potenziale di queste strategie per lo sviluppo di competenze nel contesto della Educazione allo Sviluppo Sostenibile (ESS). Per mezzo di un'analisi di contenuto che ha esplorato diversi materiali sviluppati nel Progetto, è possibile verificare una convergenza riguardo alle tendenze indicate dall'UNESCO, dall'OCSE e dalla CE come guide per la ESS, dato che il Progetto propone l'adozione di approcci educativi innovativi, caratterizzati da risorse interattive, ludicizzate e laboratoriali per sviluppare competenze e comportamenti orientati all'economia circolare. Alcune lacune in rapporto ai temi abordati sono identificate, specialmente riguardo all'assenza di problematizzazione di questioni sociali che attraversano le sfide climatiche e ambientali emergenti.

Parole chiave: Educazione allo Sviluppo Sostenibile; Competenze; Economia Circolare; Agenda 2030.

1. Introduction

The complex challenges inscribed at a global level outcry for political, social, economic, and environmental interventions that are capable of reacting to the “polycrisis” stressed by Edgar Morin (2020). There is a human lack of recognition of the intrinsic natural condition and the improper practices present within the ecosystems that society produces and feeds (Descola, 2021).

The impulse in promoting an urgent change in lifestyles and people’s ways of thinking and acting has never been so strong (UNESCO, 2017). The reconfiguration of paradigms entailed in the men and nature relationship demands an appropriate educational response. Education is fundamental to improving people’s capacities to deal with emerging questions that are tied to sustainable development (Hopkins & McKeown, 2002).

The discussions that come up in political and academic spaces address the competencies in distinct ways, however, there is a consensus in comprehending them as a complex functionally connected with knowledge, abilities, and attitudes that enable the performance of tasks and problem-solving (Wiek et al., 2011). It is fundamental the selection of pedagogical approaches that present potential to support the development of such competencies since the search for sustainable development is dynamic and adaptive learning actions are needed (Giangrande et. al, 2019).

The latent need to reconfigure human formation patterns has been underlined by structures that guide an Education focused on sustainable challenges, elaborated by international institutions such as

United Nations Educational, Scientific and Cultural Organization (UNESCO), Organisation for Economic Co-operation and Development (OECD), and the European Commission (EC).

These organizations highlight the urge to reflect on the educative actions and strategies to be implemented since the first school years to build up behaviors oriented to sustainability. Programs engaged in promoting Education for Sustainable Development (ESD) are seen as a way to ensure a better ecological balance and social justice in production and consumption relations, which aligns with the goals set in the 2030 Agenda by United Nations (UN). Hence, the ESD is not only a prescribed body of information and knowledge but an educational goal (Hopkins, 2012).

Committed to contributing to this discussion, this article aims to analyze the didactic strategies and the learning resources explored in the scope of the FABULA C-Plus Project related to its potential in developing competencies according to the trends pointed out by UNESCO, OECD, and EC to the ESD. From that, researchers and educators are going to be able to support themselves in this study to guide practices and to develop and evaluate educational programs engaged in promoting sustainability. As well as to analyze the feasibility of appropriation of free resources related to the FABULA C-Plus project in educative interventions inserted in the ESD.

2. Development of competencies and innovative approaches in the ESS context: literature contributions

In formal education, the characteristics of a certain activity, course, or program result from what is expected that the students are capable of achieving, which includes the way the pedagogical intervention is organized, the selection of thematic contents, and the evaluation of learning (Mochizuki & Fadeeva, 2010). The competencies provide an explicit and commonly shared structure to the development of distinct and recognizable profiles in several spheres of society and a referential scheme to transparently evaluate the students learning and teaching efficiency (Wiek et al., 2011).

The ESD engages in developing competencies aimed at a new way of human thinking and acting about the world (Evans, 2019; Dal Magro et al., 2020; Aboytes & Barth, 2020). While the students learning results and academic achievements traditionally define the efficiency and the quality of educational interventions, learning experiences are the focus of strategies of formation developed in the ESD scope (OECD, 2019). Transformative learning has been discussed by several authors and international organizations as an approach with the potential to promote ESD (UNESCO, 2017; OECD, 2019; EC, 2022; Barth & Michelsen, 2013; Schneidewind et al., 2016).

To Mezirow, the author who inserted the transformative learning theory within the international academic debate, this approach consists in a process that engages in promoting a change in the human referential frameworks, from a coherent body of experiences that define lifestyles, ways of seeing the world, and actions (Mezirow, 1978). When the appropriation of a new horizon is possible, students expand their framework of references through critical reflection about the assumptions of their interpretations, values and habits, opening up themselves to new horizons of thinking and world interpretation.

Transformative learning is, therefore, a process that transforms frameworks of problematic references to make them more inclusive, discriminating, reflective, open, and emotionally capable of changing

(Mezirow, 2009). It is worth mentioning that the restructuring of framework references does not occur just through an instrumental learning method, but, mostly, through an emancipatory or reflexive learning.

In the context of transformative learning, Sipos et al. (2008) propose goals organized in domains named: head, hands, and heart; that correspond to cognitive, psychomotor, and affective dimensions, respectively. This approach considers the life story and personal experience of the participants fundamental, and it proposes deep changes in knowledge abilities and attitudes related to the rising of environmental, economic, and social justice.

Morin (2000) points to the need for rethinking educative models that work with isolated and disconnected information once there is a natural human mind disposition in situating all information in a context and a cluster. It means that it is indispensable that educative programs become capable of situating information in their contexts to promote meaning.

Pedagogical innovations are pointed out as required to advocate greater approximation with contextual factors that involve the school itself and the policies in the school environment, with the guidelines and cultural values, the attitudes, the teacher's abilities, and the student's characteristics (Owston, 2006). Innovative approaches to teaching might supply new ways of involving students with sustainability once it searches for developing abilities related to problem-solving and allows collective work to deepen content (Bergman & Sams, 2012).

In the current context, there is a latent need of reflecting and questioning assumptions and values that are related to unbearable emerging production and consumption patterns. So, transformative competencies and innovative pedagogical approaches to teaching are highlighted by their potential contribution to engaging students against emerging challenges and current times complexities.

3. Methodology

This research is based on a case study characterized by the FABULA C-PLUS Project; a program that stimulates the circular economy developed for 9- to 11-year-old children. Thus, this research aims to answer the following research question: Do teaching resources and strategies elaborated in the scope of the FABULA C-PLUS Project present potential to develop competencies that converge with the guidelines elaborated by UNESCO, OECD, and EC to ESD?

The study's approach is qualitative and is inscribed in the interpretive paradigm (Creswell, 2003; Flick, 2015). I organized a documental research into two steps. The first consisted in exploring three documents developed by UNESCO, OECD, and EC; named Education for Sustainable Development Goals: learning objectives (2017), Learning Compass (2019), and GreenComp (2022), respectively. From these guides, I could identify the pedagogical competencies and approaches with greater potential of guiding educative interventions that focused on sustainability.

From this mapping that enabled the elaboration of the analysis criteria, this study sought to explore the convergence of the didactic strategies and the learning resources that involved the educative interventions in the FABULA C-Plus project. It took place from the priorities pointed out by the guides about the appropriation of innovative pedagogical approaches and the development of transformative competencies of sustainability. The documents linked to the project that were analyzed

were: virtual tours, the teacher's and student's manual, the study course, the games, the modules with nine didactic units, the videos, and the animations used in the program.

The steps involved in this study can be seen in Figure 1:

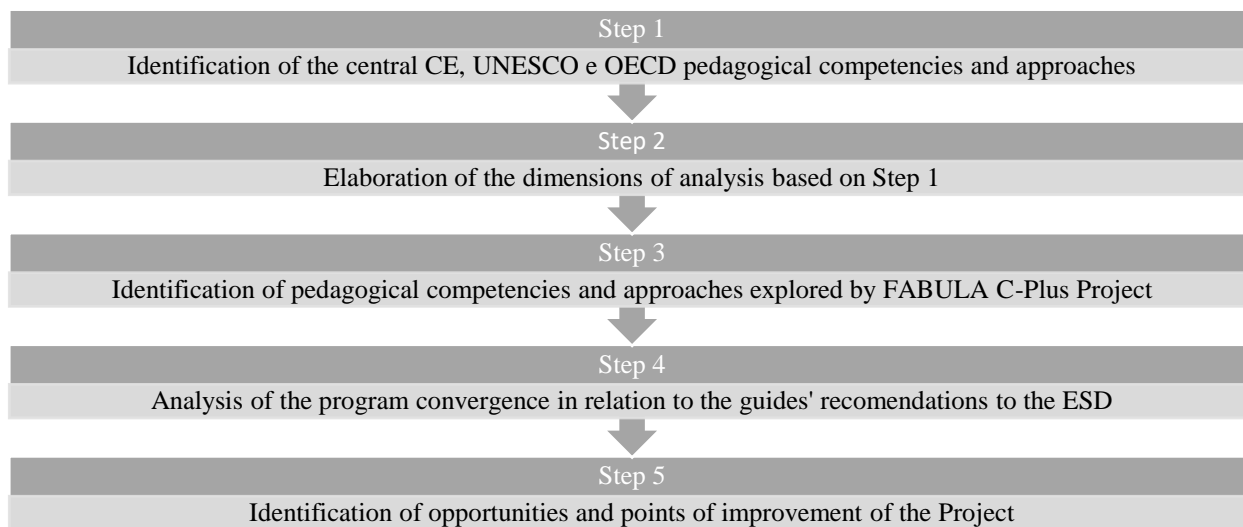


Figure 1: Research steps

This study intends to contribute to current literature and educational practices aimed at sustainability through the analysis of opportunities and the possibilities of improvement of a project applicable in formative contexts and gathering the most current orientations that guide the ESD.

4. Main findings and analysis

This section discusses the main findings obtained from data analysis.

4.1 Main competencies of ESD explored in the guides

The different guides elaborated in the last years to orient the ESD contemplate a repertoire of competencies to face the emerging challenges that involve sustainability. The competencies pointed out as essentials by these frameworks are seventeen, and together they form the foundation that UNESCO, OECD, and EC understand as being the most needed ones to promote ESD. Specifically, on what refers to Learning Compass, although the document quotes only three transformative competencies as central, this analysis included other transversal dimensions that were emphasized throughout the document as relevant to ESD.

In Figure 2 it is possible to observe the competencies pointed out by the guides as essentials to promote a type of learning aimed at sustainability. In particular, regarding the competencies that were concomitantly mentioned in the guides, a few adaptations in their nomenclature were made to be possible to cluster and graphically represent them through a Venn diagram. In the image below, it is

possible to identify the competencies that are common in the documents and which ones are isolated and pointed out by the guides, which enabled a comparative analysis from the production of analogies and the observation of differences.

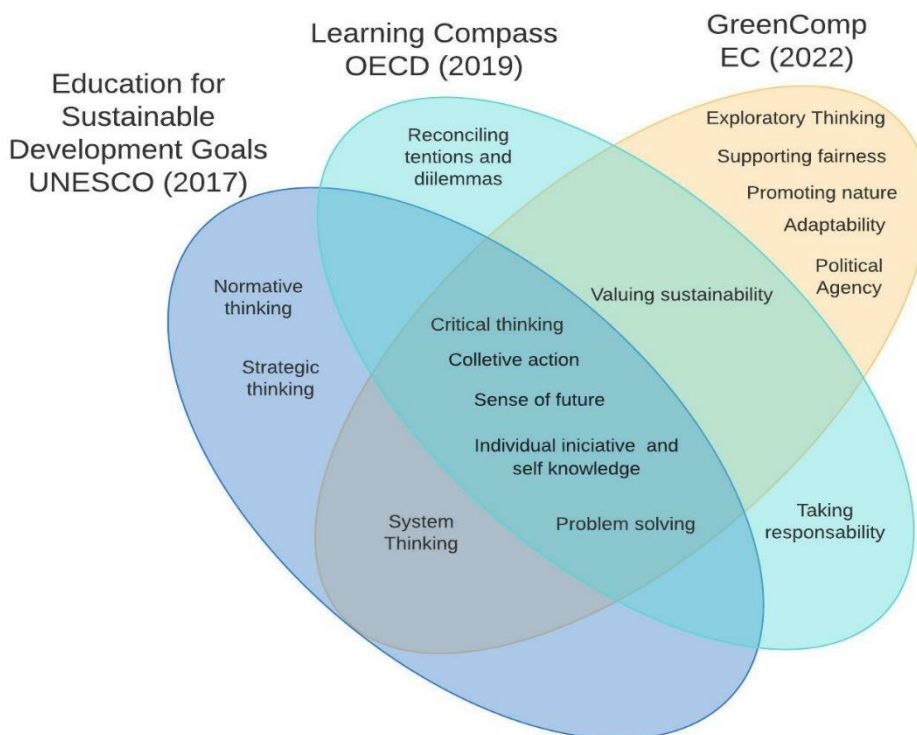


Figure 2: Key competencies elected by UNESCO (2017), OECD (2018), and EC (2022) to guide the ESD

It is possible to observe that all of the guides refer to the student's capacity of critically thinking, of acting responsibly, of having a sense of future, and solving problems; which formed a common core represented by the intersection of the three sets. These competencies get closer to the transformative learning theory principles, which aim to transform the framework of references of students towards reflection, criticism, and action, besides focusing on changing and problem-solving.

The competencies mentioned by one or two guides are deeply interchangeable with the ones that are indicated by all the documents. All of these competencies converge at some level to the formation of more critical and aware of current challenges students, engaged in undertaking meaningful actions to mitigate such problems.

Yet, it is worth stressing that the competencies mentioned by all of the analyzed guides point to a strong link between the individual and social dimensions and the relevance of competencies that foster individual action as well as the collective one. Once the current challenges that englobe problematic questions related to environment, economy, politics, and social justice need collective actions engaged in promoting more sustainable practices that are born at the core of individual awareness and attitude.

It is relevant to underline that to each competence indicated by the guides, there is a set of corresponding knowledge, abilities, values, and attitudes that are directly linked to the learning goals traced in the scope of educative interventions. Beyond this, it is possible to note that there are competencies that are oriented both to the reflection and to the action, which enable to students reconsider their ways of comprehending and acting toward the defined competencies of each activity or program aimed at ESD.

4.2 Pedagogical approaches and resources indicated by the guides

In the analyzed guides, there is an expressive concern in associating innovative learning approaches with the development of competencies in the context of ESD. Overall, the documents point out the importance of collaborative, and interdisciplinary and transdisciplinary work, including, for instance, approaches aimed at work with projects, problem-solving, or community practices. To sum up, the guides indicate a potentiality of pedagogical approaches oriented to action and transformative learning, in a way that the intervention enables the student to be able to produce changes in the environment they live in.

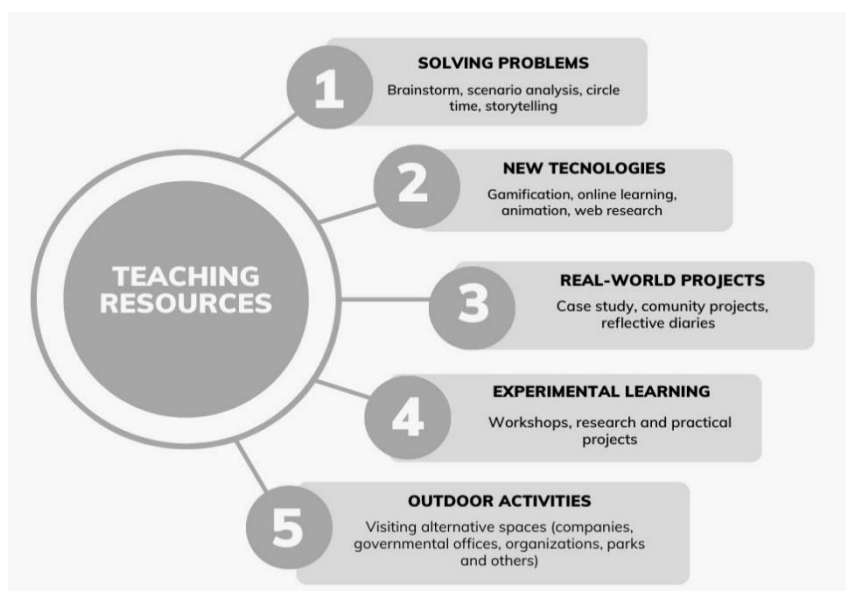


Figure 3: Pedagogical resources with the potential to promote ESD

Transformative learning, in turn, is not defined by one or more educative strategies, but it is largely more aligned with goals and principles engaged in shifting the world's perceptions. The documents proclaim that, in this approach, there is a reflection related to the *status quo* and unbearable standards of production and consumption. It is worth noting that, in the context of these approaches some pedagogical practices are quoted by documents as potential interventions in the scope of the ESD, as can be seen in Figure 3.

The EC (2022) mentions learning contexts that are based on gamification, dramatization, experimental games, study cases, combined and online learning, approaches in open areas, and collaboratives. UNESCO (2017) highlights the importance of inserting students in real-world

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projects, in exercises to build up views, such as workshops for the future, scenario analysis, storytelling, research projects based on the community, system games, and reflective diaries.

OECD (2019) indicates the appropriation of hands-on and immersive pedagogies, so students have the opportunity of involving themselves in experimental learning that reflects their interests, such as participation in community projects. Despite this, they point out study cases and learning based on projects as other possibilities to promote ESD.

4.3 FABULA C-Plus Project Analysis

The FABULA C-Plus project was elaborated from the original initiative “FABULA – Financial And Business Learning Activities Game” committed to exploring the edutainment logic, which means, educating while having fun to involve children with themes related to entrepreneurship and financial literacy. Then, the C-Plus version of the project is a result of an expansion of a range of actions from the original program, which sought to explore innovative ways of teaching to develop knowledge and the capacity to adopt behaviors oriented to a circular economy among students in European countries. Co-sponsored by EC and developed through international partnerships, the FABULA C-PLUS Project had its testing phase between 2020 and 2022, involving 154 students in Italy, Spain, and Greece.

Regarding edutainment, it is important to point out that the appropriation of this dynamic by the Project is characterized in a way it converges with the concept written by Singhal & Rogers (1999), by appropriating entertainment elements in educational interventions that have great potential in promoting social changes. Thus, entertainment is seen as an element to make learning pleasant, and, in this context, it was used as a strategy to motivate and engage children to assume behaviors guided by the circular economy. The children are also stimulated to develop an early view of the possibilities related to the reuse of resources and materials (Conform, 2020b). Edutainment is, then, seen in the scope of this project as the movement that, simultaneously, educates and entertains, a resource that shows itself converging with the nature of the public to which the initiative is directed to.

The criteria adopted for analysis emerged from the identification of competencies steps and the pedagogical approaches developed in sections 4.1 and 4.2 and are present in Figure 4. The parts highlighted in gray correspond to the dimensions addressed in the educative interventions while the white color represents those that the Project did not contemplate.

	Competencies Developed														Teaching Resources								Learning Dimension													
Teaching Unities	Normative thinking	Strategic Thinking	System Thinking	Critical Thinking	Collective Action	Sense of Future	Individual Initiative and Self Knowledge	Problem-Solving	Reconciling tensions and dilemmas	Valuing Sustainability	Taking Responsibility	Exploratory Thinking	Supporting Fairness	Promoting Nature	Adaptability	Political Agency	Problemization	Brainstorm	Games	Dramatization	Experimentation	Animation and Storytelling	Case Study	Outdoor activity	Visits to alternative learning spaces	Workshops	Activities with community	Cognitive	Socioemotional	Behavioral						
1.1																																				
2.1																																				
2.2																																				
2.3																																				
2.4																																				
2.5																																				
2.6																																				
2.7																																				
3.1																																				

Figure 4: Dimensions addressed by the Project

The analysis related to the representation of the dimensions addressed by the Project displayed in Figure 4 is explored in the following sections.

4.3.1 Competencies developed by the Project

The competencies that go through each of the teaching units aim to evolve human capacities committed to the transition to sustainable societies, through awareness, reflection, and actions directed to transforming patterns, which includes the student’s self-awareness and their relationship with others and with nature. Regarding the competencies that were concomitantly recognized by UNESCO, OECD, and EC as potentialities to promote ESD, it is possible to verify that the FABULA C-Plus Project explores them deeply. All the didactic units incorporated activities that somehow contemplated the competencies of critical thinking, collective action, sense of future, individual initiative, self-knowledge, and problem-solving. Another competence present in all the teaching units analyzed is valuing sustainability, recognized by Learning Compass and Greencomp as relevant to promote awareness and developing responsible actions. The adaptability and promoting nature competencies, whose importance is underlined by EC, are also present in the learning goals in all the didactic units and reveal their potential to the accomplishment of sustainable practices and concrete effects of human action towards the environment. Strategic, exploratory, and system thinking are seen

by UNESCO as important competencies to ESD and are present in the majority of units, which also indicates the relevance given to these competencies by the Project's founders. These are competencies oriented to reflection, anticipation, and problem-solving that are useful for planning actions directed toward sustainability. The concern in developing the reconciling tensions and dilemmas competence, which is part of the OECD's guiding set, was little explored by the Program and was addressed in only two out of nine didactic units. It represents a point that deserves improvement, once such competence involves the reading and understanding of complex and ambiguous contexts, cognitive flexibility, and abilities for perspective-taking so that problematic questions can be seen from different viewpoints (OECD, 2019). This is particularly important to contexts that seek to promote sustainability, once it is a competence that can only be reached out through socioemotional and behavioral abilities related to empathy and respect. Equity and social justice were explored only once and very briefly and superficially in the food's thematic unit. Important potential reflections ended up not being explored, for example, starvation and the implications of such a problem to people and to communities that face it. It is worth highlighting that at any other unit of the Project the competencies regarding equity and social justice were explored. This limitation also calls attention since it is about a competence that exerts reflections regarding notions of humanity, solidarity, and dignity, essential dimensions to achieve the Sustainable Development Goals (SDGs).

Activities that promote a critical sense of realities such as the unfair burden distribution of anthropogenic actions and environmental impacts, and the discussion of dimensions that englobe energetic justice and social inequality are themes that could permeate reflexive activities transversally throughout all units. Another point of improvement identified in the competencies dimensions refers to political agency, contemplated in only one teaching unit expected in the program.

Critical awareness that involves citizenship is affected by the political agency approach, understood as the capacity to positively influence the collective future and mobilize those who are at the political level to act for change. Hence, educative interventions that promote critical awareness, the ability to analyze the context, reflect on ways to move forward in certain themes, and identify who is accountable are essential to prepare children for full citizenship and their engagement with sustainable questions. This gap dialogues with another competence that was not explored in any units, which is normative thinking. Not exploring this dimension also means not problematizing how the *status quo* and the norms influence premises and economic, social, and environmental practices, especially in the political domain. This is particularly relevant so that students start questioning norms and values that basis people's actions and the way it influences the negotiation of values, principles, objectives, and sustainable goals, inserted in a context of conflict of interests and concessions, uncertain knowledge, contradictions, and subjacent normative to them.

4.3.2 Pedagogical approaches and Didactic Resources used in the Project

The methodological guidance used and suggested to the teacher in the scope of the FABULA C-Plus Project is a mixed approach, in a way it blends traditional aspects and dialogues about the process in the educative interventions. Regarding the traditional approach, the manual defines its appropriation using practices as "(...) characterized by frontal classes, cultivated through brainstorming, circle time". Although the document indicates the use of this approach, which at first sight might seem far

from the ESS guides recommendations, the analyses demonstrate that traditional educative paths were not followed disconnectedly from the didactic interventions centered on the student, action, and transformation. Hence, there is no direct practical correspondence to the conception of traditional teaching as a whole, once interventions characterized by a more transmissive attitude from the teacher were specific and generally located in the initial intervention of each unit, to inform, explain, or “instill in the children a diachronic and environmental awareness, a feeling of accountability and care” (Conform, 2020a, p. 3).

The analysis demonstrated the predominance presence of a dialogical approach, many of the times followed by ludo-temporal interventions “through manipulative activities, open educational resources, and storytelling in the cartoons proposed” (Conform, 2020a, p. 3). Thus, it becomes visible that the blending of approaches converges to the orientations produced from the ESS’ guides, once the fostering of a critical sense about the cycle of life of material and the notion of time itself involved, sought to stimulate reflection and guide students’ behavior to caring about things and to the respect the environment.

The guidelines for the teacher orient that, at the beginning of the unit, there is a movement of dialogue in which social experiences and previous conceptions of the world can be identified and considered, seeking to not only comprehend their initial frameworks of references but above all to adjust pedagogical interventions in a way that the learning experience becomes meaningful. Therefore, each unit worries about bringing closer the social live path of students so, when it makes sense, the knowledge can result in abilities and attitudes that orient autonomy in their personal and school life, as well as their actions in society.

To illustrate, in Unit 2.2, focused on wood use and its destination, the teacher’s manual orients exploring the local context, seeking to comprehend students’ previous understandings regarding artifacts and objects that students recognize and are made of this material, as well as the work of the carpenter and the art of carpentry. At the Sour Orsula Benincasa Institute, the school that developed the project in Italy, students may be led to reflect on what they already know from their social perception and the laboratory experiences dedicated to the restoration of the local cultural heritage inside the school. After the interventions, teachers are oriented to promote tours to this space, including undertaking a practical workshop that used recycled wood so that new meanings can emerge in the reconfiguration of students’ frameworks of references.

Practical workshops were resources significantly used and were present in six out of the nine units analyzed. The workshops focused on teaching how to give a “second life” or another destiny to materials that would be disposed of, materials such as oil, wood, paper, clothes, and food. It was also constant didactic interventions that were appropriated from activities in open areas, initiatives that involved the community, and tours to alternative spaces for learning, which was present in seven out of the nine units explored. These initiatives involved tours around the schoolyard and the neighborhood, tours to workshops of mechanic or carpentry, to places that practiced composting, to the Department of Environmental Protection, among other spaces.

Current literature highlights the importance of experiment resources in the scope of ESD, in a way that educational models of this nature are capable of stimulating the development of sustainable

competencies, most of the times related to learning directed to projects and practical workshops, which means, associating theoretical knowledge with practical application (Albareda-Tiana et. al., 2018; Redondo & Ladage, 2022). Concerning didactic resources, it was possible to verify that the teaching goals support themselves in the problematization of topics by teachers and brainstorming, particularly in the initial approaches, which were common to all units. Cartoons and storytelling were resources also regularly used in interventions, mainly explored through videos that fitted the edutainment logic and that sought, through both a fictional or a real case, to stimulate reflection regarding the materials and possibilities for more rational usage. It is important mentioning that the games were explored deeply in the last teaching unit, which is exclusively dedicated to the set of contents explored in previous units. The resources can be framed in the scope of “serious games”, characterized as real games that were elaborated to increase awareness about topics related to circular economy. According to Dörner et al. (2016), serious games are defined as playful activities that can take place in the context of a simulated reality, in which participants act according to rules to achieve a goal.

In the scope of the FABULA C-Plus Project, gamified resources can be framed as serious games. In the platform, the child was instructed to make conscious choices that converged with the principles of circular economy to move to the next phase, or to reach more points.

Beyond games, online tours were present mainly in the last unit (see Figure 5), thanks to the interactive and gamified platform. They also showed themselves as meaningful because they simulated real spaces in which the student is encouraged to exert transferable abilities that were explored in previous teaching units.



Figure 5: FABULA C-Plus Project's interactive and gamified platform

The platform enables digital interaction in learning through access to teaching-learning resources. 360° Online tours are done intuitively from computers and mobiles that allow virtual visits to daily common places (house, park, school, drugstore). In these spaces, there is a possibility of accessing additional information and educational resources in an online environment, among which animations, videos, documents, links to websites, and games are highlighted. Teaching-learning resources are freely accessed.

Although there is an online version, in the context of didactic-playful learning, the initiative also developed games outside the virtual environment, such as the Circle Game, aiming the practice of the target-abilities, as well as to evaluate the results obtained in learning. In this game, students do not participate only as players, but they build and set up the board, the pieces, the cards, and the package, in which the majority of materials are derived from reusable waste.

It is important to point out that the documents created by UNESCO, OECD, and EC mentioned the technologies of information as promising resources to be applied to education in the proposal of innovative alternatives, once there is evidence that, by combining theory and practice, these technologies can stimulate critical thinking (Howard et. al., 2021).

Inserted in this context, gamification is frequently used to promote behaviors directed toward sustainability (Douglas & Brauer, 2021). Some current studies show, even, the potential of apps that use gamified elements to foster people's engagement in contrast with other strategies that are restricted to simple sharing of information, since they have been shown as promising in causing changes in behavior (Beck et. at., 2019; Lieberoth et. al., 2018).

The effort in promoting the transference of abilities, especially through technological resources, is seen with concern in the learning goals present in the project. It happens once all units sought to promote opportunities to make students, in a practical way, exert competencies such as problem-solving and critical thinking, dimensions that were the base of the transformative competencies and could be transferred to other contexts.

It was possible to observe that the learning goals of all didactic units converged to elements that characterized transformative learning, by contributing to the development of human values, with the expansions of the worldview and self-knowledge through perceptions and experiences that aimed at activating knowledge, feeling, and acting to the full evolution of the individual.

5. Conclusions

The FABULA C-Plus Project was created at the core of the huge challenge of bringing closer complex concepts and reflections that involved sustainability to children's realities. It contributes to reaching the SDGs, which underline the need of developing responsible behaviors towards the environment for people of all ages. By appropriating playful, laboratorial, and gamified resources, the program seeks to develop the capacity to reflect and orient actions in alliance with circular economy dimensions, from an entrepreneur's vision in the domain of reusing and recycling resources and materials. This analysis acknowledges the initiative's potential to inform, raise awareness, and develop students' competencies about the importance of circular economy in contrast with the linear logic, to enable "a second life" to different disposal materials. To an extent that educative interventions focus on cognitive, socioemotional, and behavioral dimensions that the guides of ESS point out as fundamental when reaching SDGs.

The project presents itself as an educative framework permanently recommended to be applied and adjusted to other contexts and territories that search for solutions when developing competencies of sustainability in elementary school.

The results obtained from the analysis are systematized in Figure 6, that contemplates the FABULA C-PLUS Project's strengths and weaknesses regarding its potential in developing competencies

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directed to sustainability, as well as innovative approaches explored in the initiative. It is possible to observe that, among the teaching-learning resources quoted by UNESCO, OECD, and EC as most important to conduct the ESD, the FABULA C-PLUS contemplates multiple possibilities inserted in contexts of innovative approaches, largely oriented to reflection and to action. There is an emphasis on the potential of these resources in developing reflections and awakening critical thinking through activities designed beyond the school's environment, such as enabling contact with organizations that undertake sustainable businesses or government agencies that deal with questions related to the topic. The alternation and plurality of these didactic actions in the classroom, that contemplate initiatives based on games, laboratories, and e-learning enable the development of creativity and entrepreneurial behavior in searching for solutions that involve the circular economy. Furthermore, the didactic unit programs involved the relationship between disciplines transversally, with a clear appraisal of teamwork when searching for collective solutions to emerging issues. Overall, the learning path contemplates multiple possibilities of innovative didactic and pedagogical resources, oriented to reflection and action, in alliance with the main guides for ESD recommendations. The competencies that the teaching programs seek to develop, address the goals traced by international organizations and satisfactorily contemplate dimensions such as critical and strategic thinking, valuing sustainability and nature, sense of future and responsibility, and individual and collective agency

Competences developed from teaching and learning resources		Innovative approaches explored	
Strengths	Weaknesses	Strengths	Weaknesses
<ul style="list-style-type: none"> - Strategic Thinking - System Thinking - Critical Thinking - Collective Action - Sense of Future - Individual Initiative/ Self Knowledge - Problem Solving - Reconciling tensions and dilemmas - Valuing Sustainability - Taking Responsibility - Exploratory Thinking - Promoting Nature - Adaptability 	<ul style="list-style-type: none"> - Normative thinking - Supporting Fairness - Political Agency 	<ul style="list-style-type: none"> - Problematization - Games - Experimentation - Animation and Storytelling - Case Study - Brainstorm - Visits to alternative learning spaces - Workshops - Outdoor activity - Activities with the community 	<ul style="list-style-type: none"> - Dramatization

Figure 6: Project's results regarding the potential in developing competencies and using innovative teaching resources in alliance with ESD

As can be seen in Figure 6, although the project walks on the expected paths for an education that faces emerging challenges, some gaps call for attention, so those who are possibly interested in applying the project can observe and look for developing adjustments. The gaps identified referred mainly to the capacity of stimulating students within the equity and social justice dimension. Educative interventions could appropriate more resources that would develop a critical sense of discrepant scenarios in the realities of European countries, like the ones that characterized economic, social, energy, and environmental issues that the global South faces, to confront these dilemmas as a global challenge.

All the competencies that, to some extent, ended up not being addressed in the Project's teaching units dialogue among them. The competence of defending equity and justice is related to the political agency, for instance. It happens since, without a great level of critical sense of these questions that interact with human dignity or with an unfair distribution of environmental impacts, the impulse of demanding and publicly supporting the development and integration of policies that are capable of promoting actions is impaired, as well as initiatives that can contribute to mitigating these vulnerabilities become limited.

Competencies that stimulate the student to collaborate with others to influence change in the distribution of resources in communities, awareness about the extremes of poverty and wealth, and the incentive for dialogue about possible solutions to these problems are some paths that the Project can pursue to contribute to overcoming these challenges. Besides the evident correspondence between the equity defense and political agency competencies, the lack of strategies to develop the normative competence also adds up to this set of dimensions that deserve improvement.

The comprehension of complex issues is, mostly, due to normative suppositions and this involves the way how political decisions are interpreted by people. Thus, normative practices subjacent to economic and social issues deserve to be figured as objects of reflection and questioning of social, political, and ethical dimensions, in a way that the awareness about norms and values that sustain human actions become understood within a context of tensions, dilemmas, and contradictions.

This study adopts as its goal the ambition of contributing to the outreach of the SDGs through education, seen as a goal in itself while as a way to achieve all other UN goals. It is worth underlining that the research did not encompass evaluating the real outcomes that the set of activities developed produced on the students' knowledge, abilities, and attitudes; neither considered the coherence or quality of the faculty intervention in the context in which the FABULA C-Plus Project was applied, which configures opportunities for future studies. On the contrary, this article sought to analyze educative resources and corresponding guidelines of application, as well as the conducting and acting guiding documents for teachers to reach the learning goals. This demonstrates itself particularly relevant so that teaching institutions and faculties members get interested in reproducing the Project in their contexts can have the potential dimension and possibilities of improvement that were demonstrated throughout this study.

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