

# Curricular Practices Towards Sustainability and a Transformative Pedagogy

## Práticas Curriculares Hacia la Sostenibilidad y una Pedagogía Transformadora

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### KEYWORDS:

SDG  
 Education  
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### ABSTRACT:

In the 21st century, international organizations such as the United Nations and UNESCO have been pointing out the education role in the development of competencies to live in line with the sustainability and the objectives of the 2030 Agenda. The pedagogical/curricular practices aligned with a transformative pedagogy that mobilizes the agency power of the students constitute adequate procedures for the sustainability and the development of the objectives of the 2030 Agenda. Through a questionnaire, a study collected data from the pedagogical/curricular practices of 20 teachers from six countries, Denmark, Cyprus, Portugal, Italy, Latvia, and the Republic of North Macedonia, who belong to a European project aiming for sustainability and the development of skills. The analysis of the practices planned and developed by these teachers revealed that critical thinking was one of the most developed skills in the students. Although teachers valued the learning aspects of social issues and the strategies that lead to reflective questioning, the students' agency power was underestimated. Therefore, considering that these practices were stimulated by belonging to a project, the study showed the need to continue projects that, based on a transformative pedagogy, encourage teachers to value pedagogical/curricular practices that develop the agency power of students.

### DESCRIPTORES:

ODS  
 Educación  
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### RESUMEN:

En el siglo XXI, organismos internacionales como las Naciones Unidas y la UNESCO señalan el papel de la educación en el desarrollo de competencias para vivir en línea con la sostenibilidad y los objetivos de la Agenda 2030. Las prácticas pedagógicas/curriculares, alineadas con una pedagogía transformadora que moviliza el poder de agencia de los estudiantes, constituyen procedimientos adecuados para la sostenibilidad y el desarrollo de estos objetivos. A través de un cuestionario, se recogieron datos sobre las prácticas pedagógicas/curriculares de 20 profesores de Dinamarca, Chipre, Portugal, Italia, Letonia y la República de Macedonia del Norte, que pertenecen a un proyecto europeo orientado a la sostenibilidad y el desarrollo de competencias. El análisis de las prácticas reveló que el pensamiento crítico fue una de las competencias más desarrolladas. Aunque los profesores valoraron los aspectos de aprendizaje de los temas sociales y las estrategias que conducen al cuestionamiento reflexivo, se subestimó el poder de agencia de los estudiantes. Considerando que estas prácticas fueron estimuladas por la pertenencia a un proyecto, el estudio mostró la necesidad de continuar proyectos basados en una pedagogía transformadora que alienten a los docentes a valorar prácticas pedagógicas/curriculares que desarrollen el poder de agencia de los estudiantes.

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## 1. Introduction

In the 21<sup>st</sup>-century, the United Nations (UN) alerted the world to the need to pay attention between 2000 and 2015 to what was called the “Millennium Development Goals”. The seventh of the eight goals focused on the intention to “ensure environmental sustainability” establishes four targets towards the worldwide integration of the principles of sustainable development, guaranteeing conditions to improve people’s health, living settings, safety requirements, and other social, economic, and environmental necessities (UN, 2015).

In September 2015, representatives of the 193 UN Member States, meeting in New York, adopted the document *Transforming our World: The 2030 Agenda for Sustainable Development* as a guide for the actions to be taken by the international community until 2030. This agenda, as stated in its presentation, “is a plan of action for people, planet and prosperity (...) to take the bold and transformative steps which are urgently needed to shift the world onto a sustainable and resilient path” (UN, 2015, p. 1). As can be inferred, this document clearly expresses the intention that the actions to be developed produce changes in the sustainability of the local environment and the world, and not just the acquisition of knowledge about how to preserve it.

For the 2030 Agenda, 17 sustainable development goals (SDG) were established, which intend to allow the construction of a collective journey where no one is left behind, i.e., there is an intention of serving all students and contributing to the progress of all. From these goals, SDG 4, “Quality Education”, is considered a basic requirement to fulfill all of the other 2030 Agenda goals, understanding that quality education involves creating situations in which teachers and students, by using their “agency” power (Biesta, 2003; Priestley et al., 2013, 2015a, 2015b), can experience interventions that are in line with sustainability.

It is within the framework of the commitments arising from the 2030 Agenda that the education systems of several countries have come to recognize the need to prepare students for the 21<sup>st</sup>-century experience, conveying proposals for education for sustainable development (EDS), that is, an education that “aims to produce learning outcomes that include essential skills such as critical and systems thinking, collaborative decision-making and responsibility for the present and future generations” (Leicht et al., 2018, p. 7).

As can be understood, an education guided by this intention implies that teachers have an active role in the processes of curriculum configuration and engage in pedagogical/curricular practices that enable students to intervene in the environment and the world’s sustainability, simultaneously awakening the desire to contribute to positive transformations. In line with this idea, it is expected that students can examine critically their beliefs, values, and knowledge to develop a reflective knowledge base, an appreciation for multiple perspectives, and a sense of critical consciousness and agency (Ukpokodu, 2009).

The proposal for these pedagogical/curricular practices is associated with the concept of “agency” (Priestley et al., 2013, 2015a, 2015b), valuing situations in which teachers and students act as decision agents for a positive transformation; that is, it fits into what is designated as a transformative pedagogy. It is in this orientation that the pedagogical/curricular practices favor critical thinking, autonomy, reflection, sharing, and creativity in finding solutions. However, for them to be present in school contexts,

pedagogical and curricular projects need to be in line with the 2030 Agenda and 21<sup>st</sup>-century competencies, which may involve teachers and students in collective work.

With these ideas as a reference, a project was developed, entitled 21C-SDG, with the objective to increase competencies in pupils, between 10 and 15 years old, related to the UN's SDG framework. It was established that the pedagogical/curricular practices planned and implemented by teachers would aim to provide conditions for students to develop the following six skills: character; citizenship; collaboration and teamwork; communication; critical thinking and problem-solving; creativity and imagination (Fullan & Langworthy, 2014).

This project involved students and teachers from six countries: Portugal, Cyprus, Latvia, Italy, the Republic of North Macedonia, and Denmark. Of the 17 SDGs established for the 21<sup>st</sup>-century, the following six were focused on: gender equality (SDG5), sustainable cities and communities (SDG11), responsible consumption and production (SDG12), climate action (SDG13), quality education (SDG4), and life below water (SDG14). Using data from the teachers that participated in this project relating to pedagogical/curricular practices planned and implemented by them in their classes, the study referred to in this article was performed to answer the following research questions:

- What 21<sup>st</sup>-century competencies do teachers consider students have developed through the pedagogical/curricular practices of the 21C-SDG project?
- What characteristics of these pedagogical/curricular activities are in line with a transformative pedagogy?
- What importance can international projects have in achieving long-term pedagogical/curricular practices, in line with the 21<sup>st</sup>-century competencies towards a transformative pedagogy?

Data were collected through a questionnaire applied to teachers from the six countries involved in the project and it was interpreted using the theoretical framework that is presented in the following point.

## 2. Theoretical framework

Ensuring quality education and promoting opportunities for all is essential to the acquisition of 21<sup>st</sup>-century competencies. Scholars such as David Orr (2004) argue that the “problem of sustainability” is also “the problem of education” (p. 27) because education requires rethinking, from individual and nation-building emphases, to focusing on the critical issues of human survival. In this same sense, Sterling and others (2018, p. 324) pointed out that education for sustainability “seeks to nurture transformative learning experiences that can heal, empower, energize, and liberate the potential for the common good”. However, these last authors recalled that transformative education and transformative learning experiences are only possible when teachers and students have lived experiences of transformative processes. It was also with a basis on this idea that the study referred to in this article was developed, with the aim, among other aspects, of ascertaining what experiences of a transformative pedagogy were provided to students involved in a project related to sustainability.

From a theoretical point of view, the project followed the perspective that developing pedagogical/curricular practices in line with education for sustainable development

(ESD) allows students to mobilize competencies such as critical and systemic thinking, communication, collaborative decision-making, and citizenship, that is, skills to which Fullan and Langworthy (2014) referred to when they proposed the New Pedagogies for Deep Learning project. According to Rieckmann (2018), ESD allows individuals to gain knowledge of the SDGs and also to develop key competencies so that they can contribute to the transformation of society into a more sustainable one. Therefore, ESD is oriented not only toward obtaining knowledge but also to interventions that contribute to the positive transformation of the environment, which contributes to a society that offers good conditions for all. Leicht and others (2018) consider that, when ESD is organized in the sense of holistic and transformational education, it enables individuals to develop competencies that promote reflection on their actions and their corresponding present and future impact.

Consequently, in this curricular orientation, in which one learns to live in and for sustainability, it is necessary to go beyond pedagogical/curricular practices where decision-making is focused on teachers (Crowley & Moxon, 2018; Leite et al., 2018, 2019; Torres-Harding et al., 2018). On the contrary, by focusing on students' learning, this guideline foresees that they are also decision-makers (Santos & Leite, 2020). As can be inferred, in this sense, ESD is associated with a transformative pedagogy.

Based on these ideas, it is also worth considering Moyer and Sinclair's (2020) research. They looked for the relationship that exists between learning, action, and transformation, from the perspective of sustainability, in 26 studies, covering about 20 years. They concluded that there were several cases of instrumental learning outcomes which provide information for action, but few that correspond to a personal transformation. In a similar vein, Gaard and others (2017) carried out a study that assessed the extent to which a curriculum focused on sustainability followed transformative rather than transmissivity approaches. They identified difficulties related, among others, to curricula that did not make it clear what they intended in terms of sustainability or that favored an organization by disciplines and not by interdisciplinary logic. Before these studies, Wiek and others (2011), in an article that presents the results of a broad literature review focused on key competencies in sustainability, also addressed critical gaps in its conceptualization pointing out this importance for the organization of academic programs and teacher training. As they state, sustainability education "should enable students to analyze and solve sustainability problems, to anticipate and prepare for future sustainability challenges, as well as to create and seize opportunities for sustainability" (p. 204). It is due to this position that these authors consider that intervening for sustainability requires mastery of a set of interdependent key competencies. As per Rosa and Malacarne (2016), it is also necessary that teachers have scientific knowledge and skills to provide their students with conditions to understand the human being and the environment in which they live. Furthermore, they add that the more clarity the teacher has about sustainable development, the more he or she can contribute to changing attitudes towards the interaction of man and nature.

Embracing these ideas, it is justified to consider that the existence of pedagogical/curricular projects and movements pointing towards actions that mobilize individual interventions and have a social impact are important. In the same line of thought, according to Martínez Bonafé and Rogero Anaya (2021), a transforming innovation is impossible without taking into account the socio-cultural environment in which it is proposed and developed. However, as mentioned above, the study developed by Gaard and others (2017) identified difficulties in implementing curriculum-related sustainability in which there are institutional impediments to

working in an interdisciplinary approach through a disciplinary-based curriculum and in which the conceptions of the pedagogy of sustainability are of contents to be transmitted rather than competence for transformation. Therefore, it is important to consider Northouse's (2016) position when he points out the advantages resulting from transformational school leadership. School leaders play an important role in institutionalizing a school culture focused on the promotion of learning and the collaborative work of teachers (Hargreaves & Fink, 2004). Maybe that is why, at the end of the 20<sup>th</sup>-century, the International Commission on Education for the 21<sup>st</sup>-century (Delors et al., 1996) supported its report on learning and not knowledge. From this perspective, it was proposed that education in this new century must be organized around four pillars: learning to know, that is acquiring the instruments of understanding; learning to do, being able to act creatively in one's environment; learning to live together, to participate and cooperate with other people in all human activities; and learning to be, an essential progression which proceeds from the previous three pillars. As mentioned by Reynolds and others (2017), this report was a milestone in the history of education, and its projection into the 21<sup>st</sup>-century offers the first of many other frameworks that foster the role of education. In this sense, it mentions the need to balance and accommodate several tensions: global/local; universal/individual; tradition/modernity; long-term/short-term considerations; competition and cooperation; spiritual/material; existing curriculum/important new areas of knowledge.

Arriving in the 21<sup>st</sup>-century, and with the above-mentioned as a reference, the concepts of ESD and transformative pedagogy became vehicles for achieving the four pillars of learning, as well as helping to explicate a fifth pillar, which is: learning to transform oneself and society, to empower people with the values and abilities to assume responsibility for creating and enjoying a sustainable future (Schaeffer, 2006). In this sense, as recalled by Hart (2004, 2008), it is important to consider the person as a whole and to value contemplation. As this author maintains, contemplation is the third form of knowledge, which complements and enhances the rational and the sensory. It is also in this sense that we consider that a transformative education oriented towards sustainability and contemplating this dimension of totality (body, mind, emotion, spirit, and will) promotes creativity and divergent thoughts.

Despite these positive ideas associated with ESD, Kopnina and Cherniak (2016) claim that they are dominated by and "often entangled with notions of economic development prioritizing social justice over the interests of more-than-humans" (p. 835). Anyway, there is relative consensus that the main aim of ESD is to develop sustainability competencies, that is, cognitive, affective-motivational, and social skills and abilities that facilitate the resolution of sustainability-related problems and promote sustainable development in the most diverse contexts, at local, national or global levels. This means that pedagogical/curricular practices, in line with a transformative pedagogy, play a central role in sustainable development for students to make informed decisions regarding actions that benefit themselves and others, as well as social situations. This is also the Freirean perspective of transformative learning that links it to a goal of social change through criticism, and pressure on social structures (Freire, 1972). According to this author, critical thinking can increase our understanding of social situations. In line with these perspectives, the role of transformative educators is to be attuned to the energy field, the subtle nuances of change, as well as either habitual or novel responses in a learner.

Transformative learning implies a break from instrumental learning, based on transmissivity and transactional teaching, to make room for curricular practices where

students critically examine their habitual expectations, revise them, and develop skills necessary for participatory decision-making processes through a shift in consciousness processes (Michel et al., 2020).

Therefore, education that has a transformational pedagogical intention implies that teachers provide students with learning experiences that involve them in the analysis of local and global life situations and commit them to decision-making processes to improve the environment and the world. It is also in the same line of reasoning that UNESCO (2020) characterized the pedagogical/curricular practices related to ESD quality as learner-centered, action-oriented, and transformative.

As mentioned earlier, the study to which this article refers analyses data obtained under the 21C-SDG project. Its intention was to develop online educational materials about sustainable development goals to enhance students' knowledge about current societal issues, as well as competencies such as character, citizenship, collaboration, communication, creativity, and critical thinking, which are essential to their full development and success.

### 3. Method

The study combines quantitative and qualitative approaches, the latter based on an interpretative perspective (Denzin & Lincoln, 2011; Leavy & Hesse-Biber, 2008). From an empirical point of view, the study mobilized data related to the pedagogical/curricular activities planned within the 21C-SDG project. A questionnaire was also produced and applied to the 20 teachers from 10 schools belonging to peripheral areas of large cities (70% public) from the six countries that are part of the partnership. The majority of the teachers are female (19; 95%), with the following distribution per country: 3 teachers from Cyprus; 2 from Denmark; 3 from Italy; 3 from Latvia; 6 from Portugal (the only team with 1 man); 3 from the Republic of North Macedonia. All of these teachers had, at least, 5 years of teaching service in the 5<sup>th</sup>, 6<sup>th</sup> years, 7<sup>th</sup>, 8<sup>th</sup>, and 9<sup>th</sup> years of schooling in the following curricular areas: Math and Science Education, Citizenship Education, Physics and Chemistry, and Biology.

The data collection questionnaire was originally constructed for this study's purpose. The questionnaire included three parts. The first asked teachers about the identification of the pedagogical/curricular practices implemented. The second part of the questionnaire intended to evaluate teachers' opinions about the pedagogical/curricular practices that have been carried out and the students' improvements regarding: sustainable development goals knowledge and awareness; students' soft skills development; teachers' openness to deeper topics covered in the activities carried out; teachers' intentions to develop similar activities with other classes. Teachers expressed their opinion on a five-point Likert scale, from "I strongly disagree" to "I strongly agree". The third part of the questionnaire was focused on both critical issues and benefits for students related to the activities performed. Teachers were asked to express their opinion regarding the impact of the pedagogical/curricular activities on the students' ability to use the six 21<sup>st</sup>-century competencies explored within the 21C-SDG project. Teachers' position was expressed in a choice between "Not at all", "A little", "Quite high", "High level" (from 0 to 3 points), and a justification. Through this justification, teachers had the opportunity to explain how transformative teaching practices had contributed to the development of 21<sup>st</sup>-century competencies in the students involved in the project. A final dichotomous question (Yes/No) was included in the third part of the questionnaire to evaluate

teachers' availability to extend their knowledge of all curricular/pedagogical activities plans to further promote students' 21<sup>st</sup>-century skills.

Concerning the data collected from pedagogical/curricular activities planned, its structure was the same for all countries and contained the following items: objectives, activity details, tips for the teacher, debriefing, follow-up/inspiration. Table 1 presents the countries and the SDGs targeted in the analyzed plans.

**Table 1**

*Pedagogical/curricular activities plan identification*

ID	Country	Pedagogical/curricular plans themes (SDGs)
P1	Denmark	12. Responsible consumption and production
P2		5. Gender equality
P3	Cyprus	13. Climate action
P4		4. Quality education
P5		11. Sustainable cities and communities
P6	Italy	13. Climate action
P7		4. Quality education
P8		5. Gender equality
P9	Latvia	13. Climate action
P10		4. Quality education
P11	Portugal	11. Sustainable cities and communities
P12		11. Sustainable cities and communities
P13	Republic of North Macedonia	12. Responsible consumption and production

The closed-ended questions were treated as quantitative variables. Data analysis from those questions was translated into a descriptive process based on the absolute and/or relative frequency of the teachers' answers, supported by the Statistical Package for the Social Sciences (SPSS 27.0). Other data was interpreted through content analysis (Elo et al., 2014), supported by indicators related to the 21<sup>st</sup>-century competencies (Fullan & Langworthy, 2014), and transformative pedagogy. Regarding the qualitative analysis of the 21<sup>st</sup>-century competencies, a more detailed analysis was carried out on the teachers' answers to identify the key characteristics previously defined for each of these competencies (Table 2). Thus, the categories of analysis were established previously, and the analysis of the answers to the open questions began with the identification of sentences or meaningful parts of sentences, which were subsequently included in the pre-defined categories of the analysis.

The key characteristics functioned as a category and were identified using a particular reference framework: the sustainable development objectives worked on in the 21C-SDG project in their relationship with the competencies of transformative pedagogy.

**Table 2**  
***Benchmark of key characteristics for 21<sup>st</sup>-century competencies in the framework of the SDGs***

21 <sup>st</sup> -Century Competencies	Key Characteristics
Character	Learning to learn and the ability to regulate own learning process Ability to say “no” and claim their value Goal-oriented work Resistance/Endurance Self-regulation in social behavior Ability to recognize and admit one’s own mistakes
Citizenship	Thinking as global citizens Exploring global problems (using in-depth understanding and different values and worldviews) Genuine interests and skills in solving complex real-world problems affecting sustainability Empathy and capacity to care for others Ability to define alternatives for action and set priorities Ability to make intelligent and informed decisions
Collaboration and Team Work	Cooperation in teams Interpersonal skills and team-related skills When necessary, solving conflicts and positively tackling competition Social, emotional, and intercultural skills Learning from others and contributing to the learning of others
Communication	Ability to communicate using a variety of methods Ability to communicate with digital tools Ability to adapt communication to different groups Ability to reflect and communicate better
Critical Thinking and Problem Solving	Ability to evaluate information and arguments Critical evaluation and ability to question information Ability to see connections and patterns Ability to solve problems Ability to make knowledge meaningful Ability to explore, reflect and follow up on ideas in real life
Creativity and Imagination	Ability to create innovative ideas and non-traditional solutions Ability to employ own creativity in action processes Having “entrepreneurship” within the given possibilities Asking relevant questions to consider and following up on new ideas and solutions Ability to do something with their ideas

*Note.* Built from Fullan and Langworthy (2014).

The analysis of the theoretical framework (Gaard et al., 2017; Leicht et al., 2018; Michel et al., 2020; Moyer & Sinclair, 2020; Rieckmann, 2018; Sterling, 2001) allowed the identification of 12 indicators of pedagogical/curricular practices in line with a transformative pedagogy, related to teaching-learning situations that:

- Students learn aspects related to social issues (TPIIn1);
- Promote interaction and sharing among students (TPIIn2);
- Encourage reflection-inducing questioning (TPTPIIn3);
- Privileges a learning climate conducive to presenting opinions (TPIIn4);

- Everyday life or the environment are analyzed and discussed (TPIIn5);
- Students are asked to make decisions and to justify them (TPIIn6);
- Students access sources of information, rather than just being imparted knowledge (TPIIn7);
- Students, individually or collectively, identify problems and conceive plans of action/intervention (TPIIn8);
- Promotes the analysis and discussion of actions that contribute to the sustainable development of the environment and the world (TPIIn9);
- Students, individually or collectively, think of themselves as agents of intervention to promote positive transformations (TPIIn10);
- Encourage integrated visions based on principles and value (social, ecological, economic, and cultural dimensions) (TPIIn11);
- Students develop strategies for self-assessing learning activities, personal and social values (In12).

These indicators served as a basis for the analysis of data obtained from teachers' open responses to the questionnaire and the pedagogical/curricular activities plans.

## 4. Results

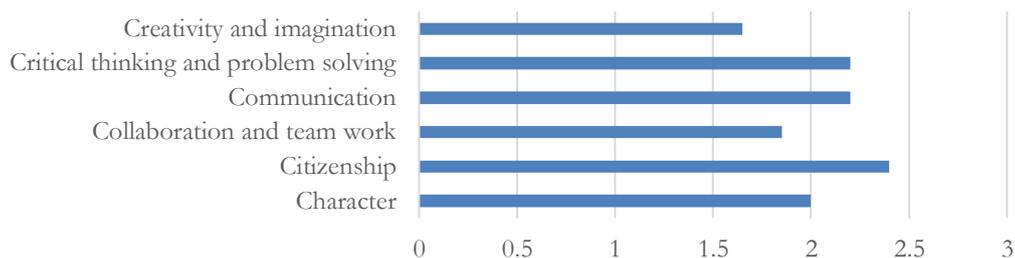
The main findings of the research are presented according to the research questions.

### 4.1. 21<sup>st</sup>-century competencies within pedagogical/curricular practices

The results concerning the question “What 21<sup>st</sup>-century competencies do teachers consider students have developed through the pedagogical/curricular practices of the 21C-SDG project?” are presented in Figure 1. It shows the average scores given by teachers, which resulted from the sum of the scores, divided by the number of teachers.

**Figure 1**

*Average scores for each of the 21<sup>st</sup>-century competencies*

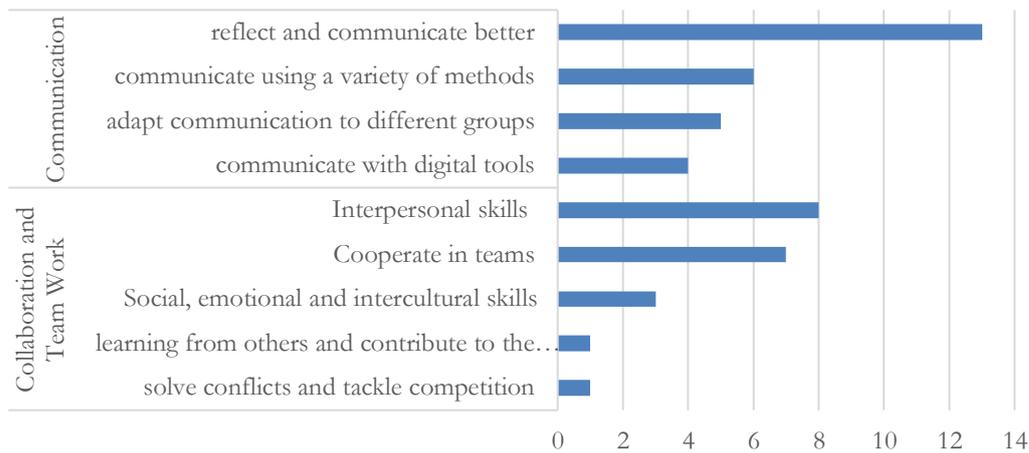


Based on the score (from 0 to 3 points) given by teachers to each of the 21<sup>st</sup>-century competencies, there is evidence of a certain balance of scores, whereby none of these competency's scores are below the average value of 1.5 points, and “citizenship” is the one most valued by teachers, achieving a score of 2.4. As the results show, when asked about students' development related to the 21<sup>st</sup>-century competencies promoted by the project, teachers show a favorable and equitable positioning toward the six competencies referred to by Fullan and Langworthy (2014).

A more in-depth analysis, based on the key characteristics for 21<sup>st</sup>-century competencies, in the framework of the sustainable development objectives, was carried out. The recording of the absolute frequency of those key characteristics (for each of the competencies) was supported by the qualitative analysis of teachers' justifications for each score assigned. The following Figures 2, 3, and 4 present this analysis.

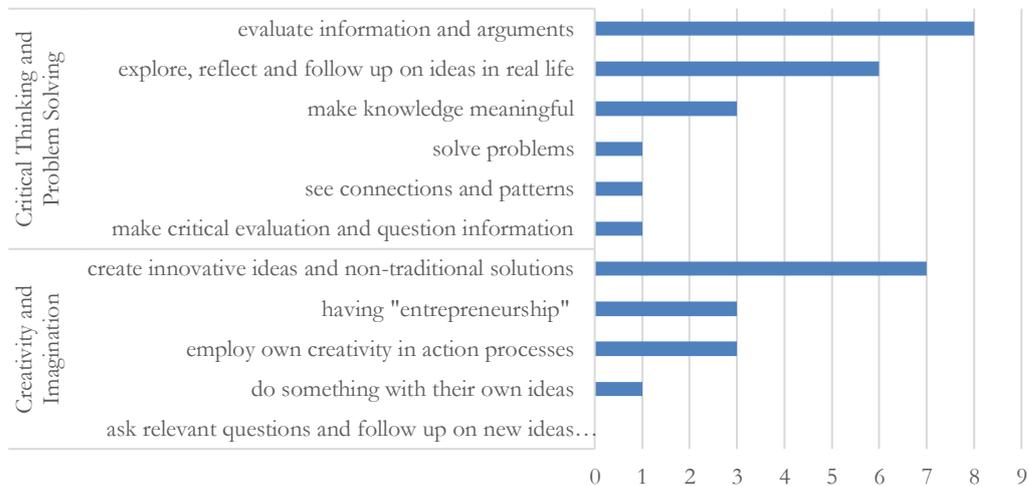
**Figure 2**

*Absolute frequency of references to the key characteristics of communication and collaboration and teamwork*



**Figure 3**

*Absolute frequency of references to the key characteristics of critical thinking and problem-solving and creativity and imagination*



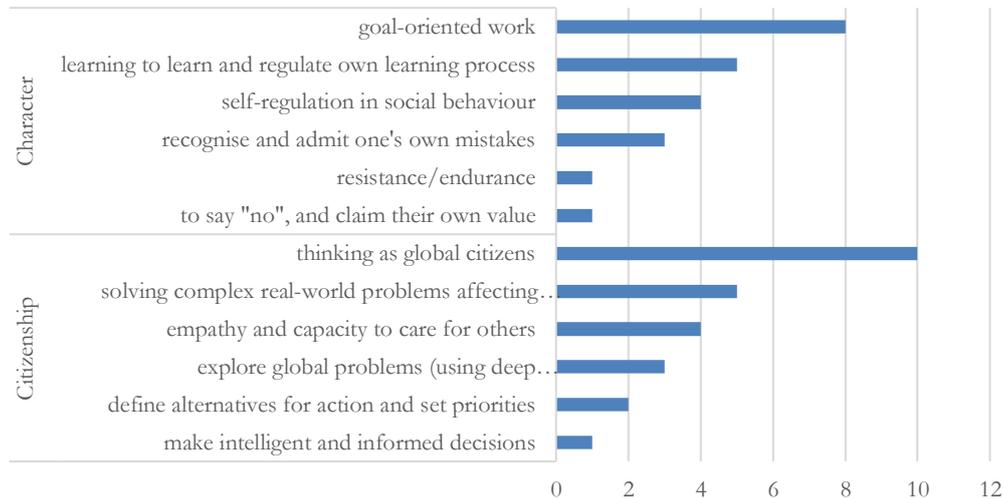
The results in Figures 2, 3, and 4 allow us to highlight some key characteristics for each of the 21<sup>st</sup>-century skills that, according to the teachers' opinions, could be developed in the students who participated in this project. These key characteristics are:

- the ability to direct the work according to the established goals
- the ability to think as global citizens
- the ability to cooperate in teams and develop interpersonal and team-related skills

- the ability to reflect and communicate better
- the ability to evaluate information and arguments
- the ability to create innovative ideas and non-traditional solutions

**Figure 4**

*Absolute frequency of references to the key characteristics of character and citizenship and imagination*



As Figure 2 shows, within the competence of “communication”, the ability to reflect is emphasized. The opposite can be seen in the ability to solve conflicts. Interestingly, in the competence of “critical thinking and problem-solving” (Figure 3), the ability to evaluate information and arguments and the ability to explore, reflect and follow up on ideas stand out. The ability to solve problems is less strongly perceived by teachers. The same is true when the focus is on the competence of “creativity and imagination”, as the ability to create innovative and non-traditional ideas overlaps with the ability to do something with one’s ideas, i.e. to activate the dimension of acting. The citizenship domain (Figure 4) is slightly highlighted concerning the skills of thinking as a global citizen and less so the ability to make informed decisions or the ability to define alternative courses of action.

#### ***4.2. Pedagogical/curricular activities in line with a transformative pedagogy***

Regarding the question “What characteristics of these pedagogical/curricular activities are in line with a transformative pedagogy?”, Figure 5 shows the frequency relative to occurrences of each indicator of the transformative pedagogy. This was obtained by the content analysis of the teacher’s open responses to the questionnaires regarding the benefits attributed to pedagogical/curricular activities carried out (N = 20) as well as the plan of the pedagogical/curricular activities (N = 13).

As presented in Figure 5, the benefits of the developed pedagogical/curricular activities identified by teachers are related mainly to “situations that encourage reflection-inducing questioning” (eight references), followed by the idea of “students, individually or collectively, think of themselves as agents of intervention to promote positive transformations” (five references). It is also important to note the lack of references to students developing strategies for self-assessing learning activities and to the possibility of them making decisions and justifying them.

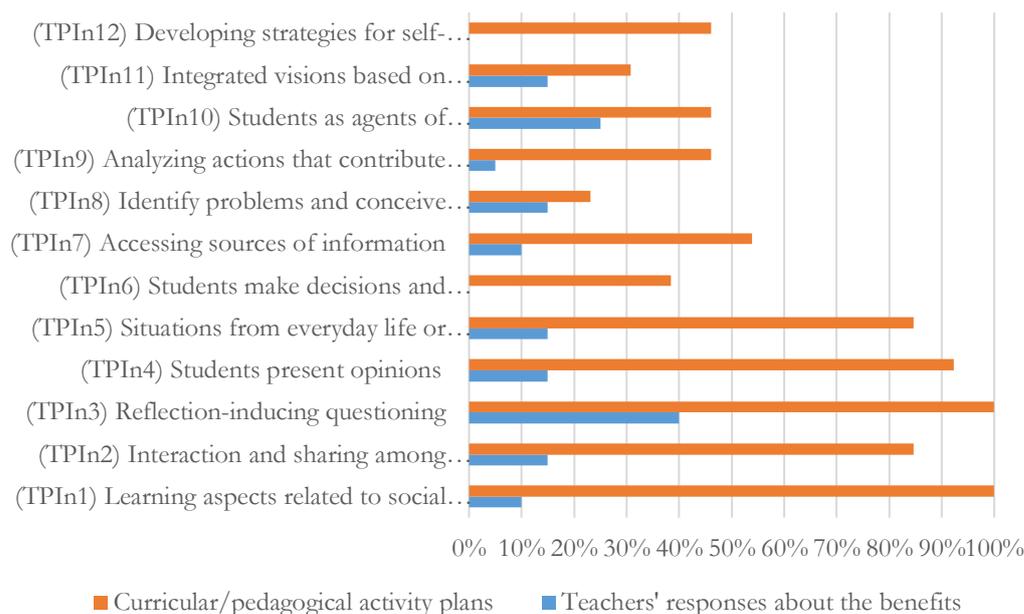
The encouragement of reflection-inducing questioning as a benefit of developed activities can be inferred by the following statements:

*The activities encourage students to reflect on the problems that exist in our surrounding society, to pay attention to the global problems related to the generation of waste in our daily lives, their negative effects on the environment, and climate change. (Q13)*

*One of the most important benefits was the awareness students have gained about the topics discussed in class. (Q15)*

**Figure 5**

**Indicators of a transformative pedagogy identified in teacher's open responses to the questionnaires and the pedagogical/curricular activities plans**



As concerns the possibility of students, individually or collectively, thinking of themselves as agents of intervention to promote positive transformations, this indicator can be identified in the following statements:

*The benefits of these activities are fundamental for the growth of children who learn to be protagonists in the face of future choices for society, and not only passive. (Q8)*

*Increased awareness that each of us can do something useful for the environment. Helping to understand that any action, also seen as "small", multiplied among all, really does a lot. (Q10)*

The totality of the transformative pedagogy indicators was identified in the content analysis of the curricular/pedagogical activity plans. Nevertheless, the results revealed that all of them placed the greatest value on "learning aspects concerning social issues" and "strategies conducive to reflection-inducing questioning", followed by the "learning climate conducive to students presenting opinions" (12 references), "interaction and sharing among students" (11 references) and "everyday life or the environment analyzed and discussed" (11 references). The least mentioned items were related to the "encouragement of integrated visions based on principles and values (social, ecological, economic, and cultural dimensions)" (four references) and to the "opportunity of students, individually or collectively, to identify problems and conceive plans of action/intervention" (three references).

The learning aspects concerning social issues referred to in the activity plans are mainly related to contents linked to the target SDG and also to the social values and principles they convey. Examples of this include: “Introduce the term ‘food waste’” (P1); “Gain a general understanding of what gender inequality is” (P2); “Claim values that are in line with SDG12” (P3); “Development and improvement of our social self” (P4); “Distinguishing climate change that is cyclical and produced by physiological natural transformations from those that are produced by human activity” (P6); “Acquire awareness of the opportunities for assistance guaranteed by national and international bodies” (P8); and “Learn how to work in a team and cooperate for achieving SDG11” (P11).

Regarding the strategies which are conducive to reflection-inducing questioning, all the plans propose that teachers ask questions to induce reflection. As, for example:

*There is no doubt that the sustainability of the planet is at risk. What should we do? How should we proceed individually or collectively to avoid an ecological disaster? (P10)*

*What do we know about the problem/situation? What do we need to know? How can we know it? How can we organize our study? (P13)*

The intention to create a learning climate that is conducive to students presenting opinions is present in almost all the plans. This fact can be identified by the student presenting opinions orally (e.g. P1, P4, P7, P8, P10), by writing reports (P6), creating posters, infographics (P1, P12), or drawing mind maps (P13). The opportunity to interact and share ideas is also evident in the majority of plans, which propose activities that stimulate interaction and sharing among students, essentially via group work. Most of the discussions and the planned tasks involve aspects of everyday life or the environment, such as:

*The students will purchase discarded food products in stores and ask the store about their strategy for less food waste. The collected products will be placed in the classroom. (P1)*

*Each group will discuss internally, thinking about its own city/village and what it needs most to become beautiful and livable. (P5)*

*Each group will talk about their daily habits and the places they visit frequently, and then answer three questions (is that safe? Is that clean? Is that eco-friendly?). (P11)*

### ***4.3. Teachers’ openness to developing pedagogical/curricular practices, in line with the 21<sup>st</sup>-century competencies towards a transformative pedagogy***

Concerning the question “What importance can international projects have in achieving long-term pedagogical/curricular practices, in line with the 21<sup>st</sup>-century competencies towards a transformative pedagogy?”, the results provide evidence that 95% of the teachers surveyed are available to expand the topics covered in the pedagogical/curricular activities carried out with their students. All of the teachers are also willing to test the same activities with other classes. Finally, when asked directly about extending their knowledge of the all-curricular/pedagogical activities plans to further promote students’ 21<sup>st</sup>-century skills, all of the teachers answer positively.

The main constraint associated with the implementation of these practices was the shortage of time (65% of the cases). The restrictions raised by the pandemic were indicated by only 10% of teachers, as well as the difficulty in adjusting pedagogical/curricular activities to the students, particularly to the younger ones with lower levels of maturity.

## 5. Discussion

The results revealed confluences and divergences between what was planned by the teachers and what they considered to be most beneficial concerning the pedagogical/curricular activities implemented. The main convergence is related to the promotion of situations that encourage reflection-inducing questioning. In fact, in the totality of the plans and the majority of the open answers, there is a tendency to value a contextualized reflection supported by the SDGs' contents, values, and principles of action.

This convergence is reinforced by teachers' opinions about the usefulness of the activity to raise awareness and to make students reflect on the issues that are the subject of the sustainable development goals addressed is favorable for all of them (60% strongly agree and 40% agree). In addition, a curious finding is that 90% of the teachers agree or strongly agree with the potential of the curricular/pedagogical activities in students' exploitation of soft skills and the acquisition of new ones. No doubts arise from this finding, regarding TPIIn3 ("encourage reflection-inducing questioning"), because it is underpinned by critical thinking, one of the most important soft skills, addressing the ability to question methods, identify problems, seek new solutions, and review processes. However, other soft skills (such as empathy, proactivity, creativity, communication, or interpersonal interaction), clearly included in other indicators (for example, in TPIIn2, 4, 9, or 10) are not evident in this convergence of results.

The main divergence is related to the indicators "Students are asked to make decisions and to justify them" and "Students develop strategies for self-assessing learning activities, personal and social values". It seems that even though teachers consider the decision-making and self-assessment aspects of the planning, it isn't what they value the most as benefits of the activities. The same line of reasoning can be applied to "Students learn aspects related to social issues", which is present in all plans but only in two open answers. The opposite situation arises for indicator TPIIn10 ("Students, individually or collectively, think of themselves as agents of intervention to promote positive transformations"). As one of the least identified in the content analysis of the curricular/pedagogical activities plans, this indicator is one of the most frequently mentioned by teachers when reporting on the benefits gained by their students with the implementation of curricular/pedagogical activities.

In sum, the results of this study highlight the "thinking dimension", that is, the benefits that the students involved in this project have gained in terms of rationalization, reflection, and awareness of sustainability issues, in keeping with Moyer and Sinclair's (2020, p. 343) "instrumental learning outcome" concept, related to "learning about how the world works and how to accomplish desired ends (...); and communicative learning, which involves interpreting, understanding, and conveying meaning in social interactions, including negotiating norms and desired ends". This dimension is evident not only in the pedagogical/curricular practices planned by teachers but also in their opinions about the characteristics of 21<sup>st</sup>-century competencies and the development of soft skills. The promotion of situations that encourage reflection-inducing questioning is a central result of this study.

The "dimension of intervention" (individual or collective), is less evident in the pedagogical/curricular practices planned by teachers and therefore concerning decision-making processes (Crowley & Moxon, 2018; Michel et al., 2020), as stated by Moyer and Sinclair (2020). This is even more critical when taking into consideration the teachers' opinions regarding the benefits for the students arising from the implementation of the project. However, agency power (Biesta, 2003; Priestley et al.,

2013, 2015a, 2015b) requires a thinking dimension and the 21C-SDG project seems to have contributed to this effect, according to teachers involved. Nevertheless, agency power necessarily implies the “dimension of intervention”, and this does not appear evident in the results of this study. It is possible that the trend of “deciding to intervene” is still very much linked to the teacher’s role and not to the students’ role, which is in line with what has been argued by Gaard and others (2017).

However, taking transformative pedagogy as a reference, the active participation of students is crucial in the decision-making process. The same idea underlies the arguments of Mithans and others (2017) that participation enables young people to develop social and organizational skills to respond to social changes. So, it is possible to conclude that projects such as 21C-SDG offer opportunities for teachers to reflect on the issue of students’ agency. In any case, it remains to be seen whether projects without continuity and with short-lived impact can by themselves act as catalysts for the intended change, in line with transformative pedagogy.

In sum, it was found that teachers recognized the usefulness of the pedagogical/curricular practices included in the project, both in promoting students’ awareness of the SDGs and in developing their transversal skills. They present a positive equitable position in relation to the development of the 21<sup>st</sup>-century competencies advocated by Fullan and Langworthy (2014). It is important to mention that teachers valued the learning aspects of social issues and the strategies that lead to reflective questioning.

The limitations of the study are related to the size and diversity of the sample and the different socio-cultural characteristics of the participants from different countries. Another limitation was that the activities were developed in a short time, during the pandemic, which may have influenced the teachers’ perceptions. Another limitation in addressing application practices is that they presuppose their own times and spaces, which will have an impact on school organizations. Therefore, it is possible to find some resistance to change (Monteiro et al., 2020), that can hamper transformative pedagogy experiences in real contexts. Despite that, teachers showed great willingness to continue investing in these practices, not only in deepening them among the students already involved in the project, but also in extending them to other students. The involvement of teachers in the project reveals the need for greater investment in the production of knowledge, with a focus on transformative pedagogy in its relation to education for sustainability. So, the knowledge that this study allowed to obtain will support practical applications and will offer an opportunity for teachers to reflect on student’s sense of agency. Finally, the exploration of other SDGs that were not contemplated in this project may provide more clues to deepen this theme.

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