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Embedding Sustainability Justice in Greek Secondary Curricula through the DeCoRe Plus Methodology

Georgios Vouzaxakis [1], Vassilios Makrakis [2] and Nelly Kostoulas-Makrakis [3,*]

[1] Secondary School Directorate, 71202 Heraklion, Crete, Greece; gvouzaxakis@yahoo.com
[2] School of Education and Social Sciences, Frederick University, 1036 Nicosia, Cyprus; pre.mv@frederick.ac.cy
[3] Department of Primary Education, University of Crete, 74150 Rethymnon, Crete, Greece
* Correspondence: nkostoula@uoc.gr

Abstract: This paper describes the processes of embedding Sustainability Justice in secondary education curricula for economic courses in Greece applying the DeCoRe plus methodology and participatory action research. These processes resulted in a reconstructed curriculum that was implemented by nine teachers teaching courses in economics. Sustainability justice emphasizes the ethics and praxis of education for sustainability and requires an understanding of the curriculum as a process and praxis and teaching as an ethical and political praxis. The implementation of the diagnostic evaluation of DeCoRe plus showed that economics teachers in Greece select more behavioral than constructive-emancipatory teaching approaches. On the other hand, the implementation of the reconstructed curriculum units in their courses using the DeCoRe plus methodology revealed a shift from instructive to constructivist and emancipatory teaching and learning approaches. Teachers by the great majority declared the political and ethical perspective of teaching and seeing curriculum as a living text that can always be under the process of deconstruction, construction, and reconstruction.

Keywords: sustainability justice; education for sustainability; DeCoRe plus; economics; curricula; secondary education

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1. Introduction

The Intergovernmental Panel on Climate Change (IPCC) has been consistently warning about global warming and that the measures taken so far are not enough [1]. To tackle the climate change crisis, there is a need for drastic cuts in emissions of planet-warming greenhouse gasses. The current sustainability crisis is also an outcome of the consequences of unsustainable economic growth leading to the degradation and depletion of global resources, as well as huge global social inequalities [2,3]. Humanity is living in a crisis of sustainability that includes not only environmental issues but also social, economic, and cultural. In the prevailing socio-economic model, the average expenditure on cosmetics, perfume, and bath preparation products in America amounted to 183.09 dollars per consumer, which is about 0.50 per day [4] while 10 percent of the world's population lives on less than US $1.90 a day [5]. At the same time, global military spending is $1.7 trillion [6] which is enough to tackle poverty and hunger, locally and globally. These examples show that consumers are not only individuals of all social strata but also businesses and governments, who drive consumers' behaviors, and the systems that influence peoples' choices and needs. Educating people on sustainability justice, a concept advanced by Makrakis [7,8] is of paramount importance, especially in primary and secondary school education. Sustainability justice is perceived as a process and praxis. The former refers to the integration of the ethics of sustainability justice across the curriculum and teaching practices and the latter seeks to engage learners and teachers in learning to transform themselves and society. In particular, the concept of sustainability justice reflects four pillars of sustainable development, namely: (1) economy, in seeking fair distribution of resources, opportunities, and

responsibilities (2) environment, challenging the roots of environmental, social, economic, and cultural injustice; (3) society, empowering all people to raise their voices, advocating for a more sustainable and just society and 4) culture, exhibiting empathy, inter-cultural understanding, and practicing social solidarity among other things [7].

Since the 1990s much has been said about Education for Sustainable Development as a means for raising awareness on sustainability issues and developing competencies to tackle unsustainable ways of living. Sá, Lourenço, and Carlos [9] found that research on sustainability competencies and especially their integration into educational curricula and teacher education programs are needed. Indeed, reconstructing education at all levels to address real-life issues is one of the major thrusts of education for sustainability justice. A reconstructed curriculum addressing sustainability injustices will also guide and motivate learners to shift from awareness, knowledge, and pro-environmental attitudes to critical reflection, socio-political consciousness, and action. Previous research shows that there is a lack of knowledge about sustainability competencies, a lack of training in education for sustainable development, and a lack of systemic and creative thinking [10] that are necessary for reconstructing curricula to address sustainability injustices. Most of the previous experiences in reconstructing curricula are underpinned by transformative teaching and learning approaches as well as participatory curriculum development approaches to address sustainability focus on tertiary education [11,12]. Although education research has acknowledged the value of transformative pedagogies, which offers an opportunity for rethinking how appropriate and successful educational practices may be, there is a lack of studies that examine the extent to which transformative sustainability learning may be integrated [13]. The challenges posed by the sustainability crisis in higher education require paradigm shifts in what is taught, why it is taught, and how it is taught. Above all, there is a need to educate individuals who are able to bridge the isolated academic fields in order to develop sustainable alternatives that are ecologically sound and socially equitable [14,15].

Makrakis [7] has developed the DeCoRe plus methodological approach- an acronym of Deconstruction-Construction-Reconstruction in order to embed sustainability justice in curricula across all education levels. The DeCoRe plus approach contains six, not linear processes presented in Table 1.

Table 1. DeCoRe plus Processes.

DeCoRe + Processes	Key Concepts in Each Process
Diagnostic evaluation	Reflecting on: (a) who we are; (b) what we have (existing knowledge); (c) where we want to go; and (d) why we want to go there.
Deconstruction	Analyzing critically the function of personal perspectives/habits of mind and chosen curriculum units/modules.
Construction	Gathering resources, creating ideas, and constructing new meanings (perspectives).
Reconstruction	Integration of newly constructed knowledge in line with the reconstructed frame of reference.
Implementation	Carrying out the reconstructed curriculum unit/module supplemented by service learning.
Summative Evaluation	Reflecting and evaluating what has been learned and changed.

Makrakis [7] (p. 112).

The theoretical underpinning of the DeCoRe plus methodological approach derives from critical social theory, critical pedagogy, and postmodern conceptions of teaching, learning, and curriculum, largely presented in the previous section [16–19]. In addition to that, the DeCoRe plus methodology draws much from Freire's [20] concept of critical consciousness which refers to a process in which learners develop the ability to pose questions

and take action on the social, political, cultural, and economic contexts that influence and shape their lives. DeCoRe + is also underpinned by Habermas's [21] theory of constitutive knowledge and human interests classified as technical, practical, and emancipatory, each one addressing specific ways of knowing and learning as well as being and behaving. According to Habermas [21], "Orientation toward technical control, toward mutual understanding in the conduct of life, and toward emancipation from seemingly 'natural' constraint establish the specific viewpoints from which we can apprehend reality as such in any way whatsoever" (p. 311). A better understanding of these cognitive interests could facilitate interpretations and implications of the teaching, learning, and curriculum decisions taken [22] and can be used as a reference for exploring teachers' personal theories and teaching practices for sustainability justice.

To this end, the study was planned to focus on teachers teaching courses in economics at the upper secondary level across Greece. The importance of Economics in the career path of upper secondary school graduates is justified by the fact that many engineers, sociologists, mathematicians, and even doctors follow up postgraduate programs in Management or in combination with their subject. However, the most important task of courses in economics at the upper secondary school is to increase the public's financial literacy in a subject that is of critical importance to citizens in many aspects of their lives, beyond their professional careers. The specific research questions addressed in this study were the following:

- Research question 1: What are the underpinning pedagogical theories of teaching methods in economics courses at the upper secondary school level?
- Research question 2: What are the key themes and concepts taught in the economics courses?
- Research question 3: What are the underlying assumptions/messages conveyed through the content of the economics courses?
- Research question 4: Is there any interdisciplinary approach applied in teaching economics courses at the upper secondary school level?

2. Materials and Methods

The research carried out was primarily based on participatory and emancipatory action research using the DeCoRe plus methodology [7] supplemented by a research survey. Participatory and emancipatory action research goes beyond the practical knowledge interest as it integrates the principle of human agency [23,24]. Some of the key methodological principles of this research paradigm are based on the concepts of collaboration, dialogue, critical reflection, constructive critique, dialectics, empowerment, and shared experiences [25–27]. In particular, the transformative perspective in this type of action research reveals its potential to alter traditional power structures pertaining to knowledge transmission and reproduction of sustainability injustices.

Quantitative data were collected at the diagnostic phase of the deconstruction process to identify predominant teaching methods and their compliance with the reconstructed orientation of the existing economics course curricula. In fact, the economics course curricula were mostly interpreted on the basis of the textbooks suggested by the educational authorities. It is also interesting to say that teachers perceive textbooks as curricula, a misconception that is largely due to a lack of proper knowledge of curriculum theories [28,29]. In general, textbooks are the most visible components of a curriculum and are often considered the key resources that shape the teaching and learning processes [30,31].

Qualitative data were collected from nine economics teachers who were pooled voluntarily from a sample of 243 teachers in economics surveyed at the diagnostic phase of the curriculum deconstruction process. These teachers were acting as co-researchers in the whole process and the roles assigned were those of co-researchers, curriculum developers, and implementors of the reconstructed units developed within the eight courses in the field of economics in secondary schools. The courses infused with sustainability issues were: Business Organization and Management, Economic Theory, Introduction to Marketing,

Introduction to Tourism, Political Education, and Basic Principles of Social Sciences. The emancipatory action research team operated as a forum for dialogue and critique and a resource for feedback and reflection. Each member had chosen two thematic units of the reconstructed curriculum to implement in their relevant courses.

The survey research instrument was based on a semi-structured questionnaire that aimed to examine teachers' teaching practices that were considered important in designing the process of deconstruction, construction, and reconstruction of new teaching and learning units in economics infused with issues related to the four dimensions of sustainability justice (environmental justice, social justice, economic justice, and cultural justice). The questionnaire was adjusted to the Google Forms tool and the economics teachers answered it online. The online link to the questionnaire was sent via e-mail twice to all the General High Schools and Vocational High Schools in Greece. The questionnaire was answered by 243 secondary school economics teachers out of a total of 1.737 [32], or 14% of the total population from all over Greece. About 60% of the teachers who answered were women, while 86.8% of the teachers who answered were between 25 and 54 years old. About 60% of the teachers taught in a General High School (GHS), 25% in a Vocational High School (VHS), 8% taught in both a GHS and a VHS while only 4.5% served in an administrative position. All of the teachers possessed a university degree in the area of Economics. 36% of the sample has more than fifteen years of teaching experience, while about 35% has up to nine years of teaching experience. In terms of educational background, 19% had obtained a second degree and about 48% of them had completed post-graduate studies. Besides that, 52% of the participants have attended some sort of pedagogical training program. Among the respondents, 88% declared that they have excellent or good knowledge-familiarity with ICTs.

To facilitate the data analysis, two composite variables were constructed the first reflecting teacher-centered teaching methods and the second student-centered teaching methods. The former composite variable is underpinned by behaviorist and cognitive perceptions of teaching and learning as well as viewing curriculum as a product. The latter composite variable is underpinned by constructivist and emancipatory perceptions of teaching and learning as well as viewing curriculum as a process and praxis.

In order to check the reliability of the two composite variables, Cronbach's Alpha test was conducted. For the reliability test of the composite variable representing teacher-centered approaches, the alpha coefficient reached 0.70 which is considered satisfactory, while for the student-centered teaching approaches", consisting of eleven items, the α coefficient was 0.87. The Paired-Samples *t*-test procedure was used to compare the means of the two composite variables for a single group. The procedure computed the differences between values of the two variables for each case and tests whether the average differs from 0.

For the open-ended questions, a thematic analysis was used, including the processes of familiarization re-reading the data transcripts), initialization (organizing the data meaningfully and systematically), determination (Determining coding categories and searching for meaningful themes, verification (Avoiding bias and increasing the trustworthiness), theorization (Moving to a level of abstraction through making convincing inferences), and presentation (Communicating the processes and practices) [33].

3. Results

At the diagnostic level (Research question 1), the results show that teachers of courses in the area of economics in secondary education are using more behavioristic teaching approaches (teacher-centered) than constructivist-emancipatory teaching methods (student-centered). The average mean for the teacher-centered is 2.54 based on a scale of 1–4 where 4 = very often and 1-none at all compared to 2.34 for student-centered teaching methods. Table 2 shows the Paired-Samples *t*-test results revealed that the means of the teacher-centered and student-centered methods are statistically significant at $p < 0.001$, showing that economics teachers use more teaching approaches underpinned by behaviouristic theories of learning than student-centered teaching methods underpinned by constructivist-

emancipatory teaching approaches. The use of active and participatory teaching approaches is observed at a lesser frequency, but not negligible.

Table 2. Paired-Samples *t*-test results.

Paired Samples Statistics					
	Mean	N	Std. Deviation	Std. Error Mean	
Behavioral	2.5407	243	0.55128	0.03536	
Constructive-Emancipatory	2.3412	243	0.53913	0.03459	
Paired Samples Correlations					
			N	Correlation	Sig.
Behavioral & Constructive-Emancipatory			0243	0.928	0.000
Paired Samples Test					
		t	(Df)	Sig. (2-tailed)	
Behavioral & Constructive-Emancipatory		15.040	242	0.000	

These results were very important and provided a resource for designing and implementing the DeCoRe plus methodology. The key results of this process in the area of economics highlighted the following:

At the development level (Research question 2): Very few references were detected mostly related to conventional development indicators. The references were associated with a narrow understanding of concepts such as cost, human needs, GDP (Gross Domestic Product), and well-being within a system that prioritizes profit as a development incentive. Given the economic challenges facing Greece during the period of the study and many other countries across the globe, it was expected that content would be adjusted accordingly. For example, teaching content should reflect the notion of engendering learning activities with social entrepreneurship issues of economic development and distributive justice. It was also assumed that in the reconstructed courses more attention should be paid to the role of production and consumption patterns and behaviours in relation to sustainable economic growth.

At the social/cultural level (Research question 3): References related to attitudes and values of sustainability were very limited. Many underlying assumptions revealed supported and ultimately reproduced the dominant unsustainable ways of life. For the reconstruction process special attention was paid to human consumption patterns contrasted with the differentiation between needs and wants. It is of particular importance for students to understand that excessive satisfaction of wants, generates unsustainable lifestyles, which place immense stress on the environment. Raising students' consciousness of the poor and underprivileged people who are unable to meet food, health care, climate change, and shelter needs were among the issues that would possibly lead to changing unsustainable consumption patterns, which eventually will help reduce wastage and the use of finite resources in the production process.

At the teaching methodology level (Research question 4): The interdisciplinary approach to issues related to environmental, social, and cultural pillars of sustainability justice was found to be very limited. The teaching methods applied seemed to be related more to surface learning than to deep learning. Lecturing was the predominant type of teaching. There was also expressed a strong need to update, enrich, and connect teaching methods to real-life experiences supplemented by authentic assessment of learning outcomes.

Constructing and reconstructing the selected course units was directed towards creating an engaging and meaningful learning experience for students while at the same time promoting sustainability and addressing real-world challenges. This can be seen through a narrative from a co-researcher teacher (Co8) who pointed out she shifted "...away from reproducing a text-based curriculum and a transmission of knowledge or information". In another narrative, the respondent expressed how the reconstructed curriculum has con-

tributed to forming her own teaching approaches enabled by ICTs. "Having the experience from the 1st implementation of reconstructed curriculum, I think at the next phase I will be more self-confident and risk-taking".

The revised curriculum was based on ten flexible, adaptable, expandable, and open educational unit-learning topics–scenarios. As one co-researcher (Co2) argued ". . .the curriculum was effective in the sense that it encouraged different teaching methods that motivated students to deal with real-life sustainability problems. . .[that]. . .I think it changed the attitude and mentality of the learners" . . .It was an experiential process and the information was delivered to them more effectively. An alternative way of teaching that was well received by the learners". According to another co-researcher (Co5), ". . .working in groups can finally change power relations within the classroom".

4. Discussion

In Greece, despite progress in promoting a constructivist perspective in teaching, learning, and curriculum, most of the teachers are still practicing a mix of teaching methods dominated by teacher-centered approaches that are in alignment with a centrally produced curriculum by the Ministry of Education. A product-oriented approach to curriculum development does not give the time and/or the space for teachers to make any interventions in the prescribed content. Within the current social and educational context, the teacher, without realizing it, plays the role of a manager who is expected to transmit a centrally designed and standardized curriculum. In such a context, it is predictable that the dominant teaching approaches will be driven by teachers and that ignorance seems to be one of the key obstacles to the effective use of transformative teaching methods in line with previous research [34]. This study was developed with the aim to show an alternative approach to teaching, learning, and curriculum, that perceives the teacher as an actor rather than a transmitter of a product-oriented curriculum. Teachers as curriculum developers have to reorder and enrich the curriculum and above all critically access school knowledge. Viewing the curriculum as a process underpinned by constructivist learning and even as a praxis that complies with emancipatory and transformative teaching and learning approaches necessitates a shift from a vertical structure to a horizontally structured curriculum [35,36]. This participatory and emancipatory-oriented action research shows that its full implementation requires changes in the curriculum structure and philosophy. However, the implementation of a horizontal curriculum structure contrasted to a vertical one that currently dominates cannot be achieved overnight.

In the DeCoRe plus diagnostic evaluation process, the central theme was reflecting on personal identity (who we are). This process was of particular importance as it has shaped teachers' perceptions of teaching, learning, and curriculum. Increasing teachers' and students' agency, that is, making them able to merge critical consciousness, knowledge, and action [37,38]. Such a merging is very critical at the personal and societal levels because agentic teachers and students pave the way for developing active local/global sustainable citizenship. This type of citizenship brings critical realism and pragmatism to the personal and social transformations necessary to meet the real-life issues found within the 17 Sustainable Development Goals [39,40] that are missing in economics education [41].

The reconstructed curriculum units in the economics courses that were infused with sustainability justice issues provided an opportunity for the participating teachers to reflect on the political and social implications of the educational process and their teaching choices and practices. As it has been also found in previous research [42,43], building teachers' capacities to alternative modes of teaching and learning and more flexible curricula enabled through participatory and emancipatory action research has been very critical and ultimately paved the way for enabling teachers to shift from a role as knowledge transmitters to knowledge constructors addressing issues of sustainability in economics textbooks. In the deconstruction process by applying the DeCoRe plus methodology, economics textbooks used in the Greek upper-secondary schools lack a systemic and interdisciplinary perspective. This is also substantiated by previous research that the analysis of economics and the

environment in an intersectional way, especially when describing concepts such as consumption, growth, distribution, markets, or international trade is absent [44]. Economics, combined with other social and behavioural sciences, is also very crucial for shifting human behaviour toward sustainable development' [45].

The DeCoRe plus methodology empowered participants to raise their own 'voice' on issues related to teaching, learning, and curriculum and find ways of overcoming the barriers that constrained them from doing so. The teachers' survey showed that developing teachers' self-transformation is not an easy process since most of them were anchored in a teacher-centered philosophy. There was a need to make a great effort to make positive changes. The teacher who is inspired by the philosophy of DeCoRe plus underpinned by critical pedagogy plays the role of a social reformer [46]. Pratt [47] argues that teachers functioning as social reformers are driven by an interest in creating a better society. In this sense, they view their teaching from a social reconstructionist perspective.

It has been also important to see the participating teachers holding the role of "social reformers' envisioning a more sustainable and just society. Teachers holding a social reform perspective in alignment with their teaching roles reflect much of the transformative teaching and learning paradigm that the current study has adopted. This also refers to Freire's notion of socio-political consciousness [20] and Giroux's [46,48] view of teachers as 'transformative intellectuals". Teachers acting as "transformative intellectuals" perceive teaching as an ethical and political praxis, link the school to society and society to the school and encourage political engagement for eliminating sustainability injustices. Previous research shows that, too often, teachers fail to function as change agents, largely due to the lack of these perceptions and/or underestimation of the role of teachers as social reformers [46,49]. Teachers functioning as social reformers are driven by a Social Reconstructionist perspective that emphasizes teachers' agency for learning to transform themselves and society [50–52] as well as linking ways of knowing with ways of being [50,53,54] and behaving. It is thus critical to empower teachers and students to construct their own paths of meaning-making and knowledge creation for building a more sustainable future.

5. Conclusions

The results of this study revealed that the teaching methodology that is dominant in most classrooms in Greece today is driven more by teacher-centered methodologies underpinned by an objectivist philosophy that views the teacher from a technical knowledge interest and knowledge as something outside of the key stakeholders (students and teachers) 'voices' in the teaching and learning process. The learning environment needed to provide the opportunity for teachers to transform teaching and learning toward education for sustainability could not be incorporated within a teacher-centered learning environment.

In deconstructing, constructing, and reconstructing courses in the area of economics in secondary education there was a need to provide a real-life context and meaning to the learning environment. In so doing, we drew heavily on constructivist and transformative learning theory which emphasises the notion that the learning process cannot be divorced from the context that students are situated in real life. Infusing the content of the reconstructed courses with issues related to the four pillars of sustainable development and focusing largely on sustainability injustices facing society, locally and globally, the participating teachers shifted from a non-authentic to an authentic context that reflects the way the knowledge will be used in real life.

Although an effort was made to get a representative sample of teachers teaching economics at the upper secondary school level across Greece, the results of this study should be generalized with caution since only 14% out of the total Economics teacher population responded to this study. It would be interesting to follow up on this research and see the impact of the community of teachers functioning as co-researchers in embedding sustainability justice in economics course curricula. The findings of this explorative study reveal that most Economics teachers encounter challenges with lesson planning,

contextualized and interdisciplinary learning, and the use of open education resources. In mitigation to these challenges, the study recommends that the school authorities at all levels should be more flexible in the content to be taught and allow teachers to develop student-driven learning materials embedded with sustainability justice issues, instead of demanding teachers to follow up prescribed decontextualized textbook-driven Economics curricula at the upper secondary school level.

Summing up, through this study, we have learned that teachers faced the challenge of positioning themselves either as agents of change on one end of the continuum or to position themselves as transmitters of prescribed knowledge and turning their students into passive recipients in their learning on the other end. The choice is not easy as it is affected by dominant structures and perspectives that are usually beyond their own control. The DeCoRe plus methodology applied in this study motivated teachers to raise social critique on the current state of sustainability injustices, locally and globally, critically reflect on their personal theories and practices, and envision more positive and sustainable futures. Through the critical reflective/reflexive process embedded in the DeCoRe plus methodology, teachers were able to "rewrite their personal theories" and reconstruct their own perspectives and habits of mind driven by an emancipatory knowledge interest and human agency for building a more sustainable and just society.

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