

# EffSET: a Self-Evaluation Tool to Assess the Effectiveness of Education for Sustainable Development

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## Abstract

Education for Sustainable Development (ESD) plays a prominent part in the process of building the ethical, responsible, and sustainable consciousness of future generations and in addressing the sustainability challenge that society is facing. Nevertheless, very few methodologies have been developed to assess the effectiveness of sustainable and responsible teaching, so far.

EffSET is a qualitative and quantitative instrument which was developed to enable Higher Education Institutions (HEIs) and instructors to classify and analyse their Corporate Social Responsibility (CSR) and Sustainability related courses and teaching concepts according to different criteria. The tool is also intended for benchmarking courses and HEIs in time (i.e. against previous years' evaluation) and space (i.e. against comparable courses/HEIs) and to become an instrument to foster debate on ESD within and outside the institution.

The idea behind EffSET is that a holistic perspective that involves, in an inclusive approach, values, strategy, operations, activities, stakeholders, structures, etc. of the HEIs and considers inputs and knowledge from different field of studies must sustain CSR/sustainability curricula/course if an effective impact on students' long-term ethical, sustainable, and responsible behaviour is the envisaged learning outcome. This paper introduces EffSET and discusses its methodology. Preliminary results from very first applications are, also, showed.

*Keywords: Education for Sustainable Development, Higher Education Institution, Sustainability teaching, Social Responsibility teaching, Evaluation, RCTs.*

## 1. Introduction

Education for Sustainable Development (ESD) plays a prominent role in the process of shaping the ethical, responsible, and sustainable consciousness of future generations.

Every year, more and more Higher Education Institutions (HEIs) take actions and systematically integrate social responsibility (SR) and sustainability in the organisation, in the management, in the study programs, in the research agenda, in the operations and in the relationship with the internal and external stakeholders.

Notwithstanding the massive effort of sustaining the transition process towards a more sustainable and responsible world, HEIs still lack of comprehensive instruments to assess their improvements and their performances in the field. EFFORT (EFFectiveness Of Responsibility Teaching) is a cooperative project, partially funded by the ERASMUS+ grant program of the European Union, aimed at developing tools, teaching formats, and guidelines to support HEIs and Instructors in improving the effectiveness and quality of teaching that endeavours to build competencies related to sustainability, ethics, CSR and

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responsible management. EffSET (EFFOR Self-Evaluation Tool) is one of the Intellectual Outputs developed by the EFFORT project.<sup>1</sup>

EffSET has been developed with the aim of allowing educators to assess their own teaching concepts/courses and in addition to put their concepts/courses into the context of their whole institution using different criteria regarding the SR/sustainability orientation of the course as well as the maturity of the integration of SR and sustainability in the institution.

EffSET is also intended to be a tool to foster debate on Education for Sustainable Development within and outside Institutions. In addition, it may inspire future research on the effectiveness of SR/sustainability teaching and ESD.

In this paper, after presenting the EffSET tool and the possible use of the outputs stemming from the self-evaluation instrument, we propose a further step in term of suggestions for policy makers by using the Randomized Controlled Trials (RCTs). The idea is to support the use of randomized evaluations and to encourage policy changes in HEIs based on results of randomized evaluations.

In session 2 we provide a review of the relevant literature. Section 3 introduces EffSET and discusses its main features. Section 4 explains how EffSET works, while Section 5 indicates how to use results. Section 6 presents possible results and section 7 develops a framework for the use of RCTs in HEIs' quality assessments. The last section concludes.

## **2. Literature Review**

The assessment of HEIs' SR and sustainability performances has gained prominence in the last decade as consequence of the growing importance that it is nowadays recognised to Education for sustainable development.

Although in their infancy, several evaluation instruments have been developed in order to measure HEIs sustainability related performances and achievements. They range from the long-term oriented Sustainability Tracking, Assessment & Rating System (STARS), assessing sustainability in the curricula and the management and operations, to the Auditing Instrument for Sustainability in Higher Education (AISHE) aimed at assessing study programs, to mere tools aiming at providing raising awareness raising, support and inspiration, like the My Environmental Education Evaluation Resource Assistant (MEERA).

O'Donoghue (2016) pointed out that sustainability teaching assessment tools can be clustered into two main groups: accountability-oriented, and internal processes focused. The former generally takes large account of objective indicators and are aimed at policy and managerial measurements. The latter are more inclined towards self and qualitative assessments and are oriented to improve actions and strategies.

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<sup>1</sup> Neither the European Commission nor the project's national funding agency, DAAD, are responsible for the content or liable for any losses or damage resulting from the use of these resources.

Adopting a different perspective, Alghamadi et al. (2017) remarked that in order to appreciate sustainability in universities, three main approaches can be followed: accounts assessment (raw data, converted to a common unit of measurement such as money, GHG savings, etc.), narrative assessment (combine text, maps, graphics and tabular data), and indicator-based assessment (qualitative and or quantitative measures of a fact or feature of interest).

Alba-Hidalgo et al. 2018 carried out a meta-analysis on the procedures and instruments of environmental sustainability evaluation in universities. Five main different approaches emerge from their analysis: a) monitoring and follow-up self-assessments; b) good practices benchmarking; c) ranking and rating; d) reporting achievements and progresses; and e) appraisal of institution wide sustainability.

Several limitations in the methods and in the instruments have been documented, still.

Fisher et al. (2015) and Findler et al. (2019) criticize the large use of indicators, such as energy efficiency measures or measures to enhance sustainability literacy of students and the very low emphasis on the impacts on the society and external stakeholders.

Yarime and Tanaka (2012) and Alghamadi et al (2017) stigmatize that the indicators used mainly focus on governance and operations issues while largely neglecting outreach, research achievements, and social and economic issues.

Findler et al. (2019) analysed 19 sustainability assessment tools specifically designed for HEIs with the aim of exploring extent to which these instruments are able to capture the complexities surrounding ESD impacts. Their results clearly indicate that the tools inspected converge on very few core domains such as education, operations, and governance. All other relevant features are rarely considered and weakly represented.

Finally, Berzosa et al. (2017) pointed out the extreme variability of the results of using different sustainability assessment tools, arguing the need of employing more than one instrument in order to catch the different facets of ESD and derive more than one perspective of analysis of the weaknesses and strengths of the HEI.

With the aim of overwhelming some of the limitations embedded in existing HEIs sustainability evaluation tools EffSET was developed.

### **3. EffSET: a Self-evaluation Tool**

The EFFORT Self-Evaluation Tool (EffSET) is a qualitative and quantitative instrument that has been developed to enable Higher Education Institutions (HEIs) and instructors to classify and analyse their Corporate Social Responsibility (CSR) and Sustainability-related courses and teaching concepts according to different criteria.

EffSET is based on an inclusive, holistic, and transdisciplinary perspective, incorporating the values, strategies, operations, activities, stakeholders, structures, etc. of HEIs. It helps HEIs and instructors in classifying their teaching courses and teaching concepts by using "course-level criteria" which are embedded in the context of the whole institution. This is achieved by integrating additional criteria regarding the maturity of Social Responsibility (SR) and Sustainability integration in the HEI, i.e. "institution-level criteria", enhancing self-evaluation, and providing indications on strategies and actions for improvement.

EffSET has been developed to permit clear-cut self-evaluation and a realistic portrait of the level and stage the CSR/sustainability-related teaching concept/course and the HEI have reached on their route towards a mature SR/sustainability integration while also inspiring coherent policies for progress and for guiding the development and implementation of strategies and actions to achieve more effective CSR/sustainability-related learning outcomes. It is also intended for benchmarking courses and HEIs in time (i.e. against previous year evaluation) and space (i.e. against comparable courses/HEIs).

EffSET makes great use of subjective assessments. Only a minor part of the indicators is based on objective measures. This approach was preferred in order to obtain the perception of qualitative dimensions by relevant stakeholders that would otherwise have been missed. Moreover, fact-based approaches typically do not take into account the real cultural and societal conditions or the historical background. Consequently, EffSET has deliberately avoided the traditional ranking/rating evaluation system, preferring to limit its final output to an overall synthetic aggregation of the indicators, thus leaving more freedom for evaluators and users to plan strategies and actions that move towards realistic and concretely achievable improvements.

Indeed, the main aim of EffSET is not to categorize or classify HEIs and teaching courses/concepts or to stress competition among HEIs or between educators. EffSET is an exercise aimed at supporting HEIs and educators in improving the effectiveness of ESD, even in leading Institutions.

EffSET can be used by any higher education institution that already integrates, or is interested in integrating, sustainability and/or CSR topics into teaching and operations. EffSET can also be of special interest to institutions promoting responsible education.

We acknowledge that the task of developing a comprehensive, reliable, and compelling self-evaluation tool is extremely challenging. We are also aware that substantially different approaches and perspectives in integrating CSR and Sustainability into Teaching, Research, and Institutions can be pursued. While we have made considerable progress towards our goal, we believe that there is still much more to do. Any feedback and suggestions from users will therefore be greatly appreciated. We also hope that the interest in EffSET goes beyond its routine use and gives rise to collaborative research.

#### **4. How it Works**

EffSET is made up of two distinct parts, the Institution and the Course assessment.

The first ("Institution" sheet) guides the self-assessment of HEI's maturity of SR/Sustainability integration. It takes into consideration twelve critical criteria (see, Pizzutilo and Venezia, 2021a for their formal definitions):

1. Governance
2. Strategy
3. Inclusive context
4. Measurement
5. Curricula
6. Research
7. Outreach

8. Funding
9. Identification
10. Consultation
11. Involvement
12. Co-creation

The criteria are grouped into three dimensions: Culture (K1 to K4), Mission (K5 to K8), and People (K9 to K12). Fig. 1 gives a visual description of the criteria and their relationship.



Fig. 1 Criteria and dimensions – Institution level evaluation

This evaluation is naturally oriented towards the Institution. Nevertheless, users may adapt it to divisions that have a defined organisational structure and governance (Departments, Schools, etc.). A total of 120 indicators (10 per dimension) should be rated by the evaluator(s) on a scale of 1 to 100. Given the multidimensional and transdisciplinary nature of this part, assessment should preferably be performed by a group of internal specialists, possibly with the addition of an external expert. This would then be communicated throughout the community in order to complement each "course level" self-evaluation in a consistent way, providing a basis for debate and brainstorming among stakeholders as well as inspiration for strategies and actions for improvement. However, the Institutional level self-evaluation can be accomplished by any single stakeholder (Pizzutilo-Venezia, 2021a).

The objective of the second part of the tool (Course level evaluation) is the single teaching course. Whilst the Institution level evaluation may be common for all the courses, each course requires its own self-assessment. The course level evaluation cannot be carried out with reference to a cluster or a group of teaching courses. A total of 45 indicators should be rated by the evaluator(s) on a scale of 1 to 100. The indicators are grouped into three dimensions Culture, Mission, and People, in line with the Institutional criteria classification. This part is intended to be assessed by the teaching team, possibly with the addition of an external expert, and should provide the basis for debates and brainstorming among stakeholders as well as inspiration for strategies and measures for improvement. However, the Course level self-evaluation can be accomplished by any single (internal or external) stakeholder.

In both parts, the evaluator(s) is(are) asked to assess each indicator on a scale of 1 to 100. A scale range description at the right of each indicator guides the assessment. The scale description is intentionally unique for similar groups of indicators in order to facilitate the assessment process and reduce self-perspective biases. Several items are not impartially measurable. Their assessment necessarily relies on the evaluator's judgment, on their perceptions and opinion.

## 5. How to Use Results

On the basis of the results obtained we have clusterized the institutions according to the different level of maturity in the integration process of SR (Pizzutilo-Venezia, 2021a, Pizzutilo-Venezia, 2021b).

**Laggard (1 to 10):** SR and Sustainability are not considered strategic nor are deemed to bring value. Related activities, if any, are sporadic and not coordinated. There is very little interest in ESD and in sustainable innovation.

**Aware (>10 to 35):** the importance of SR, Sustainability and ESD in facing modern sustainability challenges is largely acknowledged. SR and sustainability are perceived as source of innovation and universities central in facing modern sustainability challenges. Pressures for SR and sustainability to be institutionalised on a broader extent are more and more frequent. Nevertheless, the integration of SR and sustainability into the culture, the operations and among the stakeholders is still in its infancy.

**Implementer (>35 to 65):** SR and sustainability are considered strategic. There is a general attention to ESD and several sustainability related actions are carried out. Curricula generally deal with SR/sustainability topics in a more coordinated and structured way. Stakeholders start to interact to achieve SR/sustainability goals. Nevertheless integration is based essentially on a case-to-case basis.

**Exploiter (>65 to 90):** effective social value is delivered. The importance of ESD is implicit in everyday operations. SR/sustainability activities and learning outcomes are subject to public scrutiny and strategies to improve the performances are envisioned. A transdisciplinary perspective is usually reflected in the culture, the mission and the people dimensions. Stakeholders are generally involved in socially responsible and sustainable programs .

**Pioneer (>90):** advancements and new frontiers for sustainable development are continuously envisaged A mature integration of SR and sustainability characterises

everyday activities. Societal co-transformation is fostered and stakeholders' demand for a sustainable world addressed. Social responsibility and sustainability are envisioned as a shared purpose.

## 6. Experimental application

Two management courses for Undergraduate students of middle-size Central European Universities have been taken into account for an experimental assessment using EFFSET (HEI\_1 and HEI\_2 in the following). The course level assessments were completed by the course instructors. The same instructors assessed the Institution part. They addressed the items they believe to be not in the position to adequately evaluate to internal offices experienced in the field. In some cases, one of the instructors (HEI\_1) asked a third-party audit. Both the instructors are actively engaged in sustainability related research for long time and are enthusiast supporters of Education for Sustainable Development. Direct interviews were used to gather evaluators feedback on EffSET. In general, they reported to feel at ease and to had not found criticalities in assessing the course level part. On average, they reported that the part was completed in 28 minutes. On the contrary, both the evaluators stressed the lack of complete knowledge and information while conducting the Institution level evaluation. They reported that the assessment was time consuming and that they needed third party references to assess around one fifth of the items. They agreed on the opportunity of centralising this part of the self-assessment or to identify an office providing support and material for the evaluation. They positively evaluated the supporting material provided for the assessment (guidelines, overview and item comments). Institution, Course and Composite reports from EffSET are shown in figures 2 to 7.

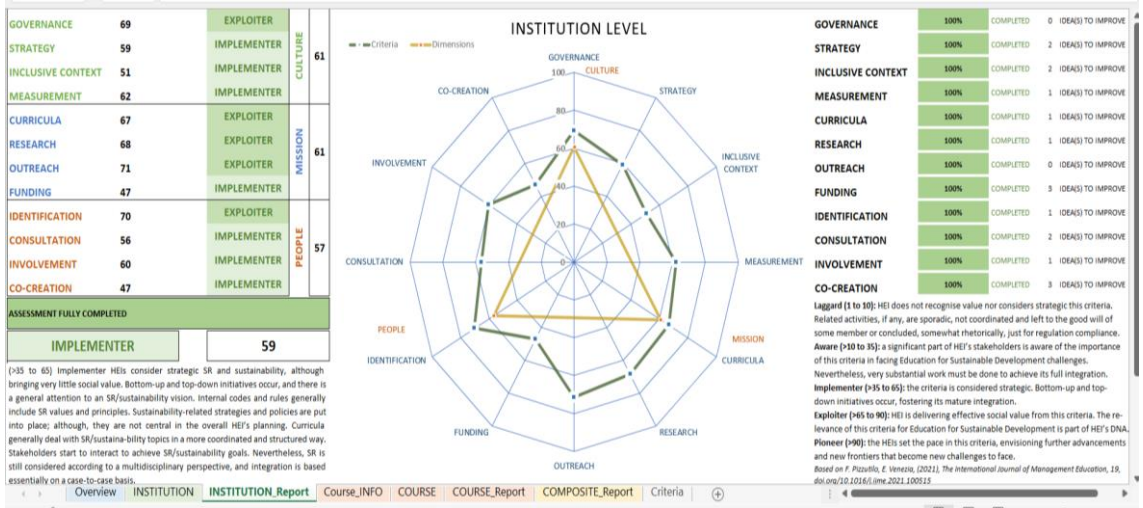


Fig. 2 HEI\_1 Institution Level Report

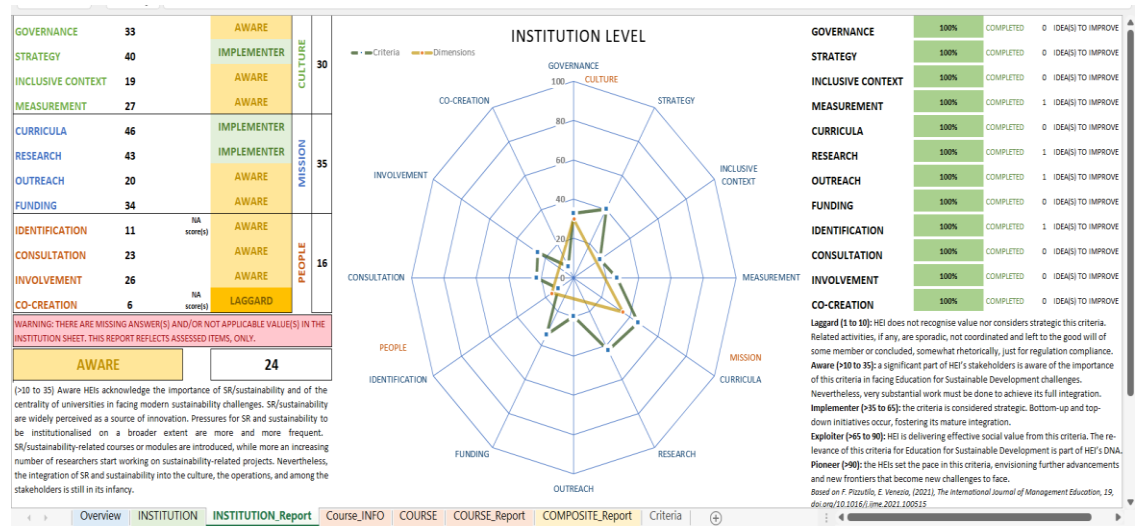


Fig. 3 HEI\_2 Institution Level Report



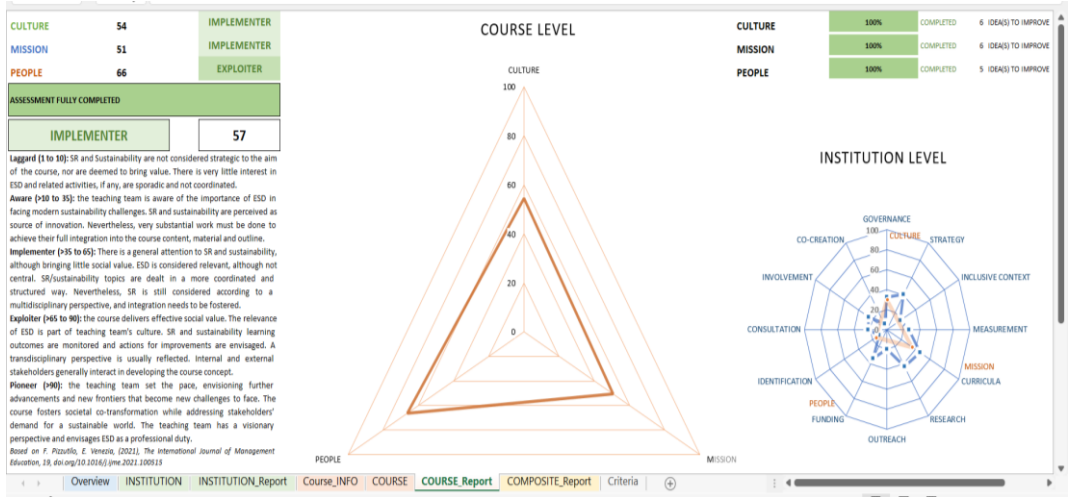


Fig. 4 HEI\_1 Course Level Report

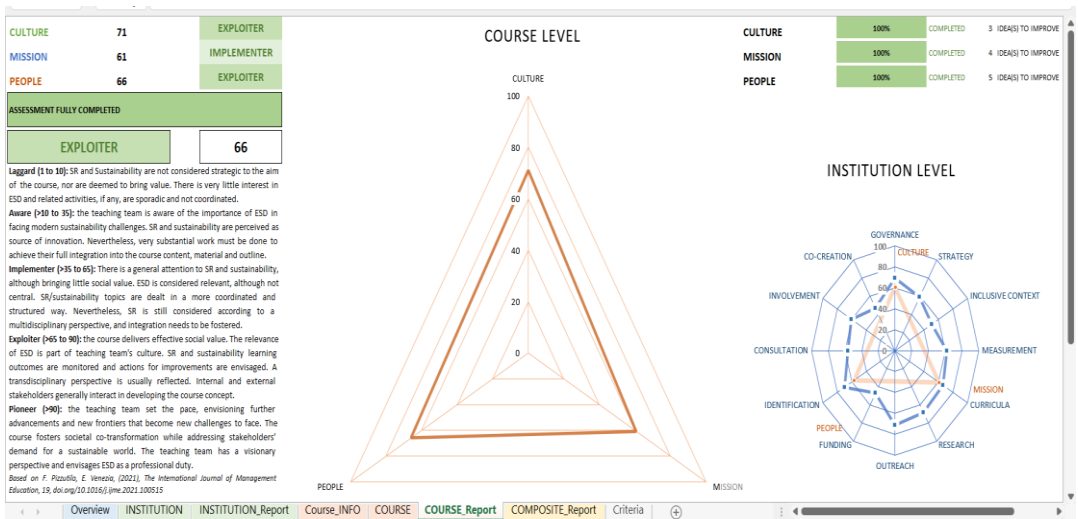


Fig. 5 HEI\_2 Course Level Report

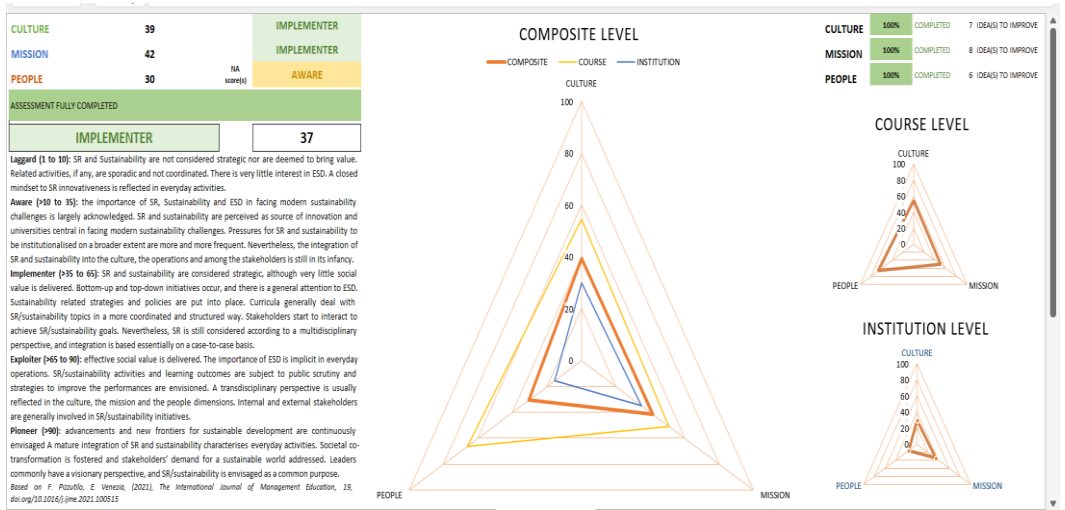


Fig. 6 HEI\_1 Composite Report

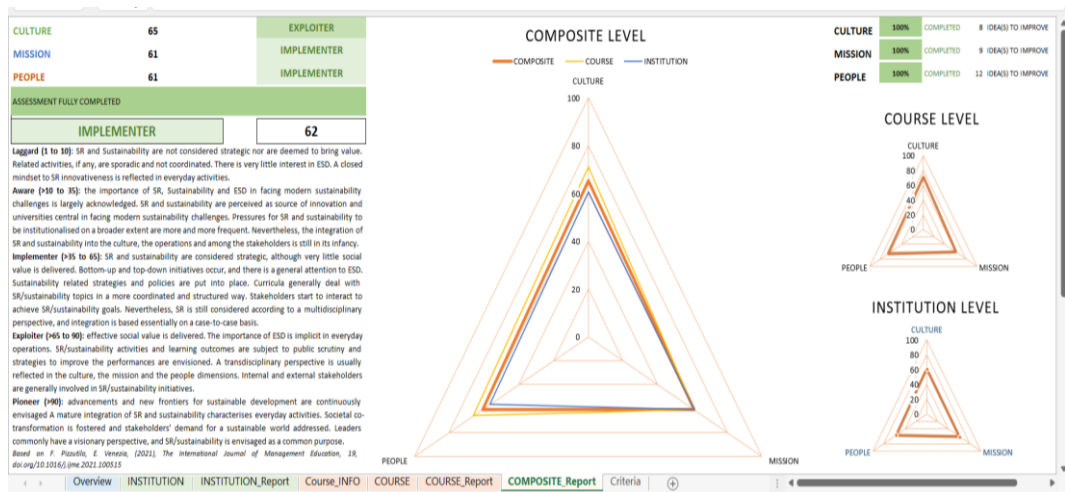


Fig. 7 HEI\_2 Composite Report

At the institution level, HEI\_1 seems to have a longer journey to fulfil in all the dimensions and the criteria under assessment in order to reach a mature integration of sustainability and social responsibility. The ability of HEI\_1 to co-create knowledge and innovation with the different stakeholders and, in general, the interaction with the people, the local community, and the industry, are the area where HEI\_1 needs to particularly invest. On the contrary, HEI\_2 seem to have reached respectable results in all the areas, pulled by its results in the educational dimension and supported by a strong governance committed to social responsibility.

No relevant differences appear to be at the course level, consistently with the resolute and long-term commitment of both the instructors to sustainability research and ESD.

Nevertheless, the higher maturity of sustainability and social responsibility integration at the institution level may drive more effective learning outputs by HEI\_1 courses, as suggested from the comparison of the composite level analyses.

Of great relevance, the large recourse of both the evaluators to take notes of ideas that came to their mind while assessing the indicators. Both of them reported that they find inspiration from the indicators for effective and easily implementable actions, especially during the course level evaluation.

Results indicate the level of integration of SR and sustainability according to the “label” which corresponds to the obtained score. The EffSET tool allows a graphical representation both at the institution level and at the course level in order to have an immediate view of the results. This preliminary analysis lays the foundations for further and more advanced analyzes that we propose below.

## 7. Randomized Controlled Trials (RCTs)

Cluster randomized designs are commonly used in pragmatic trial research evaluating the effect of policy interventions that are delivered to different areas. A key feature of these designs is that intact clusters are randomized to each arm, and outcome measurements are typically taken from each participant, just like individual randomized study designs. The statistical methods used for cluster randomized trials (CRTs) have been extensively studied for decades and have been made accessible in reported methodological reviews (Turner et al, 2017a, 2017b).

The basic idea is very simple: before adopting a large-scale public policy, it may be useful to create a pilot project - an RCT in fact - on a limited group of subjects in order to verify its effects. With the implementation of the pilot project, we want to understand if and to what extent the intervention can really make a difference, in which contexts and on which categories of people it works best and if there are unwanted side effects. The distinctive feature of this approach lies in the randomized selection of who will be subjected to the policy and who will be excluded from it. In practice, two groups are built by drawing lots, the first consisting of "treated", the second of "untreated".

The randomization process - if it is carried out following precise rules - allows the evaluator to compose two groups that have similar characteristics on average and lays the foundations for making a comparison on equal terms. In jargon it is said that the two groups thus formed are "statistically equivalent", that is, they have within them the same distribution of all the characteristics, observable and unobservable, in the possession of their components. Once this equivalence has been established, the group excluded from the treatment, called "control", allows us to reconstruct what would have happened to the first group, called "experimental", had it not received the treatment. The control group is represented by the one that has not implemented sustainability tools or has not integrated them into their political strategies. It will be the starting cluster. This plays a vital role in the experimental process. This group serves as a benchmark, allowing researchers to compare the experimental group with the control group to see what kind of impact adopting sustainable behaviors has. In order not to have any conditioning, the extraction is random. By using EFFSET on experiment group, the one which has not implemented the sustainability concepts, becomes the control group against the other which are “pure”

experimental. This will be the future application of the self-assessment tool EffSET at an aggregated macroeconomic level to evaluate sustainability policies.

In the evaluation of public policies, the use of randomized studies is relatively recent, but enormous progress has been made in the last decade. The most important recognition of the scientific relevance of this practice in the design of social and economic policies came in 2019 with the awarding of the Nobel Prize in Economics to Abhijit Banerjee, Esther Duflo and Michael Kremer (Glewwe, 2020). Three economists for years engaged in the construction, through experiments, of effective measures to prevent and combat poverty in the world. In our case we can randomly select HEIs belonging to the different cluster generated by EffSET, which are statistically equivalent, and evaluate the effects of implementing sustainable policies on the two selected groups belonging to different clusters. In order not to change the behaviour of the HEIs, the evaluators assign a code to each group, or possibly different codes for each HEI or course. The purpose of not showing who belongs to the control group or to the sample of subjects to which the studied variable is not altered in some way (called double blind), is to minimize errors, trying to ensure that any observed effect is due to the studied variable.

In the end we can possibly discuss three reasons why sustainable and CR policies may be less or more effective than expected:

- a policy may be ineffective because the selected audience was not appropriate for this type of intervention;
- we analyze design aspects of the intervention itself, and what variations may be incorporated to make it more effective;
- we consider the possibility that information policies aimed at increasing HEIs sensitivity may require a more aggressive approach, perhaps coupled with additional tolls, such as incentives, to overcome the implementation barriers.

Examples of these applications can be rarely found in the literature. One of these is the study by Abbiati et al. (2018), who present results of the field trials by evaluating the impact of the technology which can enhance teaching. The methodology is a combination of RCTs and self-assessment tools. However, to our best knowledge, there are no studies conducted in the terms proposed by us in this paper with reference to sustainability and SR. We therefore believe that this is a novelty contribution that deserves to be developed and applied in the different realities of the HEIs landscape.

## 8. Conclusions

Despite the large tendency of using quantitative parameters for benchmarking purposes, EffSET implements a flexible evaluation framework and design in order to catch qualitative and soft features of SR and sustainability teaching performances at HEIs and take into account cultural, historical and socio-economic differences among universities. Differently from other existing evaluation tools, EffSET is based on an inclusive, holistic, and transdisciplinary perspective, incorporating the values, strategies, operations, activities, stakeholders, facilities, etc. of higher education institutions. Moreover, it makes extensive use of subjective assessments. Only a small part of the indicators are based on objective measures. This approach was preferred in order to gain the perception of very important

qualitative dimensions in the evaluation of concepts such as sustainability and social responsibility, which would otherwise have been lacking.

Another relevant contribution to the existing literature is that EffSET has deliberately avoided the traditional ranking/rating system, preferring to limit its final output to an overall aggregation of indicators, thus leaving greater freedom for evaluators and users to plan strategies and actions that can lead to realistic and concretely achievable improvements.

The first experiences of self-evaluation have highlighted the goodness of the tool, its methodological validity and its usefulness in providing indications on concrete actions to be taken and stimuli for improvement.

A balanced set of indicators that consider both the Institutional and the course level dimension of Education for sustainable development is employed. Our concluding remarks on EffSET policy experimentation start by stressing the overall appreciation of its implementation. EffSET provides a lesson for all policy makers by proving that running robust policy experimentations on salient policy topics is not only recommended but also practically feasible.

From the initial design of the experimental protocol to the definition of its application in the different contexts, EffSET and the subsequent randomization analysis provide a wealth of lessons that can be used by policy makers to promote evaluation capacity building across all geographical areas.

At the same time, the feedback collected on the first applications has brought out some critical issues in the use of the tool to work on during the development of its next versions. In particular, minor refinements to the criteria and to some of the indicators are advisable in order to avoid possible misunderstanding in the scoring and in the interpretation of the results. A new analytical hierarchy process based on the first experiences can also be useful for a better calibration of the weights employed for dimensions and of the criteria score aggregation.

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