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Handprint of ESD – Case Universities of Applied Sciences in Finland

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Abstract

All 24 Universities of Applied Sciences (UASes) in Finland approved the joint programme for sustainable development and responsibility in autumn 2020. The objective of the programme is sustainable, responsible and carbon-neutral universities of applied sciences by 2030. The common goal is to reduce the footprint of university actions and to increase the impact, or “handprint,” in the development of society.

The handprint is related to the positive impacts and benefits that the action or measures bring to society or the environment. The handprint includes actions taken by the organization to help others reduce their emissions or improve their sustainability. Increasing the handprint of UASes means for example how to verify the effectiveness of education to strengthen students’ competences and motivation to promote sustainability, or impact of research, development and innovation (RDI) activities to increase the ability of the UAS partners, i.e. companies and other organizations, to promote sustainable development in their own operations and in their products and services. Unlike the calculation of the footprint, the calculation of the handprint is not entirely objective or accurate. It requires assessments and assumptions, as well as various metrics. In other words, it is not just a matter of calculation; several qualitative indicators are also needed.

In this paper we first present the concept of the handprint and the work done in Finnish UASes to define and measure the handprint especially concerning education for sustainable development (ESD). The work to evaluate the handprint is still in progress, but we introduce the findings done this far. We also give some practical implications by providing examples of solutions implemented at one UAS, Turku University of Applied Sciences (Turku UAS). These examples focus on engineering education being the largest study field at Turku UAS, but the findings are applicable for all study fields. Handprint data is also valuable in educating engineering students about the implications of their future professional decisions, given that sustainability is increasingly becoming a critical consideration in everyday engineering practice.

1 Introduction

In Finland, all 24 Universities of Applied Sciences (UASes) approved the joint programme for sustainable development and responsibility in autumn 2020. The objective of the programme is sustainable, responsible and carbon-neutral UASes by 2030. The common goal is to reduce the footprint of university actions and to increase the impact, or “handprint,” in the development of society.

The handprint is related to the positive impacts and benefits that the action or measures bring to society or the environment. “Carbon handprint” quantifies the reduction in carbon emissions associated with a particular activity, while “handprint” is a broader concept that evaluates the overall positive environmental and social impacts of that activity. The handprint includes actions taken by the organization to help others reduce their emissions or improve their sustainability. Increasing the handprint of UASes means for example how to verify the effectiveness of education to strengthen students’ competences and motivation

to promote sustainability, or impact of research, development and innovation (RDI) activities to increase the ability of the UAS partners, i.e. companies and other organizations, to promote sustainable development (SD) in their own operations and in their products and services. Calculation of the handprint is not entirely objective and accurate, as the calculation of the footprint may be. It requires assessments, assumptions, and various metrics.

In this paper we first present the concept of the handprint and the work done in Finnish UASes to define and measure the handprint especially concerning education for sustainable development (ESD). The work to evaluate the handprint in education is still in progress, but we introduce the findings done this far. We also give some practical implications by providing examples of solutions implemented at one UAS, Turku University of Applied Sciences (Turku UAS). These examples focus on engineering education being the largest study field at Turku UAS, but the findings are applicable for all study fields.

There has been a strong national co-operation between higher education institutions in Finland in promoting sustainable development from the year 2020. The findings described in this article are based on the participation in this co-operation and in international co-operation on sustainability work led by the EU, OECD and the United Nations, as well as on participatory observation of the development work done at Turku UAS. Thus, the research methodology is action research by nature—that is, a collaborative and iterative process of inquiry and problem-solving involving planning, action, observation, and reflection to improve practices and generate practical knowledge in real-world contexts.

2 What is a handprint?

Handprint thinking emerged in the early 2000 as a response to the concept of the footprint (Guillaume et al., 2020). Handprints can play an essential role in encouraging contributions to sustainability through a focus on positive actions of organizations and individuals (Center for Environment Education 2020).

As definition, a handprint refers to the reduction of the footprint that the developer of a new solution enables for another party. The new solution replaces a previous product or process, and the developer of the solution can make a claim about the handprint of the solution, but the user of the solution cannot, but should speak about reducing their own footprint. For example, a carbon handprint means that the products and services offered by an organization can reduce the carbon footprint of a customer – an individual or another organization. Similarly, a nature/ biodiversity handprint refers to the reduction of the biodiversity footprint/ nature harm that the developer of a new solution enables for another party. Thus, a handprint refers to the benefits to the climate and environment caused by the activity. It refers to work carried out to preserve biodiversity, save natural resources, achieve more efficient material recycling, promote social sustainability, and achieve a cleaner environment. (VTT 2024; Pajula et al. 2021; Grönman et al. 2018)

Handprinting methods have been developed worldwide for a variety of purposes, but approaches to higher education have not yet been widely presented. Handprint thinking in education follow the three main principles: 1) encouraging actions that have positive impacts, 2) adding value to footprint reductions and 3) indicating the potential for future improvement. (Guillaume et al. 2020) The difficult part is verifying the handprint in education. It can be stated that education can at least to some extent guide people towards, for example, moderating consumption habits. In this case, it would be possible, at least in theory, to evaluate

and calculate the carbon handprint for education in the manner described above, i.e., the assumed climate or nature benefits minus the baseline.

However, the evaluation is complicated by the fact that different people may act in the same way for different reasons and in different ways for the same reason. Verifying psychological causal relationships, such as the impact of education, can therefore be difficult: some students adopt the moderate lifestyle taught at the university, while others do not; some adopt that lifestyle because of the education they received at the university, while others do so for other reasons. Additionally, if the temporal distance between cause and effect is very long, it further raises questions about the existence and nature of the causal relationship.

On these grounds, it is necessary to distinguish between actual and potential handprints. It is reasonable to assume that the actual, or real, handprint is likely smaller than the potential, or possible, handprint. This is especially true for organizations such as educational institutions, whose positive impacts are largely psychological and based on knowledge, skills, and attitudes (Lehtonen 2023). A key question is, to what extent it is possible to verify and measure impacts that are based on the knowledge, skills, and attitudes and that may only materialize far in the future. In addition, what does this mean for organisation's sustainability reporting?

3 Towards sustainability reporting

Sustainability should gradually become a core purpose of higher education institutions (HEIs). The necessity for HEIs to provide education addressing complex interdependencies of environmental, social and economic issues is becoming increasingly apparent. Embracing structural and cultural changes which place sustainability at the core of governance and management of HEIs is a crucial means to increase the impact and success of activities. (Unesco 2022). Here the role of sustainability reporting is significant. Sustainability reports from HEIs can provide valuable insights into their sustainability performance, demonstrate their commitment to sustainability, and inspire others to act towards a more sustainable future (Haynes 2023).

The EU's Corporate Sustainability Reporting Directive (CSRD) is a new EU-wide sustainability legislation that, starting from 2024, requires all listed and large companies to report on their sustainability efforts comprehensively according to European Sustainability Reporting Standards ESRS (European Commission 2023). Although UASes would fall under the directive based on their size and turnover, according to a decision made by the Finnish Parliament's Economic Affairs Committee at the end of 2023, UASes are exempt from the CSRD reporting obligation. This decision was made because UASes are mostly owned by municipalities and cities and funded by the state, and because the Ministry of Education and Culture (later referred to as OKM) already provides guidelines for the financial management and reporting of universities and directs unified practices. (HE 20/2023, pp. 5–6). At the time of writing, the CSRD is widely discussed in Europe. The so-called Sustainability Omnibus package aims to improve the EU's competitiveness by reducing the administrative burden on companies and simplifying regulations. The key reform proposals of the package relate to the sustainability reporting directive. The proposal seeks to reduce the number of companies subject to reporting obligations (COM 2025).

There are various national and international programmes and initiatives related to sustainable development and responsibility for higher education communities (Alonso-Almeida et al., 2014, p. 145). In Finland, the

Rectors' Conference of Finnish Universities of Applied Sciences (Arene) published a sustainable development and responsibility programme "Sustainable, Responsible, and Carbon-Neutral University of Applied Sciences" in 2020. All 24 UASes in Finland have committed to this programme (Arene 2020). The goals of this joint sustainability and responsibility programme have been further developed in continuous national collaboration that each UAS can utilize and adapt to their own policies and activities. The strong national level collaboration led to the decision in 2024 that a common framework for sustainability reporting for UASes is needed despite the lack of a reporting obligation. In a joint discussion, it was noted that reporting should be developed in accordance with the CSRD standards, as it will certainly become the most important form of reporting, whether there is an obligation or not.

During 2024, UASes worked together on a reporting framework. It provides a general overview, followed by sections on Environmental, Social, and Governance (ESG) matters. In addition, the sections on the Education Handprint and Research, Development and Innovation (RDI) Handprint have been included too due to their essential position in the activities of UASes. The first version of the reporting framework was completed at the end of 2024. 13 out of 24 UASes decided to participate in the pilot, which means that they will produce the first pilot reports in spring-autumn 2025. Next, we will present what will be reported in the Education Handprint.

4 Handprint of education in sustainability reporting

As previously stated, the handprint of higher education in UASes materializes primarily when students bring sustainability expertise into society and in projects and theses carried out to reduce the carbon and ecological footprints of partners and stakeholders. Verifying the handprint accurately and objectively is challenging in higher education, where the positive impacts are largely based on knowledge, skills, and attitudes. Therefore, it is often referred to as a potential or indirect handprint. In reporting on the handprint of higher education, it is mainly the potential handprint that is used, i.e. assessment tools that are likely to produce handprint effects are used. The true measure would be specifically how much, for example, the carbon or biodiversity footprint of the receiving workplace decreases when they hire a graduate from a particular programme compared to hiring someone else. This assessment is currently challenging, which is why the evaluation of the handprint focuses for now on the potential handprint.

In the reporting framework, the following subsections are reported about the Education Handprint, following the CSRD structure:

1. Actions, metrics, and resources related to studies
2. Monitoring the effectiveness of actions through objectives
3. Information to be reported if metrics, actions, and/or objectives have not been implemented
4. Impacts on stakeholders and processes related to stakeholder engagement.

The greatest effort was made to define the content of the "Actions, metrics, and resources related to studies" in the reporting framework shown in Table 1.

Table 1: Reporting Questions in Actions and metrics related to the studies.

Reporting Questions in Actions and metrics related to the studies
<ul style="list-style-type: none">• Courses related to sustainability included in the studies/course offerings and their number, as well as the type of the courses (common/discipline/programme specific, compulsory/ elective; separate/ integrated)• Explanation of whether and how sustainability is considered in final theses (agreements, objectives, evaluation, guidelines)• Number of theses related to sustainability• Number of credits earned in RDI projects related to sustainability• Number and type of sustainability internships• Course feedback• Key actions implemented and planned for the reporting year and their expected results (e.g. SD training of employees)• Scope of key actions (stakeholders involved)• Time horizon for implementing the actions• Type of current and future financial and other resources allocated to the action plan and information on whether the ability to implement the actions is subject to any conditions, such as the granting of financial support• Any other actions or initiatives primarily aimed at improving the sustainability of education• How the effectiveness of these actions will be monitored and evaluated• Description of the processes used to determine which actions are needed and appropriate

The subsection “2. Monitoring the effectiveness of actions through objectives”, focuses on monitoring principles, e.g. whether and how the development of the number of sustainability courses or student feedback on the sustainability content of the course is monitored. Subsection 3 describes the reason why actions have not been taken and possibly a date by which they are planned to be implemented, or information on why objectives are not planned to be set. Subsection “4. Impacts on stakeholders and processes related to stakeholder engagement”, includes the evaluation of the Education Handprint through stakeholder interaction and communication, e.g. through feedback surveys, such as student feedback surveys, employer surveys, stakeholder surveys, and alumni surveys.

5 Handprint reporting at Turku UAS

Turku University of Applied Sciences is a multidisciplinary educational community of 13,000 experts, including over 12 000 students and 800 staff members. Located in Southwest Finland, Turku UAS operates globally, particularly in various research and development activities. The university offers bachelor's and master's degree programmes in engineering, business, arts, health care, and social sciences, as well as collaborative doctoral programmes with Åbo Akademi University. Engineering is the largest field of study at Turku UAS.

At Turku UAS sustainable development is reflected in all activities and promoted according to the four themes of the Arene programme: education and training, RDI activities, management and competent personnel, and metrics and monitoring. (Arene 2020) Turku UAS is committed to reducing its carbon footprint annually, with the goal of achieving carbon neutrality by 2029. Nature footprint is planned to be calculated in near future. Simultaneously, the university is enhancing its positive impact, its handprint, which reflects the influence of Turku UAS's educational programmes and RDI activities in driving societal, business, and industrial transformations in the region towards green economy and greater sustainability. The handprint is further expanded through several initiatives such as the circular economy and forest

conservation. Turku UAS is also currently in the process of acquiring its own forest. In RDI activities, a set of criteria related to their sustainability dimensions has been incorporated into the evaluation of projects. Concerning management and competent personnel, the training plan is intended to ensure that personnel possess the necessary competencies. SD orientation has been organized for the personnel and SD training is offered. The implementation of sustainability programme is contingent upon the engagement and collaboration of the staff. In order to achieve ambitious targets, it is of utmost importance that there is full commitment from top management. (Joshi et al. 2025)

The Turku UAS sustainable development and responsibility programme has been devised with the objective of incorporating sustainable development SD competence of all individuals within the Turku UAS community. (Turku UAS 2024) The specific promises concerning education in the programme of Turku UAS are as follows:

- We ensure the common learning outcomes for sustainable development and responsibility at Turku University of Applied Sciences and support the integration of the topic into field specific studies.
- We reinforce the role of sustainable development and responsibility in all curricula and in the course supply for lifelong learning.
- We promote and enable the development of sustainability expertise by integrating RDI in learning and teaching.
- We monitor regularly the achievement and impact of competences in sustainable development and responsibility.
- We work openly in extensive cooperation with higher education institutions, other educational institutions, working life and other stakeholders to promote sustainable development.

The objective of ensuring that all educational initiatives promote sustainable development is fundamental to accomplishing the established goals concerning the inclusion of the handprint in educational settings. The initiative is supported by concrete measures, including the incorporation of 3 ECTS of SD studies into the curriculum for all students, as well as the implementation of measures designed to facilitate curriculum development. For instance, the incorporation of a sustainability perspective into the planning of course implementations and guidelines for integrating sustainability into course contents and methods is imperative. In addition to mandatory sustainability courses, the curriculum guidelines advocate for the incorporation of a sustainability perspective as a transversal theme across all academic disciplines.

Qualitative metrics, including curriculum analysis and student surveys, have been implemented to facilitate management and evaluation. In the fall of 2024, the course feedback survey was expanded to include an inquiry into whether the programmes had contributed to the enhancement of students' competencies in sustainable development.

In recent years, a self-assessment process was conducted among all engineering programmes to define the baseline for SD maturity level, using SD standard descriptions in the CDIO approach (CDIO 2022). Nevertheless, the workload associated with this process is too substantial to be managed on an annual basis.

The assessment of theses promoting sustainable development is conducted through a thesis agreement, which queries whether the thesis presents a perspective that promotes sustainable development. Merely addressing sustainable development in the theoretical framework of the thesis is insufficient; the work must advance one or more dimensions of sustainable development (ecological, social, economic, and/or cultural sustainability). The implementation of this monitoring occurred at the end of 2024, and as a result, there is

an absence of data at this time regarding the number of these promoting sustainable development. A parallel development process is underway regarding internships during studies.

One of the goals of the renewed SD programme in 2024 (Turku UAS 2024) is to engage and encourage the entire UAS community meaning also its stakeholders to promote sustainable development. The most important stakeholder group are students. Their role in sustainability work is central to HEIs, and there is a broad discussion with students about their wishes and ways to participate and influence. Monitoring indicators reflecting student activity and participation (e.g. how the student union organizes sustainable development activities) are still under development.

6 Conclusions

Measuring and reporting the handprint in higher education is challenging, as previously described, and this first pilot reporting period will not come close to resolving the related questions. The structure of the CSRD model, which serves as the basis for the reporting model, preferably requires more quantitative indicators. As the data sources presented in Table 1 and data collected from stakeholders shows, many of these metrics measuring the potential handprint are qualitative, only few of them being quantitative. Evaluation and reporting the handprint of higher education is based on numerous criteria and depends on the data collection systems and methods available. After the piloting, there is a high probability that these metrics will undergo modification and specification. This will occur as the viability of alternative metrics becomes apparent, either through the advancement of data collection methodologies or the identification of metrics that necessitate abandonment or redefinition due to encountered data collection challenges. It can also be noted that the handprint of higher education may not be positive at all, despite all the described goals and measures, when considering the effectiveness of education on society and the entire biosphere. This is because, so far, higher education institutions still train people, also in engineering, to maintain and even promote the current societal model based on economic growth and increasing consumption. On the other hand, engineering education also has perhaps the greatest potential to enhance the sustainability handprint of education through various footprint-reducing solutions and expertise.

Nonetheless, the pilot reporting will be instrumental in the development and monitoring of the measurement of handprint and for making progress in the project. The development of monitoring tools is an integral component of the initiative. In addition to the technical aspects, the initiative will also encompass the communication aspect, as it is imperative to establish effective channels of communication with stakeholders to ensure transparency and clarity regarding the sustainability efforts. The implementation of sustainability reporting demonstrates also to students the importance of accountability and environmental stewardship within all organizations and facets of life (Filho et al 2022). Reporting also enables comparisons between UASes, which can spur them all to achieve even better results in sustainability work. It is particularly good that all Finnish UASes are involved in the creation and development of the reporting model, as the work would be too demanding for one university to undertake alone.

Universities of Applied Sciences are committed to sustainably and responsibly developing the surrounding society, working life, and its actors, and reporting on the impact of their education on sustainable development. The negative climate records of the previous year serve as a sad example and highlight the paramount importance of this comprehensive initiative.

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