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INTEGRATING SUSTAINABILITY INTO INFORMATION AND KNOWLEDGE MANAGEMENT CURRICULUM

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Abstract

The study aims to answer the research question of how to integrate sustainability into information and knowledge management curriculum and course design, and what kind of opportunities and challenges relate to this curriculum development. The empirical study was conducted in the Finnish university that holds the Degree Programme in Information and Knowledge Management. The action-oriented case study research methodology was applied, and different sources of data are used from participatory observation to interviews. In the results, different means to sustainability integration are analysed and evaluated.

Keywords: *Sustainability, curriculum development, information and knowledge management, management education, higher education.*

1. Introduction

Humanity is exceeding the planetary boundaries which are needed to sustain life on earth in its current form (Steffen et al., 2015; Fanning et al., 2022; Persson et al., 2022). The 2030 Agenda for Sustainable Development, with its 17 Sustainable Development Goals (SDGs) adopted by all United Nations Member States in 2015 has been a central way to respond to this problem (UN, 2023). Similarly, in the fields of higher and management education as well in the management research, this ecological crisis of biodiversity loss and climate change has prompted different kinds of responses. In business and management research, the discussion on value creation has changed from an egocentric, company-focused perspective towards a more system-based view, where the focus is on creating a net positive impact on the socio-ecological system and enhancing the health of the system (Dyllick & Muff, 2016; Kurucz et al., 2017: Hahn & Tampe, 2021). In this novel view, value creation aims for sustainable and collective value and to address societal and environmental needs and sustainability challenges instead of only fulfilling more traditional economic needs (Busch et al., 2018).

Due to these severe sustainability challenges we are facing, there has been a growing discussion in the literature about the integration of sustainability and sustainable development goals (SDGs) into management education (Figueiró & Raufflet, 2015; Figueiró et al., 2022). However, advanced understanding about the pedagogical integration, i.e., how to fully incorporate sustainability into a curriculum and course design and implement it in practice is still called for (Figueiró & Raufflet, 2015). As Figueiró et al. (2022, p. 1) emphasize "there is a mismatch between the highlighted importance of education for sustainability and the actual implementation of its integration in HEIs [higher education institutions] due to its multifaceted characteristics and complexity." Furthermore, even though some theories have been presented on how knowledge management and sustainability are intertwined (e.g., Chopra et al. 2021), the question of how to integrate sustainability into information and knowledge management (IKM) curriculum has not been addressed in the literature.

For these reasons, this study aims to answer the research question of *how to integrate sustainability into information and knowledge management curriculum and course design, and what kind of opportunities and challenges relate to this curriculum development*. The empirical study is conducted in the Finnish university that holds the Degree Programme in Information and Knowledge Management. The action-oriented case study research methodology is applied and different sources of data are used from participatory observation to interviews.

This article proceeds as follows. Section 2 deals with sustainability in the context of higher and management education, and furthermore, especially in information and knowledge management education. It reviews the previous literature and analyses the key implementation aspects when integrating sustainability into management education. In Section 3, the study context and the method are

presented. Results are described and discussed in Section 4. First, the current state of integration of sustainability in the information and knowledge management curriculum is described, followed by one course example of implemented integration at the curriculum. After that, the future opportunities of integration are described in more detail, and different means for integration, where sustainability is interwoven within different courses of the curriculum, are identified. Section 5 draws conclusions.

2. Sustainability in higher and management education

The question of what should be taken into account when integrating sustainability into higher and management education has been discussed from different perspectives. Figueiró et al. (2022) identify four interdependent dimensions to consider in integration: contextual, organizational, curricular, and pedagogical. From the perspective of the curriculum dimension, it is possible to evaluate whether the subject of sustainability is mandatory or elective, how it is present in the curriculum (whether disciplinary or cross-, inter- or multidisciplinary), and what is its relevance to research projects and extension projects (partnerships with different stakeholders) (Figueiró et al., 2022). There are different ways to integrate sustainability into management curriculum, and the curriculum orientation (i.e., how and where sustainability is located in the curriculum) may vary from stand-alone course/module or new course/program to cross-disciplinary, interdisciplinary, multidisciplinary and transdisciplinary perspectives (Figueiró & Raufflet, 2015). Because holistic and integrated view is crucial in sustainability teaching, the practice where different fields come together to teach sustainability (multi- and interdisciplinary) and stakeholders outside the academia are involved (transdisciplinary), is identified as an ideal way for integration (Figueiró & Raufflet, 2015; Annan-Diab & Molinary, 2017).

Horizontal integration, where sustainable development is interwoven within different courses of the curriculum, is generally favored, and deemed ideal as compared with the vertical integration, which can be understood as the organization of separate sustainable development courses within the curriculum (Ceulemans and De Prins 2010). There is rather strong consensus in the literature that sustainability should be embedded in the whole curriculum and core courses as a built-in approach (and not appear only in specific courses in marginal way) to support learning of this multifaceted issue (Figueiró & Raufflet, 2015; Figueiró et al., 2022).

Information and knowledge management in the context of sustainability is still little explored area and for example, the research fields of knowledge management and sustainable development are quite separate from each other (Martins et al., 2019). However, the curriculum of information and knowledge management is an intriguing context for applying sustainability: sustainable development with multiple perspectives and actors (multiple kinds of knowledge and ways of knowing) provides a meaningful context in where to apply IKM, and IKM has been presented as a tool/solution for achieving sustainability (Caiado et al., 2018). Also, Chopra et al. (2021), who propose a theory of knowledge management for sustainability to provide a foundational understanding of how knowledge management and sustainability are intertwined, describe in their model how knowledge management at the individual and firm-level (consisting of knowledge creation, acquisition, sharing, application, and transfer) will lead to sustainability outcomes at the country level. On the other hand, the concept of sustainability changes many previous assumptions and there are tensions in the sustainability-business nexus (Figueiró & Raufflet, 2015), such as the egocentric, company focused, linear economy perspective, the dominance of the economic interests and the focus on short-term. These subtler changes may be much harder to incorporate into a curriculum, and the question of how the sustainable IKM education should relate to both knowledge, skills, and values in order to provide sustainability-specific learning outcomes, emerges.

3. Research context and method

The action-oriented case study was implemented in the Finnish university related to the curriculum of information and knowledge management (IKM). The unit that is responsible for the curriculum has three focus areas of research: knowledge-based management, management of information systems, and management of digital business, and through these areas it aims to create value from knowledge by combining technology, people and business. The curriculum consists of bachelor's and master's degree programmes. Master's programme currently contains three study modules: knowledge management, information systems management, and transport and logistics management, which partially follow the research area focuses of the unit. The author of this paper had a dual role as the teacher and developer of the sustainability-focused course and the curriculum and as researchers studying the curriculum and course design development work.

For this study, data was gathered by participatory observation in the curriculum development work for the academic years 2024–2027, interviewing key persons (n=3) responsible for and familiar with

the IKM curriculum, and by observing and reflecting the development work of the IKM graduate course on "Knowledge-based and Collaborative Decision Making for Sustainability" and its six implementations in the academic years 2020–2023. It should be noted that the curriculum development work for the academic years 2014–2017 started in the fall of 2022 but continues at the time of writing this paper (in April 2023). One of the general goals of the curriculum work is that the principles of sustainable development should be embedded in all degree programs. Sustainability is strongly present in the university's strategy and the rector's decision to integrate sustainability into all degree programs guides the curriculum development work.

4. Results and discussion

4.1. Current state of integration of sustainability in the information and knowledge management curriculum

Sustainability is not extensively visibly present in the current information and knowledge management curriculum. However, two exceptions exist. First, in the bachelor's degree, an option is presented for choosing a course on sustainable development, but it is not mandatory and only few students choose that course. Second, in the master's programme, the study module of knowledge management includes a mandatory course "Knowledge-based and Collaborative Decision Making for Sustainability" (5 ECTS), that is an information and knowledge management specific course about sustainability. In addition, it is possible that there exist sustainability themes in the courses, but they have not been made visible. Furthermore, there are opportunities for choosing sustainability-themed minor subjects related to, for example, circular economy. All in all, there is a lack of full integration of sustainability into the curriculum.

The key development idea behind the course "Knowledge-based and Collaborative Decision Making for Sustainability" was to develop an information and knowledge management specific course about sustainability including contents that are especially relevant to the IKM students. The other key idea was to create a multidisciplinary course that would offer systemic and holistic understanding and pragmatic, theory-based tools and solutions to sustainability (Table 1). The course was developed by two teachers from different faculties/units interested in the topic. Altogether six implementations of the course have been held (and test rounds). Teachers' diverse background in environmental engineering, management, and social sciences has provided a good background for implementing a multidisciplinary approach in the course. From the perspective of sustainability integration, the course has worked well by supporting the idea of horizontal integration and multidisciplinary approach. Besides developing this course further, sustainability-themed courses could be developed to the other research focus areas (management of information systems, management of digital business). This would support the integration of sustainability into all focus areas of IKM.

Table 1. The contents of the course "Knowledge-based and collaborative decision-making for sustainability".

Design principles	**Themes**	**Tasks**	**Learning outcomes**
Multidisciplinary Collaboration and interaction Systemic and holistic approach	I Collaboration for system-level sustainability 1. Collaborative approach to negotiations 2. Sustainability and Environmental Impacts 3. Stakeholder engagement and cross-sector collaboration for sustainability II Transforming business for system-level sustainability 4. Business Tools for Sustainability 5. Managing Information and Knowledge for Sustainability 6. Sustainability Leadership	▪ Negotiation exercises ▪ Group discussions ▪ Essays ▪ Project work ▪ Introductory and synthesis lectures ▪ Guest lectures ▪ Lecture videos and related Moodle-exams	*Planetary boundaries* *Systems thinking* *Collaboration* *Sustainability-target driven business* *Knowledge and leadership to support transformation*

4.2. Future of integration of sustainability in the information and knowledge management curriculum

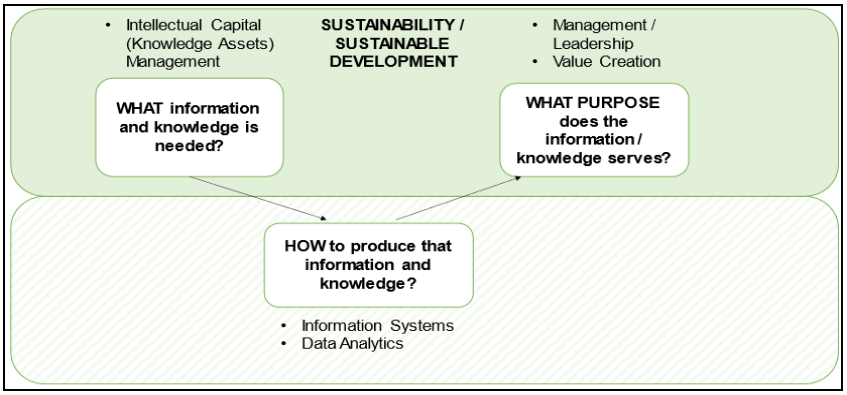
The means to integrate sustainability into information and knowledge management curriculum that have been brought up in the interviews and in the curriculum development work are summarized in Table 2. In addition, it was highlighted that in the transition phase, dedication is needed. Later, when sustainability is embedded in the curriculum, visible attention is no longer needed. Furthermore, the future-oriented and student-centered perspective should be adopted in the development work because curriculum work has far-reaching implications.

Table 2. Means to integrate sustainability into Information and Knowledge Management curriculum.

	Means	Strengths	Limitations
Vertical integration	**1. A basic course on sustainability mandatory for everyone** (e.g., a MOOC course)	A basic understanding of sustainability for everyone right at the beginning of their studies. Once a scalable course has been developed, it is easy to implement effectively and build on it more in later studies. Ensures the minimum standard – Basic understanding of the planetary situation (biodiversity loss, climate change)	If the scope of the course is limited (e.g., to 1 ECTS), it limits the contents and the learning goals. Bringing new content to a full degree is challenging because something needs to be taken away (giving up on some content is more difficult than creating new). As a stand-alone course, no ties to other courses.
Horizontal integration	**2. Information and knowledge management specific courses about sustainability on every study module** ("Knowledge-based and collaborative decision-making for sustainability" an example from one study module)	Supports the idea of horizontal integration and multidisciplinary approach, where "Different fields of knowledge come together to teach sustainability. Each discipline retains its own method and may be responsible for a different topic linked to the sustainability" (Figueiró & Raufflet 2015, 29).	Requires a deep understanding of sustainability and training of personnel
	3. Sustainability themes in the project works of the courses	Conducting case/project work is typical in information and knowledge management courses, so this would be impactful way. A way to keep the aim for sustainability high on the agenda and to create a general state of will, interest, commitment, and a favorable attitude towards action for sustainability.	Might remain superficial and generic approach.
	4. Identifying sustainability themes from the current courses and making them visible	A good first step that stimulates thinking about the theme.	Might remain superficial if no further critical analysis and development work is made.
Vertical or horizontal integration	**5. Strengthening the essential contents in the degree from the perspective of sustainable development** (e.g., systems theory and data analysis)	Strengthens substance areas those have great potential in helping to promote sustainability.	Sustainability needs to be interwoven into these courses as well.
	6. Engaging the student union, guilds, and students for the integration work	Possibility to create a general state of will, interest, commitment, and a favorable attitude towards action for sustainability among personnel, and support needed dedication in transformation.	Students may give incentives, but personnel should have to know-how about the substance.

The key questions and themes of information and knowledge management, and the contents on which sustainability affects most are described in Figure 1. The purpose of the figure is to emphasize those contents that are most impacted on by SDGs. The figure describes that presumably sustainability does not primarily change theories or methods that deal with the question of how to produce information and knowledge (such as models in information systems or data analytics), because methods stay somewhat the same independent of the type of knowledge that is handled. Whereas sustainability clearly changes the definition of information and knowledge needs (new/broader focus, wider understanding of the operational environment) and the use of the information and knowledge. So, the topics of management, leadership, and value creation that are related to the use of knowledge are especially affected by sustainability.

Figure 1. The relationship of information and knowledge management curriculum and sustainability.



5. Conclusions

This research contributes to the field of sustainability in higher and management education (Figueiró & Raufflet, 2015; Figueiró et al., 2022) by presenting a case study in the information and knowledge management curriculum about the sustainability integration. Future research could delve further into the question of how to achieve a deeper engagement with sustainability through the whole curriculum, and how to embed sustainability into the existing core courses of information and knowledge management.

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