

CASE STUDY OF DEVELOPING SUSTAINABILITY KNOWLEDGE IN THE TEXTILE AND FASHION INDUSTRY PILOT TRAINING: SOURCES OF SUSTAINABILITY INFORMATION AND SHIFTS IN INFORMATION-SEEKING BEHAVIOUR

Heidi Salokangas

*ICT and Industrial Engineering, Industrial Engineering and Common studies Turku
University of Applied Sciences/Senior Lecturer (Finland)
Doctoral Programme in Business and Technology Management, Doctoral Researcher,
Tampere University (Finland)*

Abstract

This study presents a case of sustainable development pilot training in the textile and fashion industry, called “JOSPA –What if we could find a new direction for sustainable development in the textile and fashion industry?”. The training has aimed to support the transition to employment as a craft entrepreneur or in industrial production. Pilot training consisted of eleven courses, from sustainable design and pattern making up to sustainable quality management in the textile industry, e-commerce and content production and intellectual property rights. The aim of this study is to investigate where participants in the textile and fashion industry pilot training acquire sustainability-related knowledge, identify the most frequently used sources, and examine whether their information-seeking practices changed during the training. In this qualitative case study, data were collected via open-ended questionnaires administered to participants through a learning management system. At the beginning of the training, there were 47 participants, 27 (55,3%) of whom responded to the 1st question of the initial survey. Eighteen months later, at the end of the training, 9 (19%) participants responded to the final survey. The initial survey data were collected in August 2023, and the final survey in February 2025. Thematic analysis was conducted to identify recurring topics and themes in responses. The preliminary findings indicate a slight shift toward more systematic sustainability of information-seeking practices following the training. This change highlights the importance of structured education in promoting source reliability and regulatory awareness within the textile and fashion industry. The results have implications for curriculum development and professional training programs.

Keywords: *Sustainability knowledge, sustainability, training program, case study, critical.*

1. Introduction

The share of textile waste in the EU going to landfills has dropped significantly, from 21% in 2010 to 12% in 2022. Meanwhile, incineration has become more common, rising from 10% to 15% during the same period, which equals about 100,000 tons per year. (Share of Textile Waste Sent to Incineration or Landfill in the EU, 2025) The EU has taken significant measures to reduce the adverse effects of the textile industry and launched several legal initiatives for brands to comply with. In 2019, the European Commission launched the Green Deal strategy, which led to an updated Circular Economy Action Plan (CEAP) in 2020, and a Strategy for Sustainable and Circular Textiles in 2022. This regulation tsunami has resulted in more than tens of directives, such as, but not limited to, Corporate Sustainability Reporting Directive (CSRD), Waste Framework Directive and regulations such as Ecodesign for Sustainable Products Regulation (ESPR). (Bartl, 2025; Garcia-Torea et al., 2024; Monseau et al., 2024) Since the changing regulatory landscape, it is evident that the actors in the field of textile and fashion do need to develop their sustainability knowledge both in practice and theory to comply with the upcoming legislation and strengthen their competitive advantage (Di Chiacchio et al., 2024; Doyle, 2007; Zakin et al., 2017).

Widely recognised concept of sustainable development was introduced by the World Commission on Environment and Development (1987) in the Brundtland Report *Our Common Future*. Its definition refers to development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability is seen as a cross section in social and ecological factors

considered in addition to economic ones, known as three pillars of sustainability (Purvis et al., 2019). Sustainability knowledge is defined as knowledge of sustainability principles, concepts and practices of sustainable development in the context of fashion and textile industry building on Klingenberg & Rothberg's (2020) discussion on sustainability knowledge.

1.1. The role of education advancing sustainability

Training particularly through e-learning is a key mechanism for reducing skills gaps and addressing sustainability demands in the textile and fashion industries (Avadanei et al., 2020). Recent studies emphasise renewing fashion education by embedding sustainability into teaching and design processes rather than treating it as a separate module (Jaiswal et al., 2024; Zakaria et al., 2022). In addition, Baeza et al. (2023) argue that training curricula should preserve existing good practices while remaining flexible enough to integrate future design thinking, experimental approaches, and ethically and sustainability-oriented business models.

Wood et al. (2023) found that attitudes toward alternative apparel materials, such as biofilm cultivated from tea, improved during practical workshops conducted with adults and secondary school children aged 11–12. Similarly, Jaiswal et al. (2024) showed that a scholarship programme significantly increased students' knowledge, skills, and attitudes toward cotton and sustainability; although attitudes were already positive, students initially had limited knowledge of sustainable textile practices. These findings highlight the importance of strategically embedding sustainable development themes into fashion and marketing education to strengthen students' competencies. Traumann et al. (2025) mapped future skill needs in the textile and fashion industry across Finland, Sweden, Estonia, Hungary, and Belgium and developed micro-credentials (1–2 credits) for education and business sectors to address identified skill gaps. While industry and student feedback focused on content and workload, the study does not explicitly report on the effects of these interventions.

Above mini-literature review (Pautasso, 2013) of recent works indicates that there is a need for further research on the effect of sustainability training programs on how adult learners in the training program acquire and apply sustainability-related knowledge. An adult learner (later referred to as student) is a person who has already completed a vocational or higher education degree and wants to further develop their skills in an open university (Adult Students, 2024). The aim of the research is to evaluate the critical assessment of the shifts of information-seeking, students attending the JOSPA pilot training program. The research question: How did participants in the training program acquire and apply sustainable-related knowledge? It focuses on one aspect: Information sourcing – where participants acquired sustainability information relevant to their field.

2. The Case of textile and fashion industry pilot training

The sample for this study consisted of students at the Open University of Turku University of Applied Sciences (TUAS) with an enrollment of 47 students. This study included students who attended the JOSPA training program, which was designed and co-taught jointly by Turku University of Applied Sciences and Turku Vocational Institute (TAI), between 1 January 2023 and 28 February 2025. The training was funded by the Service Centre for Continuous Learning and Employment (SECLE), which was, at the time of granting the funding, a newly established (2021) governmental organization unit for the Agency reporting directly to the Ministry of Education and Culture and the Ministry of Economic Affairs and Employment in Finland.

The training aimed to support adult learners in gaining employment either as craft entrepreneurs or in industrial production roles. In addition, the training aimed to improve participants' skills and their employment opportunities, particularly among individuals in a weak labour market position. The purpose of the training was to promote skills development in both growth sectors and sectors with a labour surplus. The program emphasised income generation and skills development. It responded to the visible skills shortage and mismatch in the textile industry (Avadanei et al., 2020). Pilot training consisted of eleven courses 5 cr of each resulting in total 55 cr: Sustainable design and planning, sustainable production planning, sustainable quality management in the textile industry, sustainable and high-quality sewing techniques, sustainability standards and ethical labels, sustainable supply chain management in international trade, sustainable materials, sustainable e-commerce and content creation, sustainable and cost-effective project management, from waste material to profitable product – product development project and intellectual property rights.

Kolb's (1984) Experiential learning theory was used to build a holistic learning process for the students, where the learning is defined as “the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience” (Kolb 1984, p. 41; Kolb et al., 2014) together with the GreenComp: the European Sustainability

Competence Framework (European Commission. Joint Research Centre, 2022). The courses consisted of theoretical lectures lectured by TUAS Master School (EFQ level 7) Sr. Lectures (the author being one) and principal lectures and vocational field of studies taught by vocational teachers at TAI (EFQ level 4–5) and students' hands-on work. Working life representatives (such as tacit knowledge of Grafis CAD software or material recycling) were used to bring up-to-date knowledge from the field of fashion and textiles. Example, the GreenComp area embracing complexity in sustainability and competence of critical thinking was emphasised via learning diaries, audit, and project plans, which encouraged students to critically evaluate what they had learned and to consider how the knowledge could be applied to their own work (European Commission. Joint Research Centre, 2022). All pillars of sustainability were introduced in all courses both in theory and in practices via lectures and practical workshops from zero-waste pattern drafting up to sustainable project management.

The lectures were delivered both in class and online simultaneously (streamed via Teams), so that students all over the Finland could participate, and lectures were held mainly outside the office hours and during the weekends. No prerequisites from the textile and fashion industry were required prior to attending the training. The only requirement was that students who selected distance learning needed to have access to applicable equipment such home sewing machines and computers with the possibility to install open-source programs. The average number of contact lessons was 16 hours out of 135 per course, and the learning management system was used for communication, assignments, and grading.

3. Results

In this qualitative case study, data was collected via open-ended questionnaires administered to participants through a learning management system. At the beginning of the training, there were 47 participants, 26 (55,3%) of whom responded to the 1st question of the initial survey. Eighteen months later, at the end of the training, 9 (19%) participants responded to the final survey. The initial survey data were collected in August 2023, and the final survey in February 2025. Thematic analysis was conducted to identify recurring topics and themes in responses (Nowell et al., 2017).

3.1. Where do participants acquire sustainability information relevant to their field?

This chapter examines where the participants in the pilot training obtained information related to sustainability and which sources were most used. It also analyzes whether there were any changes in information-seeking practices during the training.

3.1.1. Where do you get information about sustainability in the textile and fashion industry when you need it?

Before: The most common way to obtain information on sustainability was through searches on the websites of various organisations. Key sources included non-profit associations such as Suomen Tekstiili ja Muoti (Finnish Textile and Fashion), Pro Ethical Trade Finland (Eetti), Suomalaisen Työn Liitto (Association for Finnish Work), and Finwatch. Information was also gathered from educational institutions, including vocational schools (e.g., Raseko) and universities (e.g., Aalto University), as well as from

well-known textile industry projects such as Telaketju, Telavalue, and Finix. Furthermore, few students reported consulting research entities such as Sitra, reading dissertations, and both international and domestic research reports, and following sustainability influencers on social media. Additional sources included websites of textile and clothing manufacturers, certification and sustainability reports, and inquiries made to fabric stores. Students employed in textile and fashion companies mentioned leveraging their professional networks, including former colleagues, and obtaining information from agents and fabric retailers. In addition to websites, the study drew on multiple media sources, including academic literature, articles, news, reports related to European union data and legislation, national television channels, webinars, seminars, and podcasts.

After: Information is mainly obtained from the internet using search engines. Key sources include the website of the Finnish Textile and Fashion Association, other textile and fashion industry websites, and industry publications, which provide up-to-date information and links to the latest reports and studies. The information is also supplemented with course materials and training. Initially, the search for information focused on social media, but with training, the sources have expanded to include official and reliable databases such as Finlex and Edilex. In addition, regulations, scientific studies, and information produced by reliable organisations are utilised.

3.1.2. List the three sources you use most often to obtain information about sustainability issues related to the textile and fashion industry. **Before:** The Finnish Textile and Fashion Association and related industry organisations' websites (10 out of 64 mentions) ranked among the three

most frequently used sources of responsibility information, followed by responsibility influencers and blogs (9 out of 64 mentions). Company sources (5 mentions) and educational institutions (5 out of 64 mentions) constitute a clearly smaller, supplementary source of information. The number of students who replied to this was 25/47. After: The three most used responsibility information is primarily obtained through the Finnish Textile and Fashion Association's website (7 out of 25). In addition, information is obtained from the social media content of monitored responsibility experts and influencers (e.g., Paula Malleus, Outi Pyy (3 out of 25 mentions), as well as from companies' own sources and partners (2 out of 25 mentions). Number of students who replied this was 9/47

4. Conclusion

The preliminary results indicates that after training, information gathering continued to rely on same established institutions in the field than before training—particularly the Finnish Textile and Fashion Association, supplemented by selected sustainability experts and influencers, as well as companies' own and partner sources. However, findings also suggest a slight shift towards more structured, reliable, and practice-oriented use of information. This raises questions about how these evolving practices influence decision-making and long-term organisational sustainability strategies. Future research could explore the durability of these changes and their impact on operational outcomes but also explore why certain sources are perceived as trustworthy, how the acquired knowledge influences participants' actions, and in what ways this knowledge is applied in practice, such as changes in work processes, organisational practices, or communication strategies. Preliminary further findings suggest that with training, information retrieval has evolved from a multi-source and somewhat informal practice to a systematic, search engine-mediated, and institutionally validated process that emphasises official databases, regulatory information, and scientific research.

Acknowledgments

The training has been funded by the Service Centre for Continuous Learning and Employment (SECLE). The Service Centre promotes the competence development of working-age people and the availability of skilled labour. The operations of the Service Centre are overseen by the Ministry of Education and Culture and the Ministry of Economic Affairs and Employment. The researcher participated in the S4M project conducted at Turku University of Applied Sciences and funded by Business Finland.

References

- Adult students. (2024). In *Finto—Finnish Thesaurus and Ontology Service*. National Library. Retrieved from <http://www.yso.fi/onto/yso/p25875>
- Avadanei, M., Olaru, S., Ionescu, I., Ursache, M., Ciobanu, L., Alexa, L., ... Silva, C. (2020). ICT new tools for a sustainable textile and clothing industry. *Industria Textila*, 71(05), 504–512. doi: 10.35530/IT.071.05.1811
- Bartl, A. (2025). A tsunami in the textile industry: How Europe's lawmakers are re-threading fashion. *Waste Management & Research: The Journal for a Sustainable Circular Economy*, 43(12), 1909–1911. <https://doi.org/10.1177/0734242X251391766>
- Baeza, C., Corcoran, S., & Quinn, E. S. (2023). Curriculum: Challenges, opportunities, and approaches to increasing sustainability content in fashion and textiles education. In *Accelerating Sustainability in Fashion, Clothing and Textiles* (pp. 315–330). Routledge. doi: 10.4324/9781003272878-32
- Di Chiacchio, L., Martínez-Caro, E., Cegarra-Navarro, J. G., & Garcia-Perez, A. (2024). Eco-innovation in the textile industry: The strategic importance of data privacy and environmental knowledge management. *Kybernetes*, 53(10), 3444–3461. doi: 10.1108/K-02-2023-0222
- Doyle, E. (2007). Compliance obstacles to competitiveness. *Corporate Governance: The International Journal of Business in Society*, 7(5), 612–622. doi: 10.1108/14720700710827194
- European Commission. (2020). Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of the regions. *A new Circular Economy Action Plan For a cleaner and more competitive Europe*. Pub. L. No. COM/2020/98 final (2020).

- European Commission. Joint Research Centre. (2022). *GreenComp, the European sustainability competence framework*. LU: Publications Office. Retrieved from <https://data.europa.eu/doi/10.2760/13286>
- Garcia-Torea, N., Luque-Vílchez, M., & Rodríguez-Gutiérrez, P. (2024). The EU Taxonomy, sustainability reporting and financial institutions: Understanding the elements driving regulatory uncertainty. *Accounting Forum*, 48(3), 427–454. <https://doi.org/10.1080/01559982.2024.2364953>
- Jaiswal, G., Hopfer, E. N., & Dixon, D. L. (2024). Sowing the seeds of change: Educating emerging textile and apparel professionals on sustainability from cotton industry perspective. *International Journal of Sustainability in Higher Education*, 25(3), 649–668. doi: 10.1108/IJSHE-08-2022-0282
- Klingenberg, B., & Rothberg, H. N. (2020). The Status quo of Knowledge Management and Sustainability Knowledge. *Electronic Journal of Knowledge Management*, 18(2). doi: 10.34190/EJKM.18.02.004
- Kolb, D. A. (1984). *Experimental learning: Experience as the source of learning and development*. Englewood Cliffs, N.J: Prentice-Hall.
- Kolb, D. A., Boyatzis, R. E., & Mainemelis, C. (2014). Experiential Learning Theory: Previous Research and New Directions. In R. J. Sternberg & L. Zhang (Eds), *Perspectives on Thinking, Learning, and Cognitive Styles* (0 edn, pp. 227–248). Routledge. doi: 10.4324/9781410605986-9
- Monseau, S., Sorsa, K., & Salokangas, H. (2024). Cleaner Clothes: The EU Textile Strategy and Sustainability in the Textile Supply Chain. *The Georgia Journal of International and Comparative Law*, 52(2).
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, 16(1), 1609406917733847. doi: 10.1177/1609406917733847
- Pautasso, M. (2013). Ten Simple Rules for Writing a Literature Review. *PLoS Computational Biology*, 9(7), e1003149. doi: 10.1371/journal.pcbi.1003149
- Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: In search of conceptual origins. *Sustainability Science*, 14(3), 681–695. doi: 10.1007/s11625-018-0627-5
- Share of textile waste sent to incineration or landfill in the EU. (2025, March 19). Retrieved December 10, 2025, from <https://www.eea.europa.eu/en/circularity/sectoral-modules/textiles/share-of-textile-waste-sent-to-incineration-or-landfill-in-the-eu>
- Traumann, A., Amgwerd, M., Karell, E., Mäkelä, M., Vasile, S., & Höijer, A.-C. (2025). Flexible Lifelong Learning Pathways in the Textile and Clothing Sector Through Micro-credentials. In M. E. Auer & T. Rüttnann (Eds), *Futureproofing Engineering Education for Global Responsibility* (Vol. 1261, pp. 589–600). Cham: Springer Nature Switzerland. doi: 10.1007/978-3-031-85649-5_58
- Wood, J., Redfern, J., & Verran, J. (2023). Developing textile sustainability education in the curriculum: Pedagogical approaches to material innovation in fashion. *International Journal of Fashion Design, Technology and Education*, 16(2), 141–151. doi: 10.1080/17543266.2022.2131913
- World Commission on Environment and Development. (1987). *Our Common Future*. UN. Retrieved from <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>
- Zakaria, N., Vouyouka, A., & Ruznan, W. S. (2022). Sustainable apparel technical and vocational education and training (TVET): Integrating technology for skills training. In *Digital Manufacturing Technology for Sustainable Anthropometric Apparel* (pp. 3–21). Elsevier. doi: 10.1016/B978-0-12-823969-8.00003-4
- Zakin, M., Stanisavljev, S., Pečurlija, M., Markoski, B., Mitrović, V., & Vlahović, M. (2017). Impact of the Educational Attainment of the Knowledge Management Process in Serbian Textile Enterprises. *Fibres and Textiles in Eastern Europe*, 25(0), 14–19. doi: 10.5604/01.3001.0010.1683