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Innovative Skills for an Old Vocation – Which Sub-Dimensions of Globalisation, Digitalisation and Sustainability Are of Relevance for Which Spheres of Activity?

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Abstract

Context: As all sectors, the sector of industrial footwear production faces the mega-trends of globalisation, digitalisation and sustainability. Many studies on these trends refer to the meta-level, an example might be the study conducted by Jeske et al. (2021), who stated for the German metal and electrical industry increasing "Qualification requirements for skilled workers" due to digitalisation (p.378). Findings like the one quoted are published broadly for all three trends and lead to enormous uncertainties among workforce; skilled workers are asking their foremen and themselves: "What does this mean for my workplace?"

Skilled work in the sector of industrial footwear production can be described by 18 Spheres of Activity (SoA), and this paper aims at discerning those SoA, that are affected most by the different sub-dimensions of the trends (for example: collaborative robots as sub-dimension of digitalisation).

Approach: Desk research was undertaken to figure out the potential sub-dimensions, which were summarised in three matrices (one for each trend). The matrices have been filled in with the experienced or expected developments in nine expert-workshops.

Findings reveal, quite surprisingly, that classic "blue collar" SoA like "cutting" are expected to stay more stable than "white collar" SoA like "design".

Conclusions: The findings drafted below hopefully help to reduce the uncertainties about the consequences of the trends for workplaces and business processes among workforce and small and medium (SME) companies in the sector of industrial shoe production – and serve as basis for fitting continuous education and training where needed.

Keywords

digitalisation, Globalisation, Sustainability, Industrial Footwear Production

1 Introduction, background and research questions

The conceptual aim of this paper is not to question the serious impacts of the trends of globalisation, digitalisation and sustainability, but to ground them via breaking down the sub-dimensions of the trends to the Spheres of Activity (SoA) of a chosen sector, the industrial footwear production. In our previous projects ICSAS and DIA-CVET it was concluded that skilled work of colleagues qualified via Initial Vocational Education and Training (IVET) can be described by 9 SoA (ICSAS 2020) and those of colleagues qualified via Continuous VET (CVET) or Higher Education (HE) by 13 SoA (DIA-CVET 2023). Some SoA like "quality assurance" appear in both lists, as colleagues from various educational levels are working in these SoA; thus skilled work in the whole sector can be described by 18 SoA.

The concrete aim of this research is to develop and fill-in three matrices, where each x-axis consists of the 18 SoA, and the 3 y-axes y_1 (sustainability), y_2 (globalisation) and y_3 (digitalisation) of the dimensions respective sub-dimensions of the trends.

Research is undertaken in the three countries participating in the current Erasmus+ project ISOV (ISOV 2025)[1]: Germany, Portugal and Romania.

Following the thoughts outlined above, two research questions are answered:

* Q1: Which are the potential dimensions and sub-dimensions of the 3 trends that could influence skilled work in one of the SoA?

* Q2: Which of the potential sub-dimensions have a concrete impact on any of the 18 SoA?

2 Method

2.1 Desk research

To figure out the potential dimensions for the y-axes, basically desk-research was undertaken. Authors like Pfeiffer et al. (2017, p.14), who pursued a comparable approach for

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the trend of digitalisation in metal industry, were examined. Additionally, findings of projects with similar aims (e. g. Metaskills4TCLF 2024), were taken into account.

2.2 Expert-Workshops (EWS)

The WS rely on an iterative approach: Always starting with empty matrices; however, when the experts have negotiated their estimations, any available results from previous WS were presented and the experts were invited to comment on the estimations given by participants in prior EWS. The row of EWS came to an end, when a certain saturation was reached and no additional information was expected any-more. Overall, nine EWS (three in each country) were undertaken, each with ~ ten participants. Participants were chosen (and considered as experts), when the either had vast experience in working in the sector or are specialised in one of the trends, ideally both. (A participating company has an own department focussing on sustainability and supply-chain management in industrial shoe production.

1 Findings

2.3 The three y-axes of the matrices

Desk research was undertaken in winter 2024/2025 and revealed, that the number of potentially influencing sub-dimensions of the three trends is quite large; thus, it was decided that each trend can be described by five or six dimensions; and each of these dimensions summarises three to seven sub-dimensions. As examples, table 1 summarises the dimensions of the trend “sustainability”; table 2 the sub-dimensions of the dimension “green awareness”, including a short description of each sub-dimension.

Table 1
Dimensions of Sustainability

Green awareness
Energy and process efficiency
Resource efficiency & Sustainable materials
Sustainable design & Circular economy
Chemical safety
Social responsibility

Table 2
Sub-dimensions of “Green Awareness”

Sustainability education & consumer empowerment	Providing training for employees and consumers about sustainable practices in footwear manufacturing and use. Sustainability education ensures stakeholders understand the environmental impacts of their actions, fostering eco-conscious behavior. Ensuring that consumers have access to clear, accurate, and meaningful information about the environmental, social, and ethical aspects of footwear products. This subdimension aims to empower consumers to make informed purchasing decisions that align with their values and sustainability goals, namely sustainable consumption.
Industry partnerships	Collaborating with NGOs and green organisations to promote sustainable practices. Partnerships amplify the industry's efforts to raise awareness and enhance sustainability standards.
Eco-labeling for footwear &	Clear and certified environmental labels for shoes. Certified eco-labels provide transparency, helping consumers easily identify sustainable options and discouraging deceptive greenwashing practices.

digital transparency	Blockchain technology ensures traceability and transparency, providing consumers with verifiable information about product origins and sustainability. Apps showing product lifecycle impact. Interactive digital platforms provide detailed insights into a product's environmental footprint, enabling informed consumer choices. An example is Digital Product Passport (DPP), a digital identity card for products, components, and materials, which will store relevant information to support products' sustainability, promote their circularity and strengthen legal compliance.

The dimensions of the other two trends, "digitalisation" and "globalisation", as well as all sub-dimensions (incl. short descriptions) can be consulted via the project webpage https://isov-project.eu/results/.

2.4 The fields of the matrices

The expert workshops were performed in spring 2025 and delivered rich, manifold and partly divergent results. Divergences might be explained by the different industrial structures in the three countries Germany, Romania and Portugal. Differing from the latter two countries, due to labour costs, production plays a minor role in Germany.

Quite similar, valid for all trends and all countries; huge impacts on the SoA "design", "training management", "sustainability management" and "supply change management" are expected.

In contrary, for the SoA "maintenance management" and the five "blue collar" SoA "cutting", "stitching", "lasting", "assembly" and "finishing" only minor impact is to be expected. The latter might seem astonishing, but it was often argued, that, for example, "waste reduction is already in place due to economic reasons" or that robots are good in handling solid materials like metals – but poor in working with soft materials like leather or elastics.

Regarding the details, again many similar estimations have been raised: For example, experts from all countries expect new production regulations in the SoA "assembly" due to innovative, environmental-friendly, glues.

But also differences between the countries occurred: Whilst, for example, Romanian experts see minor direct impact of the sub-dimension "Sustainability – education & consumer empowerment" on the SoA "stitching", "lasting" and "assembly", German experts expect, that skilled workers should be trained to treat the machines more carefully – to increase life-span and reduce maintenance needs. Analysis is ongoing, will be published on the project webpage by the end of 07.2025 and will be presented in Belgrade at the ECER 2025.

2 Outlook

The context in which this little piece of research was undertaken is the Erasmus + project ISOV. As most Erasmus+ projects, it aims basically at mutual learning, joint development of training materials, piloting the materials and evaluating the piloting.

The authors hope that the findings drafted above help reduce the uncertainties about the consequences of the trends for their workplaces and business processes among workforce and small and medium (SME) companies in the sector.

Additionally, during the next project meeting on 09.2025., partners from each country will opt for those five out of the 18 SoA, where they expect the largest changes, develop training manuals for these five SoA, pilot and evaluate the training courses based on these materials.

Results of the evaluation will hopefully be presented at ECER 2027.

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Biographical notes

Dr Andreas Saniter is a senior researcher and the international research coordinator at the Institute for Technology and Education (ITB), University of Bremen. Educational background in physics, research interests in expertise development, transnational comparative research and policy learning. Sometimes desperate with technocratic EU policies and officers.

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Rita Souto is director of the Department for Training and Cooperation for Skills Development at CTCP – Centro Tecnológico do Calçado de Portugal. She’s 30 years of experience in Footwear Industry. She works as project manager and she has been participating in sectoral studies on identification of training needs, curricula and contents development, promotion and evaluation, and she is counsellor in the National Skills Council for the Fashion industry.

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