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D3.2: Qualitative Evidence Report on Skills Needs in the TCLF Industry

Erasmus+

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EXECUTIVE SUMMARY

Deliverable 3.2 of the AEQUALIS4TCLF project provides a detailed analysis of survey results and focus group discussions conducted in seven European countries: Croatia, Czechia, Finland, Lithuania, Netherlands, Serbia, and Slovenia. The objective is to identify skills gaps affecting the textile, clothing, leather, and footwear (TCLF) industries, highlighting specifically digital competences, sustainable practices, and essential transversal skills such as critical thinking, adaptability, and effective problem-solving.

The findings reveal significant structural issues within the sector. Most notably, there is a clear misalignment between existing educational curricula and the practical requirements of TCLF enterprises. Cooperation between educational institutions and industry remains limited, which hampers efforts to update curricula and implement responsive training. Stakeholders in both industry and education identified a critical gap in this collaboration, highlighting the need for more structured dialogue to ensure curricula better reflect actual workplace demands.

Furthermore, the attractiveness of TCLF industries to potential younger entrants is negatively affected by prevailing outdated perceptions and unclear career advancement opportunities. Combined with demographic challenges, particularly the ageing workforce, these factors significantly threaten the sectors' future competitiveness and resilience.

External factors, including rapid technological changes and stringent regulatory demands related to sustainability, further increase pressures on companies and education providers. These external drivers are reshaping skills requirements, making digital literacy, familiarity with advanced manufacturing technologies, and sustainable production practices increasingly essential.

In response to these challenges, stakeholders recommended several practical measures. First, curriculum updates that integrate contemporary digital tools and sustainability practices into education programmes are crucial. Second, establishing structured collaboration platforms between education providers and industry will enable alignment between training programmes and actual industry demands. Third, targeted communication and awareness campaigns should enhance the

sector's visibility and attractiveness among young people, particularly emphasising emerging career paths and modern industry conditions.

These findings and recommendations form the foundation for subsequent project actions, including targeted curriculum revisions, practical training programmes, and evidence-based policy proposals. The aim is supporting the sustainable development and enhanced competitiveness of the TCLF sectors across Europe.

CONTENTS

Executive summary.....	2
1 Introduction.....	6
1.1 Context.....	6
1.2 Purpose of the report.....	7
2 Methodology	9
2.1 Survey Methodology.....	9
2.2 Focus Groups Methodology	15
2.3 Analytical Approach.....	22
3 Survey and Focus Group Analysis	29
3.1 Comparison of Participants by Country.....	29
3.2 Comparison of Participants by Type of Institution	31
3.3 Comparison of Participants by Sector.....	34
3.4 Analysis of Educational Institutions.....	38
3.5 Analysis of Companies	53
3.6 Analysis of Drivers of Change.....	66
4 Convergence of Findings.....	80
4.1 Curriculum and Industry Misalignment.....	80
4.2 Digital Competence Deficit.....	81
4.3 Sustainability and Green Skills	81
4.4 Transversal Skills Importance	82
4.5 Sector Attractiveness and Workforce Challenges.....	83
4.6 Demographic and Inclusivity Challenges.....	84
4.7 Need for Structured Collaboration Platforms	85
4.8 Drivers of Change in the TCLF Sectors.....	86
5 Conclusion.....	89
6 Annexes	91
6.1 Survey Questions	91
6.2 Survey Responses.....	100
6.3 Focus Groups.....	100

TABLE OF FIGURES

Figure 1 – Crucial skills most lacking in current graduates	40
Figure 2 - Areas where current curricula fail to meet industry standards.....	41
Figure 3 - Changes in skill requirements anticipated over the next 5–10 years	42
Figure 4 - How institutions are preparing to integrate future skills into existing curricula ...	44
Figure 5 - Extent of new technology integration in curricula	45
Figure 6 - Types of new technologies adopted in educational programmes	46
Figure 7 - Main barriers to adopting new technologies in curricula.....	47
Figure 8 - Current mix of online and in-person training	48
Figure 9 - Effectiveness of current curricula in preparing students for TCLF careers.....	49
Figure 10 - Curriculum integration of current technologies and innovations.....	50
Figure 11 - Collection of industry feedback on training programmes	51
Figure 12 - Methods used by institutions to gather industry feedback.....	52
Figure 13 - Main barriers to applying industry feedback in curricula.....	53
Figure 14 - Companies size	54
Figure 15 - Distribution of company operations across the TCLF supply chain	55
Figure 16 - Essential skill sets for current operations.....	56
Figure 17 - Anticipated skills needs over the next 5–10 years	57
Figure 18 - Company views on the adequacy of HE/VET training provision.....	58
Figure 19 - Communication channels between companies and education providers.....	59
Figure 20 - Company initiatives to promote gender balance	60
Figure 21 - Gender representation in the TCLF workforce	61
Figure 22 - Gender representation in leadership roles	62
Figure 23 - Employment of foreign workers.....	63
Figure 24 - Policies and practices to support migrant workers.....	64
Figure 25 - Ethnic diversity in the workforce.....	65
Figure 26 - Ethnic diversity in leadership roles	65
Figure 27 - Impact of regulations and governance on the TCLF sectors	68
Figure 28 - Environmental change as a driver of transformation in the TCLF sectors	70
Figure 29 - Perceived impact of economic and globalisation-related factors on the TCLF sector	71
Figure 30 - Impact of technological change in TCLF.....	73
Figure 31 - Perceived impact of demographic and population change on the TCLF sectors..	75
Figure 32 - Perceived impact of values and identity-related challenges on the TCLF sectors	77
Figure 33 - Perceived impact of evolving consumer preferences on the TCLF sectors	79

1 INTRODUCTION

1.1 Context

The European textile, clothing, leather, and footwear sectors are undergoing significant transformations driven by digitalisation, sustainability imperatives, demographic changes, and evolving consumer preferences. These factors require substantial adaptations within enterprises, educational institutions, and policy frameworks. Although these industries hold substantial economic and cultural importance for Europe, they face challenges in adapting to new technological advancements and increasingly stringent sustainability regulations.

A prominent barrier for these sectors, particularly impacting small and medium-sized enterprises (SMEs), is the limited capacity to integrate advanced technologies and sustainable production methods due to resource constraints and insufficient access to specialised training. SMEs constitute the majority of the TCLF industry, making this limitation particularly problematic. Additionally, educational curricula and vocational training programmes frequently lag behind industry developments, resulting in a noticeable mismatch between workforce skills and the practical demands of the sector.

Furthermore, broader social issues continue to impact the industry's development, notably related to workforce diversity and inclusiveness. Persistent structural and systemic barriers inhibit the full participation of women, migrants, and other underrepresented groups. Consequently, these sectors are deprived of diverse perspectives and potential skills that are crucial for innovation and resilience in an increasingly globalised marketplace.

Given these interconnected challenges, the need to clearly identify and address critical skills gaps, technological adoption barriers, and structural issues has become increasingly important. Doing so will support the sustainable development, inclusiveness, and competitiveness of these sectors across Europe.

1.2 Purpose of the report

This report represents Deliverable 3.2 of the AEQUALIS4TCLF project, aimed specifically at providing qualitative evidence regarding current and future skills needs within Europe's TCLF industries. It is based on comprehensive data obtained through surveys and qualitative insights from structured focus groups conducted across seven European countries: Croatia, Czechia, Finland, Lithuania, Netherlands, Serbia, and Slovenia. These countries were chosen because they are represented in the project consortium, ensuring direct input from local industry, educational institutions, and other stakeholders. This configuration provides a representative starting point for understanding the wider European context, acknowledging that each of these nations faces distinct challenges and opportunities related to workforce development, technological integration, and sustainability in the textile, clothing, leather, and footwear sectors.

The report addresses four primary objectives:

- To systematically identify the specific digital and sustainability-related skills required for the future competitiveness and resilience of Europe's TCLF sectors.
- To evaluate key barriers faced by companies in adopting advanced digital technologies and sustainable practices.
- To investigate current structural and social obstacles limiting workforce diversity and participation, particularly affecting women and migrants.
- To propose strategic recommendations for updating educational curricula, enhancing industry-education collaboration, promoting workforce diversity, and improving training and career development strategies.

The deliverable's structure reflects these objectives. Initially, it clarifies the methodology, explaining the project's use of both surveys and focus groups for data collection. Following this, the analysis sections present insights gleaned from each research method, illustrating how workforce skills, digitalisation, sustainability, and diversity themes emerge in different national and institutional contexts. Finally, the conclusion integrates these findings and addresses the four stated objectives, offering practical suggestions for stakeholders in education, industry, and policy-making.

D3.2: Qualitative Evidence Report on Skills Needs in the TCLF Industry

The overarching aim is to guide curricular reforms and strategic initiatives that will enable Europe's TCLF industries to thrive in the face of shifting regulatory, technological, and market conditions.

2 METHODOLOGY

The methodology for this deliverable relied on two primary tools: an online survey and focus group discussions. These methods were designed to gather both quantitative data to identify trends and qualitative insights for contextual understanding. Together, they provided a foundation for analysing the skills needs, training gaps, and diversity challenges within the TCLF industries across seven European countries represented in the AEQUALIS project: Croatia, Czechia, Finland, Lithuania, Netherlands, Serbia, and Slovenia.

2.1 Survey Methodology

2.1.1 Objectives and Scope

The survey component of this study was designed to gather comprehensive insights into the skills gaps, training requirements, diversity challenges, and readiness for technological and sustainable transformation within the TCLF sectors. This approach was informed by the objectives of the AEQUALIS4TCLF project, particularly the need to assess the alignment between educational curricula and industry requirements and to identify critical skills gaps in green and digital domains.

The survey aimed to achieve several interrelated objectives: to explore diversity dynamics, including gender and ethnic representation; to understand companies' preparedness for emerging challenges such as sustainability and advanced technologies; and to capture perceptions of external drivers of change, including regulatory, economic, and consumer trends. These objectives were formulated to provide a proper foundation for skills needs assessments and gap analysis, as required by Work Package 3 (WP3) of the AEQUALIS4TCLF project.

The use of an online survey was considered the most appropriate data collection tool due to its ability to reach a broad audience across multiple European countries, ensuring geographical diversity and comprehensive stakeholder representation.

2.1.2 Survey Design

The survey was structured to capture both quantitative and qualitative data, ensuring a balanced and comprehensive analysis of the skills needs, training gaps, and diversity challenges in the TCLF sectors. The questionnaire was divided into four main sections:

1. **General information:** This section collected demographic and organisational data, including respondents' nationality, type of entity (e.g., VET/HE, company, association, or public authority), and sector (textile, clothing, leather, footwear). It also included questions on geographical representation to enable cross-country comparisons. The rationale for including this section was to contextualise the findings and to examine the influence of demographic and organisational factors on perceptions of skills needs and industry challenges.
2. **Academia (VET/HE) specific section:** This section targeted respondents from vocational education and training (VET) institutions and higher education (HE) providers. It explored skills gaps, curriculum relevance, technological integration, barriers to innovation, and feedback mechanisms from industry stakeholders. This section was designed to inform curriculum development and skills strategies by capturing educational institutions' perspectives on the alignment between current curricula and industry needs.
3. **Industry (companies) specific section:** This section focused on gathering data from companies representing all stages of the TCLF supply chain, including raw material extraction, production, assembly, retail, and recycling. It investigated critical operational and future skills, diversity practices, feedback loops with educational providers, and industry challenges, such as regulatory compliance and sustainability. The inclusion of this section was informed by the need to understand the industry's skills demands and the perceived effectiveness of existing educational programs in meeting these demands.
4. **Cross-cutting themes for all stakeholders:** The final section examined cross-cutting themes relevant to all stakeholder groups, including drivers of change such as environmental, technological, demographic, and economic factors. This section was designed to provide strategic insights into external influences on skills needs and workforce development, thereby aligning the study with the European Skills Agenda, the Pact for Skills and the recently announced Union of Skills.

To enhance the reliability and validity of the data, the survey used a combination of closed-ended questions (e.g., multiple-choice and Likert scales) and open-ended questions. Closed-ended questions facilitated quantitative analysis, enabling the identification of patterns and trends, while open-ended questions allowed respondents to provide detailed qualitative insights, capturing nuanced stakeholder perspectives.

2.1.3 Audience and Sampling

The survey targeted stakeholders across the value chain and educational spectrum in seven European countries: Croatia, Czechia, Finland, Lithuania, Netherlands, Serbia, and Slovenia. This selection was informed by the strategic objectives of the AEQUALIS4TCLF project, which seeks to address skills gaps and promote digital and green transitions within the TCLF sectors across diverse European contexts. The countries were selected to provide a representative sample of the European TCLF industry, capturing regional variations in skills needs, industry challenges, and educational practices.

Three main stakeholder groups were identified:

- **Companies:** Representing small, medium, and large enterprises across the TCLF value chain. This group was included to provide insights into current and future skills needs, industry challenges, and the effectiveness of existing educational programs from an operational perspective.
- **Educational institutions:** Including VET and HE providers responsible for shaping the future TCLF workforce. This group was selected to capture educational stakeholders' perspectives on curriculum relevance, technological integration, and barriers to innovation.
- **Sectoral associations and public authorities:** Offering policy and systemic insights relevant to skills development and workforce planning. This group was included to contextualise the findings within the broader socio-economic and policy landscape.

A purposive sampling strategy was employed to ensure representation across subsectors (textile, clothing, leather, footwear), company sizes (small, medium, large), and geographic regions. This non-probability sampling method was chosen due to its effectiveness in selecting participants with relevant expertise and experience, thereby enhancing the validity of the findings. Respondents were

recruited through the networks of AEQUALIS4TCLF project partners, leveraging existing stakeholder relationships to maximise engagement and response rates.

Despite the strategic advantages of purposive sampling, the study acknowledges potential limitations, including selection bias and limited generalisability. To mitigate these limitations, targeted outreach was conducted to underrepresented groups, ensuring a balanced representation of stakeholder perspectives across countries, sectors, and organisational types.

2.1.4 Data Collection and Tools

The survey was administered online between **July 10 and October 23, 2024**, using a multilingual platform (Microsoft Forms) to ensure accessibility in the native languages of all participating countries. An online format was selected for its scalability, cost-effectiveness, and ability to reach geographically dispersed stakeholders. Distribution channels included direct email invitations, project newsletters, and targeted outreach by project partners.

To enhance user experience and response rates, the online platform featured:

- **User-friendly navigation**, including progress indicators and conditional branching to tailor questions based on respondents' stakeholder group.
- **Automated data storage** in a centralised database, ensuring data integrity and facilitating subsequent analysis.

The survey garnered a total of **222 responses**, of which **164 were fully completed and valid for analysis** (see section 3.1.1)

2.1.5 Key Challenges and Mitigation

Conducting the survey for the AEQUALIS4TCLF project involved several challenges, reflecting the complexities of organising a multi-country, multi-stakeholder survey within the diverse contexts of the TCLF sectors. These challenges were anticipated and strategically addressed through targeted outreach, adaptive survey design, and strategic follow-up.

One of the primary challenges encountered during the survey phase was achieving **balanced geographical representation** across the seven European countries involved in the AEQUALIS4TCLF project: Croatia, Czechia, Finland, Lithuania, Netherlands, Serbia, and Slovenia. While the survey was

distributed using a multilingual online platform to maximise accessibility, the response rates varied significantly between countries. This variation was attributed to several factors, including:

- **Differences in stakeholder engagement levels**, influenced by country-specific industry dynamics, educational structures, and policy landscapes.
- **Network reach and influence of the project partners**, which varied depending on their strategic connections within the TCLF sectors in each country.
- **Cultural differences in survey participation**, where respondents in some countries were more willing to participate than others, reflecting varying attitudes towards research and data sharing.

To address this challenge, the project partners employed targeted outreach strategies, including:

- **Direct email invitations and personalised follow-ups**, leveraging the networks of the project partners to reach underrepresented stakeholder groups.
- **Strategic use of newsletters and social media channels**, adapted to the communication preferences of each country to enhance visibility and engagement.
- **Relaunching the survey in September 2024**, accompanied by intensified outreach efforts to **boost response rates** in countries with initially low participation.

Despite these efforts, some countries continued to have lower representation compared to others, potentially affecting the generalizability of the findings. To mitigate this limitation, the data analysis phase employed comparative analysis techniques to explore regional trends and differences, ensuring that the findings were context-sensitive and accurately reflected the stakeholder perspectives within each country.

The **timing of the survey launch**, which occurred in July 2024, coincided with the summer holiday period in Europe, leading to low initial participation rates. This challenge was particularly pronounced among stakeholders from educational institutions, where academic staff and administrative personnel were on holiday. The timing issue also affected industry representatives, whose operational schedules were impacted by the summer slowdown typical of the TCLF sectors.

To mitigate this timing challenge, the survey was relaunched in September 2024, accompanied by a renewed communication strategy that included:

- **Targeted reminders** sent via email to previously contacted stakeholders, encouraging them to complete the survey.
- **New outreach efforts**, including promotional materials distributed through industry associations and educational networks to reach a broader audience.
- **Extended deadline**, allowing stakeholders more time to participate once they returned from the holiday period.

This strategic relaunch significantly improved the response rate, resulting in a total of 222 responses.

During the initial stages of the survey, several **technical and design challenges** were encountered, impacting the integrity and consistency of the data collected. These challenges included:

- **Translation errors:** As the survey was administered in multiple languages to accommodate participants from seven countries, translation errors were identified in some of the early responses. These errors affected the clarity of certain questions, leading to inconsistent or incomplete responses.
- **Survey navigation and user experience:** Feedback from early respondents indicated that the survey design could be improved for better navigation, including clearer instructions and optimised conditional branching to tailor questions based on stakeholder categories.

To address these technical and design issues, the following corrective measures were implemented:

- **Translation review and correction:** The survey was reviewed and revised by bilingual project partners to correct translation errors and enhance the linguistic accuracy of the questions. Where necessary, affected respondents were contacted and invited to re-submit their responses using the revised version of the survey.
- **Improved survey design:** The online platform was optimised for user-friendly navigation, including clearer instructions, progress indicators, and better conditional branching to enhance the user experience.
- **Pilot testing and feedback incorporation:** A test was conducted with the partners and some stakeholders to identify and rectify any remaining technical issues before the full-scale relaunch.

These corrective actions significantly improved the survey's usability and data quality, ensuring a more consistent and reliable data set for subsequent analysis.

A potential challenge identified during the survey phase was **response bias** due to the overrepresentation of engaged stakeholders. As the survey was distributed through the networks of the project partners, participants may have been disproportionately engaged with TCLF sector issues, leading to selection bias. This was particularly relevant for topics related to digital skills and sustainability, where more proactive stakeholders were likely to participate.

To mitigate response bias and ensure balanced stakeholder representation, the following strategies were employed:

- **Purposive sampling strategy:** The project partners actively targeted a diverse range of stakeholders, including companies, educational institutions, and sectoral associations, to capture multiple perspectives across the value chain.
- **Triangulation with Focus Group data:** To validate and contextualise the survey findings, the quantitative trends were triangulated with qualitative insights from the focus groups, ensuring that the data interpretation was balanced and reflective of the broader TCLF sectors.

2.2 Focus Groups Methodology

2.2.1 Objectives and Role in the Research

The focus groups were designed to complement the survey data by providing in-depth qualitative insights into the skills needs, training gaps, and diversity challenges within the Textile, Clothing, Leather, and Footwear sectors. This qualitative approach was selected to capture the nuanced perspectives of key stakeholders, including industry leaders, educational providers, policymakers, and sectoral associations, whose views and experiences could not be fully captured through quantitative survey data alone.

The primary objective of the focus groups was to **validate and expand on the survey findings**, exploring underlying reasons behind quantitative trends and identifying contextual factors influencing skills needs and workforce challenges.

Additionally, the focus groups aimed to elicit stakeholder feedback on the survey results, particularly concerning skills gaps, curriculum alignment, and challenges related to the green and digital transitions. The focus groups also served to facilitate collaborative discussions among stakeholders,

encouraging the co-creation of actionable strategies for aligning educational curricula with industry needs.

The decision to use focus groups, apart from a well-used strategy in these types of projects, it also allows participants to interact, challenge each other's views, and co-construct meanings, leading to deeper insights into collective experiences and shared challenges. This was particularly relevant to the AEQUALIS4TCLF project, where the complex interplay of skills needs, technological integration, and diversity challenges required a nuanced and context-sensitive exploration.

2.2.2 Design and Structure

The focus groups were designed to facilitate in-depth discussions on key themes identified from the survey findings, including skills gaps, technology adoption, sustainability practices, and diversity challenges within the TCLF sectors.

Each focus group session was structured into three main phases:

1. Introduction:
 - Each session began with a 5–10 minute introduction, during which the moderator welcomed participants, outlined the objectives of the discussion, and set expectations regarding confidentiality and data use.
 - Participants were informed about the purpose of the AEQUALIS4TCLF project and the role of the focus groups in providing qualitative evidence for Deliverable 3.2.
2. Guided discussion:
 - The main discussion phase lasted **30–45 minutes** and was guided by a semi-structured question framework designed to elicit detailed insights on the following themes:
 - **Skills and education gaps:** Exploring perceived gaps in technical, digital, and soft skills, as well as mismatches between current curricula and industry needs.
 - **Technology adoption and integration:** Examining barriers to adopting emerging technologies such as Artificial Intelligence (AI), Virtual Reality (VR), and automation, and industry expectations for educational institutions.

- **Sustainability and circular economy:** Investigating challenges and opportunities related to sustainable practices, circular economy principles, and supply chain transparency.
- **Workforce diversity and inclusion:** Identifying challenges in attracting underrepresented groups (e.g., women, migrants) and proposing solutions to enhance workforce diversity and inclusiveness.
- **Feedback on survey findings:** Gathering stakeholder feedback on the survey results to validate quantitative trends and contextualise findings within real-world experiences.

The semi-structured framework ensured consistency across sessions while allowing flexibility to explore emergent issues raised by participants. This approach was particularly useful in capturing context-specific insights, as participants were encouraged to share experiences relevant to their organisational contexts.

3. Conclusion and debriefing:

- Each session concluded with a 5–10 minute wrap-up, where the moderator summarised key takeaways and invited participants to provide final reflections or clarifications.
- Participants were thanked for their contributions, and contact details were shared for any follow-up questions or clarifications. This debriefing process aimed to enhance participant satisfaction and maintain engagement for future project activities.

2.2.3 Participants and Selection Criteria

The selection of participants for the focus groups was handpicked by project partners from each of the seven European countries involved in the AEQUALIS4TCLF project. This approach ensured that the focus groups included stakeholders with relevant expertise and experience in the TCLF sectors.

The participants were selected to represent a diverse range of perspectives, including industry leaders, educators, policymakers, and sectoral associations, who could provide informed feedback on the survey findings and offer strategic insights into skills gaps and workforce challenges.

The focus groups were predominantly conducted by non-academia partners, including industry associations and trade organisations, who played a central role in inviting stakeholders from their extensive networks. However, academia partners from the project also supported and engaged in these sessions, leveraging their educational expertise to contextualise the discussions within the framework of curriculum development and skills strategies.

Participants were selected to ensure representation from:

- **Industry stakeholders:** Including small, medium, and large enterprises across the TCLF value chain, ensuring perspectives from all stages of production and distribution.
- **Educational institutions:** Representatives from vocational education and training (VET) centres, higher education (HE) providers, and curriculum designers.
- **Policy and sectoral associations:** Policymakers, trade associations, and sectoral experts who could provide strategic and policy-level insights.

To enhance the validity of the findings, stakeholders were selected from outside the project partner organisations, ensuring that the feedback was objective and representative of the wider TCLF sectors.

Focus groups were conducted **in-person where feasible**, but where stakeholders were geographically dispersed or unable to travel, **online sessions** were held using platforms such as Zoom and Microsoft Teams. The choice of format was determined by logistical convenience rather than urban or rural distinctions, ensuring maximum accessibility and engagement.

Each session included **6–10 participants**, ensuring a dynamic group interaction while allowing each participant the opportunity to contribute meaningfully. This group size follows established guidelines for focus group research, where smaller groups are recommended for complex or technical discussions.

2.2.4 Implementation and Logistics

The focus groups were conducted between **October 20 and November 6, 2024**, using a combination of in-person and online formats to maximise accessibility and convenience for participants. The choice of format was determined by logistical considerations, including geographical dispersion, participant availability, and travel constraints.

- **In-person and online formats:** Where stakeholders were located in close proximity to one another, focus groups were conducted in person to facilitate direct interaction and engagement. In contrast, online sessions were organised when participants were geographically dispersed or unable to travel. Zoom and Microsoft Teams were used as the digital platforms for online focus groups, selected for their user-friendly interfaces, secure data handling features, and reliable recording functionalities.
- **Duration and session structure:** Each focus group session lasted between **45 and 60 minutes**, depending on participant availability and the depth of discussion. This duration was strategically chosen to balance participant engagement with the need for in-depth exploration of complex issues such as skills gaps, technological integration, and diversity challenges within the TCLF sectors.
- **Moderation and facilitation:** The focus groups were moderated by **project partners** who were familiar with the AEQUALIS4TCLF project objectives and had access to the survey results. The moderators were primarily from the non-academia partners, including industry associations and trade organisations, with support from the academia partners where relevant. The choice of project partners as moderators was informed by their subject matter expertise and contextual knowledge of the TCLF sectors, which enabled them to effectively contextualise the discussions and probe deeper into emergent themes.

They used the semi-structured question framework as a guide, encouraging balanced participation and allowing for spontaneous dialogue on emergent issues.

- **Recording:** Most sessions were recorded using the recording functionalities of Zoom and Microsoft Teams. To ensure data integrity and confidentiality, all recordings were anonymised, and participants were informed about the data handling procedures.
- **Background materials:** Participants were provided with background materials, including summaries of the survey findings, to inform and contextualise the discussions. This pre-session information enabled participants to reflect on the key issues before the sessions, enhancing the depth and relevance of their contributions.

2.2.5 Challenges and Mitigation

Conducting the focus groups for the AEQUALIS4TCLF project involved some challenges, reflecting the complexities of organising qualitative research across seven European countries with diverse stakeholder groups.

One of the primary challenges was ensuring **balanced geographical representation** across the seven participating countries. While efforts were made to engage stakeholders from each country, the level of representation varied, with some countries having a higher number of participants than others. This variation was influenced by factors such as:

- **Stakeholder availability and willingness to participate**, which differed across countries due to contextual and organisational priorities.
- **Network reach of the project partners**, which varied depending on their existing connections within the TCLF sectors in each country.

To address this challenge, the focus groups were conducted predominantly online, using platforms such as Zoom and Microsoft Teams. The choice of online sessions was strategically made to maximise accessibility and enable participation from geographically dispersed stakeholders who might otherwise have been unable to attend in-person sessions. However, the reliance on online platforms affected the dynamics of group interaction, as virtual discussions tend to be less spontaneous and interactive compared to face-to-face settings. This was particularly noticeable when participants were less familiar with digital communication tools or when technical issues such as connectivity problems affected the flow of conversation.

To enhance participation and engagement in the online format, the moderators employed the following strategies:

- **Directly inviting participants to contribute**, ensuring balanced participation and preventing dominant voices from overshadowing quieter participants.
- **Using visual stimuli**, such as survey summaries and key questions shared on-screen, to guide the discussions and stimulate thought.
- **Encouraging informal dialogue**, including brief icebreakers and casual introductions, to create a comfortable virtual environment and foster a sense of community among participants.

Despite these strategies, the online format posed inherent limitations, including the reduced spontaneity of interactions and the challenges of managing non-verbal cues, which are typically easier to observe in face-to-face settings.

Coordinating the schedules of diverse stakeholders proved challenging, particularly given their varied organisational roles, responsibilities, and time commitments. The focus groups involved participants from multiple stakeholder groups, including industry leaders, educational providers, policymakers, and sectoral associations. Finding mutually convenient times that accommodated the availability of all participants was complex and required significant coordination efforts.

To address this issue, a flexible scheduling approach was adopted, which included:

- **Offering multiple session options** at different times and days to maximise participation opportunities.
- **Using scheduling tools**, such as Doodle polls, to efficiently gather participants' availability and identify the most convenient time slots.
- **Sending personalised invitations and reminders**, ensuring that stakeholders were well-informed about the session details and encouraged to participate.

The focus groups were designed to gather feedback on the survey findings, particularly concerning skills gaps, curriculum alignment, and challenges related to the green and digital transitions. Participants were encouraged to provide their perspectives on these issues, reflecting their organisational roles and strategic priorities.

The discussions revealed **differing needs and expectations** among the stakeholder groups, particularly between:

- **Industry representatives**, who focused on operational skills and workforce readiness.
- **Educational providers**, who prioritised curriculum development, pedagogical integration of emerging technologies, and alignment with educational standards.
- **Policymakers and sectoral associations**, who were concerned with long-term strategic frameworks, regulatory compliance, and workforce diversity initiatives.

These differing needs were not a challenge in terms of moderation but were instead a **valuable source of insight** into the complex and sometimes conflicting priorities within the TCLF sectors. The semi-structured question framework was strategically designed to **explore these differences**,

enabling a balanced dialogue where contrasting viewpoints were openly discussed and contextualised.

2.3 Analytical Approach

2.3.1 Survey Data Analysis

The **survey data analysis** phase involved a systematic process of **data cleaning, organisation, and interpretation** to identify patterns and trends in skills needs, training gaps, and diversity challenges within the Textile, Clothing, Leather, and Footwear sectors. The analysis was conducted using **Excel** for data cleaning and organisation, followed by a **Language Learning Model (LLM)** for comparative analysis and thematic interpretation. This approach was selected to efficiently manage the large dataset collected from **222 survey responses**, ensuring a **comprehensive and nuanced interpretation** of stakeholder perspectives.

2.3.2 Data Cleaning and Organisation Using Excel

The initial phase of the analysis involved cleaning and organising the survey data using Excel. This was necessary to ensure data integrity and consistency, given the multilingual nature of the survey and the variations in stakeholder responses across the seven participating countries. The following steps were undertaken:

- **Manual translation of open-ended responses:** Due to issues with the survey platform, open-ended responses were collected in multiple languages. The project partners manually translated these responses into English to maintain contextual accuracy and consistency in data interpretation.
- **Data cleaning and validation:** The survey data was meticulously cleaned to remove incomplete or inconsistent responses, ensuring high-quality input for analysis. This included verifying stakeholder classifications (e.g., companies, VET/HE institutions) and ensuring accurate representation across sectors and countries. Out of the total 222 responses, 164 were fully completed and valid for analysis, representing a completion rate of approximately 76.6%.
- **Data compilation and categorisation:** The cleaned data was compiled and categorised according to the different survey questions, enabling comparative analysis across countries

and stakeholder groups. This categorisation facilitated the identification of patterns and trends in skills gaps, curriculum alignment, and industry challenges.

2.3.3 Comparative and Thematic Analysis Using Language Learning Model (LLM)

Following data cleaning and organisation, a LLM was employed to analyse the survey data, leveraging its advanced natural language processing capabilities for both quantitative and qualitative analysis. The analysis was conducted in two main phases:

1. Comparative analysis:
 - The LLM was used to compare the responses across different countries and stakeholder groups, including cross-tabulations and frequency analysis. This comparative analysis enabled the identification of regional differences and stakeholder-specific priorities in skills needs, curriculum effectiveness, and workforce challenges.
 - For example, the demand for digital skills was compared across countries to identify regional variations in digital readiness and technological integration. Similarly, stakeholder groups (e.g., companies vs. educational institutions) were compared to explore differences in perceived skills gaps and curriculum alignment.
2. Thematic analysis of open-ended responses:
 - The open-ended survey responses were analysed using thematic coding facilitated by the LLM. This involved categorising the qualitative feedback into key themes, including skills gaps, technology integration, sustainability practices, and workforce diversity.
 - The LLM identified recurring themes, patterns, and stakeholder narratives, enabling a context-rich interpretation of the qualitative data. For instance, discussions on barriers to digital skills acquisition were coded into sub-themes, such as outdated curricula, lack of industry-education collaboration, and resource constraints.
 - This thematic analysis provided explanatory depth to the quantitative trends, contextualising the survey findings within the real-world experiences of stakeholders across the TCLF sectors.

The use of the LLM for comparative and thematic analysis enhanced the efficiency and depth of data interpretation, ensuring a strong foundation for the subsequent integration and triangulation of findings.

2.3.4 Focus group data analysis

The focus group data analysis phase aimed to validate and contextualise the survey findings by exploring stakeholder perspectives in greater depth. The focus groups provided qualitative insights into skills gaps, curriculum alignment, and challenges related to the green and digital transitions. The data for this phase was compiled as summaries by the project partners, who conducted the focus groups across the seven participating countries.

The data was compiled as detailed summaries by the project partners, capturing the key discussion points, stakeholder feedback, and contextual narratives from each session. These summaries included:

- **Feedback on survey findings:** Stakeholders provided feedback on the survey results, validating quantitative trends and offering contextual explanations for observed patterns.
- **Thematic discussions:** The focus groups explored key themes, including skills gaps, technology integration, curriculum effectiveness, sustainability practices, and workforce diversity. These discussions were guided by a semi-structured question framework, ensuring consistency across countries while allowing flexibility for emergent themes.

The focus group summaries were compiled into a single dataset, organised by country and stakeholder group, enabling a comparative analysis of the qualitative insights across different countries and sectors. This organisation facilitated the identification of regional trends and contextual differences, ensuring that the findings were context-sensitive and representative of the diverse stakeholder perspectives.

2.3.5 Thematic analysis using Language Learning Model (LLM)

The LLM was used to analyse the focus group summaries by identifying recurring themes, patterns, and stakeholder perspectives. The thematic analysis involved:

- Categorising the qualitative insights into key themes consistent with the survey findings, including skills gaps, technology integration, sustainability challenges, and workforce diversity.
- Cross-referencing with survey data to explore contextual explanations and narrative depth for the quantitative trends identified in the survey.

The focus group findings were then compared across countries and stakeholder groups to identify consistencies and discrepancies, enhancing the contextual relevance of the findings.

2.3.6 Integration of Findings

The integration of findings involved systematically combining the quantitative survey data with the qualitative insights from the focus groups, ensuring a holistic and nuanced interpretation of the data. This phase was designed to provide a comprehensive understanding of the skills needs, training gaps, and diversity challenges within the TCLF sectors. The integration approach followed a mixed-methods triangulation strategy, which served two main purposes: validating and enriching insights and synthesising findings into a cohesive narrative.

2.3.6.1 Triangulation of Data

Triangulation was employed to cross-reference the findings from the survey and focus groups, validating the quantitative trends with qualitative explanations and contextual insights.

- **Cross-referencing survey and focus group findings:** The quantitative trends identified in the survey were systematically compared with the qualitative narratives from the focus groups to validate and contextualise the findings. For example:
 - Survey data showing a high demand for digital skills was complemented by focus group discussions detailing specific barriers to integrating digital training in curricula, such as outdated educational programs, limited infrastructure, and lack of collaboration between industry and educational institutions.
 - Quantitative findings indicating regional differences in skills gaps were contrasted with focus group narratives explaining contextual factors influencing these differences, such as regulatory requirements, industry specialisations, and technological readiness in different countries.

- **Contextualisation of quantitative trends:** The qualitative insights provided contextual depth and explanatory power to the quantitative trends, enabling a more nuanced understanding of stakeholder perspectives. For instance:
 - Quantitative trends highlighting the demand for green skills were contextualised with qualitative feedback on the barriers to sustainability practices, including resource constraints, lack of specialised training, and cultural resistance to change within organisations.
 - Survey data showing skills mismatches in current curricula were enriched with focus group narratives discussing the disconnect between industry needs and educational offerings, including challenges in updating curricula to align with emerging technologies and industry standards.
- **Validation and verification:** The triangulation process validated the consistency and credibility of the findings by ensuring alignment across data sources. Discrepancies between the survey and focus group findings were systematically examined to explore underlying reasons, ensuring a balanced and objective interpretation.

2.3.6.2 Synthesis of Insights

The final phase of the integration process involved synthesising the insights into a cohesive narrative, ensuring that the findings were directly relevant to the objectives of Work Package 3 (WP3) within the AEQUALIS4TCLF project. The synthesis process followed a thematic narrative approach, where the integrated findings were organised into cohesive themes, including skills gaps, curriculum alignment, technology integration, and diversity challenges.

- **Building a cohesive narrative:** Commonalities across data sources were identified and synthesised to build a cohesive narrative, linking stakeholder needs, educational challenges, and industry requirements. For example:
 - Shared concerns about sustainability were consistently highlighted across both survey and focus group data, indicating a growing demand for green skills and sustainable practices within the TCLF sectors. This commonality informed strategic recommendations for integrating sustainability into curricula and workforce training programs.

- Technological integration and digital transformation emerged as a cross-cutting theme, with stakeholders emphasising the need for digital skills and the barriers to adopting advanced technologies. This narrative coherence guided the development of actionable recommendations for digital upskilling and curriculum modernisation.
- **Exploring divergences and identifying gaps:** Divergences between the survey and focus group findings were systematically explored to identify gaps or areas for targeted interventions. For example:
 - Differences in stakeholder priorities were observed between companies and educational institutions, particularly concerning curriculum alignment and skills training. While companies emphasised operational skills and workforce readiness, educational providers focused on curriculum development and pedagogical integration of emerging technologies. These divergent perspectives informed strategic recommendations for enhancing industry-education collaboration.
 - Regional discrepancies in skills needs and technological readiness were identified, reflecting contextual variations in regulatory requirements, industry specialisations, and cultural attitudes towards digitalisation. These regional differences informed context-sensitive policy implications and curriculum development strategies.

The synthesis of insights enabled the development of strategic recommendations that were directly informed by the integrated findings, ensuring that the conclusions were context-sensitive, actionable, and strategically relevant to the TCLF sectors. The synthesised insights provided a foundation for the subsequent sections, including curriculum development strategies, skills policy implications, and stakeholder collaboration frameworks.

2.3.7 Ethical Considerations in Analysis

Throughout the analysis process, ethical considerations were strictly observed to ensure confidentiality, integrity, and unbiased interpretation of the data. The ethical approach followed the guidelines outlined by the European Union General Data Protection Regulation (GDPR) and adhered to ethical research practices, including:

- **Anonymisation and confidentiality:** All data were anonymised to protect participant identities and ensure confidentiality. Personal identifiers were removed from the survey

responses and focus group summaries, ensuring that no individual respondent or organisation could be identified in the final report.

- **Aggregate reporting of findings:** The focus group findings were reported in aggregate, without attributing specific comments to individual participants, ensuring a neutral and respectful presentation of stakeholder perspectives while maintaining the authenticity and richness of the qualitative narratives.
- **Informed consent and voluntary participation:** All participants provided informed consent before participating in the survey and focus groups. They were fully informed about the purpose of the research, the data use, and their right to withdraw at any time without consequence.
- **Unbiased interpretation and researcher reflexivity:** To ensure unbiased interpretation, the data was analysed using a triangulation strategy, validating the findings across multiple data sources. Researcher reflexivity was practised to minimise subjective bias, where the research team-maintained awareness of their positionality and potential influences on the data interpretation process.

These ethical considerations ensured that the data integration and synthesis process was conducted with transparency, credibility, and respect for participant confidentiality, maintaining the integrity and ethical validity of the research.

3 SURVEY AND FOCUS GROUP ANALYSIS

The Survey and Focus Group Analysis section provides a comprehensive examination of the data collected from the AEQUALIS4TCLF project. The analysis focuses on the skills needs, training gaps, and diversity challenges within the Textile, Clothing, Leather, and Footwear (TCLF) sectors. The data is drawn from two primary sources:

- **An online survey conducted between July 10 and October 23, 2024**, targeting stakeholders from seven AEQUALIS countries (Croatia, Czechia, Finland, Lithuania, Netherlands, Serbia, and Slovenia).
- **Focus group discussions held from October 20 to November 6, 2024**, designed to validate and contextualise the survey findings through in-depth qualitative insights.

The integrated analysis of the survey and focus groups ensures contextual relevance and strategic alignment with the AEQUALIS4TCLF project's objectives.

3.1 Comparison of Participants by Country

This section provides a geographical breakdown of the online survey and focus group participants, ensuring that the findings are representative of the regional differences and commonalities within the European TCLF sectors.

3.1.1 Survey Participants by Country

The online survey was conducted between July 10 and October 23, 2024, across the seven AEQUALIS countries: Croatia, Czechia, Finland, Lithuania, Netherlands, Serbia, and Slovenia. **Out of the total 222 survey responses, 197 respondents were from the seven AEQUALIS countries, while 25 responses from other countries** (e.g., Italy, Germany, and Spain) were excluded to maintain a focused and contextually relevant scope. Of the 197 eligible responses, 164 were fully completed without errors and were therefore included in the analysis. This represents a completion rate of 83% for the eligible respondents.

The geographical distribution of the **164 fully completed survey responses** is as follows:

- Finland: 39 (23.8 %)
- Czechia: 30 (18.3 %)
- Croatia: 28 (17.1 %)
- Netherlands: 26 (15.9 %)

- Slovenia: 21 (12.8 %)
- Serbia: 12 (7.3 %)
- Lithuania: 8 (4.9 %)

The survey data shows a relatively balanced distribution across the seven countries, with Finland having the highest number of respondents (24%) and Lithuania the lowest (5%). This geographical diversity enhances the comparability and contextual relevance of the findings, ensuring that the data is representative of the regional differences and commonalities within the European TCLF sectors. This data can be found in the Annex section.

3.1.2 Focus Group Participants by Country

Following the completion of the online survey, focus group discussions were conducted from October 20 to November 6, 2024, in each of the seven participating countries. A total of 9 focus group discussions were held, with at least one group discussion organised in each country. The **total number of focus group participants** was **79**.

The breakdown of focus group participants by country is as follows:

- Slovenia: 20 participants (25.3 %)
- Croatia: 14 participants (17.7 %)
- Serbia: 14 participants (17.7 %)
- Finland: 9 participants (11.4 %)
- Czechia: 8 participants (10.1 %)
- Lithuania: 7 participants (8.9 %)
- Netherlands: 7 participants (8.9 %)

The focus group data shows a slightly different geographical distribution compared to the survey, with Slovenia having the highest number of participants (20), while Lithuania and Netherlands had the lowest (7 each). This difference in distribution is attributed to the logistical considerations and stakeholder availability in each country.

3.1.3 Comparative Analysis

When comparing survey and focus group participation by country, the following patterns and trends emerge:

- Finland reported the highest share of survey respondents (23.8 %), whereas Slovenia hosted the largest proportion of focus group participants (25.3 %).
- Lithuania accounted for the lowest share of survey responses (4.9 %) and, together with the Netherlands, the smallest focus group representation (8.9 %each).
- Croatia and Serbia recorded moderate to high participation in both the survey and the focus groups, suggesting a comparatively strong level of stakeholder engagement in these countries.
- Some variation reflects differences in industry structure, logistical constraints, and existing stakeholder networks. These factors highlight the importance of local contexts when interpreting the findings.

These trends offer valuable insights for subsequent sections, where regional dynamics are examined more closely in relation to skills gaps, curriculum alignment, and policy implications for workforce development in the AEQUALIS4TCLF project.

3.2 Comparison of Participants by Type of Institution

The Comparison of Participants by Type of Institution provides an analysis of the organisational affiliations of the respondents in both the online survey and focus group discussions. This section examines the distribution of participants across four key categories: Companies, Vocational Education and Training (VET) and Higher Education (HE) Centres, Sectoral Associations, and Local/Regional Authorities.

This classification captures the multi-stakeholder ecosystem of the TCLF sectors, where industry, education, and policy stakeholders collaboratively influence skills needs, technological integration, and workforce development. By comparing the entity types in both data sources, this section contextualises the findings within the strategic roles and priorities of each stakeholder group.

3.2.1 Survey Participants by Type of Institution

The online survey targeted stakeholders from four main categories (Companies, VET or Higher Education Centres, Sectoral Associations, and Local or Regional Authorities), plus an additional group marked as “Others.” This classification ensured broad coverage of industry perspectives, educational insights, policy positions, and overarching sectoral viewpoints.

Out of the 164 fully completed responses, the distribution is as follows:

- **Companies:** 89 respondents (approx. 54 %)
 - Reflects the largest stakeholder group, highlighting the central role of businesses in identifying operational skill gaps, specifying future skill needs, and pinpointing barriers to technology adoption.
- **VET or HE Centres:** 48 respondents (approx. 29 %)
 - Underscores the pivotal influence of educational institutions on the TCLF workforce, particularly concerning curriculum development, digital skills integration, and sustainability teaching.
- **Sectoral Associations:** 11 respondents (approx. 7 %)
 - Includes trade groups, industry associations, and professional bodies. Their contributions offer system-level insights into policy challenges, workforce development, and overarching industry trends.
- **Local or Regional Authorities:** 8 respondents (approx. 5 %)
 - Represents policy-focused bodies that shape educational funding, workforce planning, and public-private partnerships. Although smaller in number, they wield crucial influence over regional economic and training strategies.
- **Others:** 8 respondents (approx. 5 %)
 - Covers respondents who did not align with any of the above categories but still provided valuable information, especially regarding drivers of change in the sector.

The dominance of company participants reflects industry's key position in shaping workforce strategies, reinforcing the importance of aligning skills provision with real-world demands. Meanwhile, the presence of strong VET and HE representation highlights the significance of educational programmes in fostering the green and digital transitions that the TCLF sectors increasingly require.

3.2.2 Focus Group Participants by Type of Institution

The focus group discussions were designed to validate and contextualise the survey findings, providing qualitative insights into the skills needs, training gaps, and diversity challenges identified

in the quantitative analysis. The discussions involved 79 participants across the seven AEQUALIS countries, and the breakdown by type of institution is as follows:

- **Companies:** 37 participants (47%)
 - Companies represented the largest stakeholder group in the focus groups, reflecting their operational insights into skills needs, workforce challenges, and technological integration.
 - The qualitative feedback from company representatives provided detailed narratives on the barriers to skills acquisition, digital transformation, and sustainability practices.
- **VET/HE Centres:** 26 participants (33%)
 - VET and HE Centres accounted for the second largest stakeholder group, highlighting the strategic importance of educational institutions in curriculum development and skills training.
 - The focus group discussions provided in-depth insights into the challenges of aligning curricula with industry needs, including outdated educational programs, limited digital integration, and resource constraints.
- **Sectoral Associations:** 10 participants (13%)
 - Sectoral Associations included trade organisations and industry bodies that play a strategic role in policy advocacy and workforce development.
 - Their qualitative feedback provided systemic perspectives on regulatory challenges, industry trends, and strategic implications for national and regional skills strategies.
- **Local/Regional Authorities:** 6 participants (7%)
 - Local and Regional Authorities were the smallest stakeholder group in the focus groups, reflecting the policy-level perspectives on skills strategies, educational funding, and workforce planning.
 - Their strategic role is crucial for promoting public-private partnerships and supporting the green and digital transitions through regional economic development policies.
 - Compared to the survey, the focus groups showed a higher representation of Sectoral Associations and Local/Regional Authorities, providing policy-level and strategic insights that complemented the operational perspectives from companies and educational institutions.

3.2.3 Comparative Analysis

When comparing the **survey and focus group participants by type of institution**, the following patterns and trends are observed:

- Companies were the largest stakeholder group in both the survey (54%) and focus groups (47%), reflecting their strategic role in influencing skills needs, curriculum alignment, and workforce development.
- VET/HE Centres consistently represented the second largest group in both the survey (29%) and focus groups (33%), highlighting their critical role in shaping the future TCLF workforce and aligning educational programs with industry needs.
- Sectoral Associations and Local/Regional Authorities had a higher representation in the focus groups compared to the survey, reflecting the strategic decision to engage policy stakeholders and industry bodies for qualitative insights into regulatory challenges, industry trends, and skills strategies.
- The multi-stakeholder representation ensures a comprehensive understanding of the skills needs, workforce challenges, and industry dynamics within the TCLF sectors. This diversity enhances the validity and contextual relevance of the findings, ensuring strategic alignment with the AEQUALIS4TCLF project's objectives.

3.3 Comparison of Participants by Sector

The Comparison of Participants by Sector examines the distribution of respondents across the Textile, Clothing, Leather, and Footwear sectors in both the online survey and focus group discussions. This analysis provides a detailed overview of the sectoral landscape within the TCLF industries, highlighting cross-sectoral integration, strategic industry trends, and emerging skills needs.

This section contextualises the findings within the integrated nature of the TCLF value chain, where companies and educational institutions often operate across multiple sectors. By comparing the sectoral distribution in both data sources, the analysis ensures a comprehensive understanding of the skills needs and workforce challenges within each sector.

3.3.1 Survey Participants by Sector

The online survey invited respondents to indicate their involvement in one or more of four main sectors within the textile, clothing, leather, and footwear (TCLF) industries. This approach acknowledged the overlapping nature of many roles and organisations within the value chain. Out of 164 fully completed responses, the sectors were mentioned as follows:

- **Textile:** 93 mentions (approximately 57 %)
 - The textile sector received the highest number of mentions. This prominence reflects its foundational role in the TCLF value chain and underscores the need for advanced technical skills, digital competencies, and sustainable practices. Curriculum alignment and technological innovation are particularly vital in supporting areas such as automated production, circular economy principles, and Industry 4.0 initiatives.
- **Clothing:** 90 mentions (approximately 55 %)
 - Clothing, often intertwined with fashion, represented the second most common sector, illustrating its major influence on design, consumer demand, and workforce requirements in the TCLF industries. Many stakeholders identify with this category due to its visible market presence and fast-evolving consumer trends. Digital marketing, e-commerce, and sustainability strategies emerged as central concerns for clothing enterprises.
- **Leather:** 12 mentions (approximately 7 %)
 - Although fewer in number, leather participants reported significant regional importance, particularly in places with long-standing leather production traditions. Focus group discussions highlighted ongoing efforts to reconcile traditional craftsmanship with modern production standards, which requires upskilling in sustainable processing, digital design, and leadership skills.
- **Footwear:** 17 mentions (approximately 10 %)
 - Stakeholder involvement in the footwear sector reflects a combination of traditional craft practices and adoption of advanced manufacturing technologies. Survey respondents indicated that digital prototyping, sustainable materials, and leadership competencies are becoming increasingly necessary as consumer and regulatory pressures grow.

There were 212 total mentions, exceeding the number of respondents because many participants indicated involvement in multiple sectors. This overlap reflects the interlinked nature of the TCLF industries, where companies and educational providers often operate or collaborate across textile, clothing, leather, and footwear domains.

This cross-sector engagement highlights the importance of integrated skills strategies and cohesive training interventions that address shared challenges. It also supports the need for holistic approaches to curriculum design, industry collaboration, and policy-making to ensure green and digital transitions are effectively managed throughout the entire TCLF value chain.

3.3.2 Focus Group Participants by Sector

The focus group discussions were designed to validate and contextualise the survey findings, providing qualitative insights into the skills needs, training gaps, and diversity challenges identified in the quantitative analysis. A total of 79 participants were involved in the focus groups across the seven AEQUALIS countries. The sectoral distribution of focus group participants is as follows:

- **Textile:** 37 participants (47%)
 - The textile sector was the largest group in the focus groups, reflecting its strategic importance in driving technological integration, sustainability practices, and digital transformation within the TCLF industries.
 - The qualitative feedback from textile stakeholders emphasised the skills gaps in digital literacy, advanced technical skills, and leadership competencies, highlighting the need for upskilling and reskilling programs to support the green and digital transitions.
- **Clothing:** 28 participants (35%)
 - The clothing sector was the second largest group, reflecting its critical role in fashion innovation, consumer demand, and sustainability trends.
 - The focus group discussions provided in-depth insights into the skills gaps in digital marketing, e-commerce, sustainable practices, and leadership skills, reflecting the evolving consumer behaviours and regulatory requirements in the clothing industry.
- **Footwear:** 9 participants (11%)

- The footwear sector was smaller in the focus groups but remains strategically significant in regional economies with strong traditions of footwear craftsmanship, particularly in Croatia and Slovenia.
- The qualitative insights highlighted the skills gaps in digital design, sustainable manufacturing, and leadership skills, reflecting the challenges of integrating advanced technologies and sustainability practices in footwear production.
- **Leather:** 5 participants (6%)
 - The leather sector was the smallest group but remains strategically important in regional economies with historical legacies of leather craftsmanship, particularly in Serbia and Croatia.
 - The focus group discussions emphasised the skills gaps in sustainable leather processing, digital design, and leadership competencies, highlighting the challenges of aligning traditional craftsmanship with modern sustainability standards.

The focus group data shows a similar sectoral distribution to the survey, with the textile and clothing sectors being the most dominant. This reflects the strategic importance of textiles and clothing in driving employment, technological integration, and sustainable practices within the TCLF industries.

3.3.3 Comparative Analysis

When comparing the sectoral distribution of the survey and focus group participants, several patterns emerge:

- **Textile and Clothing**
 - In the survey, textile (approximately 57 %) and clothing (approximately 55 %) were the most frequently mentioned sectors. In the focus groups, textile (47 %) and clothing (35 %) again formed the largest groups. This prominence indicates their central position in the TCLF value chain and the considerable demand for relevant technical, digital, and sustainability-focused skills.
- **Footwear and Leather**
 - These sectors attracted smaller shares of respondents in both data sources, with footwear accounting for around 10 % in the survey and 11 % in the focus groups, and leather representing about 7 % of the survey sample and 6 % of the focus group

participants. Despite lower numbers, both footwear and leather remain strategically significant in regions where traditional craft expertise intersects with modern production requirements, creating niche but essential skill demands.

- **Cross-sectoral participation**
 - The survey data highlighted substantial cross-sectoral involvement, with many respondents selecting multiple sectors (especially textile and clothing) to reflect the integrated nature of their operations. In contrast, the focus group participants tended to discuss their experiences within a more defined sectoral framework, suggesting that broad collaboration occurs mostly at the organisational or enterprise level rather than at the individual level.

These findings indicate the importance of dual strategies for developing workforce skills. Cross-sectoral competences, particularly in areas such as digital technologies and sustainability, complement sector-specific training needs in advanced technical methods, leadership, and process innovation. Adopting a balanced approach ensures that the TCLF workforce is both specialised and adaptable, meeting the demands of ongoing green and digital transitions across Europe.

3.4 Analysis of Educational Institutions

This section examines the responses from **educational institutions** in the **online survey** and **focus group discussions**, focusing on the skills needs, curriculum alignment, new technologies, and communication with industry partners within the TCLF sectors. The analysis provides strategic insights into the **challenges and opportunities** faced by educational institutions in aligning their curricula with **industry requirements** and preparing graduates for the evolving demands of the TCLF workforce.

The analysis focuses on **several key questions (Annex section)** designed to capture perspectives on:

- Curricula skills
- Skill requirements
- New technologies
- Online and in-person training
- Communication with industry partners

The integrated analysis of survey data and focus group discussions ensures contextual relevance and strategic alignment with the AEQUALIS4TCLF project's objectives:

3.4.1 Crucial skills most lacking in current graduates

Survey respondents were asked which crucial skills they felt were most lacking in recent graduates. Although it was difficult for many participants to generalise, they most frequently cited deficits in **problem-solving and critical thinking (22%)**, and **specific technical competencies (18%)**. These gaps suggest that, while core theoretical knowledge may be adequate, it does not always translate into applied skills that align with industry demands. Figure 1 illustrates these survey findings, highlighting the prevalence of certain missing competencies across multiple respondents.

Focus group discussions echoed the survey results, pointing to broad concerns around soft skills and related competencies. Participants often emphasised the importance of:

- The ability to present and describe problems clearly
- Logical thinking and contextual awareness
- Teamwork and cross-cultural communication
- Self-directed learning and adaptability to changing work environments

In addition, some groups stressed the need for stronger language skills (particularly second or third languages), digital literacy, and familiarity with circular design concepts and new materials or production processes. These observations highlight the necessity for comprehensive training programmes that blend theoretical grounding with experiential learning, ensuring that graduates develop both the technical competencies and the critical soft skills necessary for success in the textile, clothing, leather, and footwear industries.

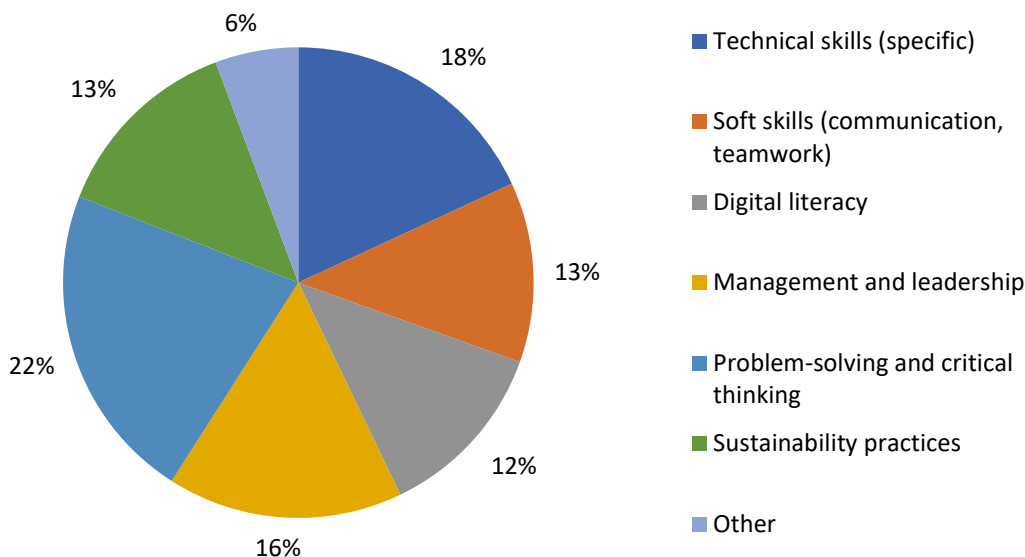


Figure 1 – Crucial skills most lacking in current graduates

3.4.2 Areas where current curricula fail to meet industry standards

Survey respondents were asked to identify the key shortfalls they perceive in current curricular content. The most frequently mentioned issues involved insufficient **modern technology and equipment**, inadequate **practical training**, and an incomplete **representation of the industry's scope and career potential**. These points (see Figure 2) underscore a gap between academic instruction and workplace realities, reflecting the need for more effective integration of up-to-date tools and practices.

Focus group participants confirmed these findings, outlining five primary recommendations to address the observed shortfalls:

- **Co-creation of curricula:** Collaborate with industry stakeholders to design and update curricular content, ensuring alignment with relevant sector needs.
- **Practical teaching and experience:** Increase workplace-based learning, encourage foreign internships, involve industry experts in teaching, and consider hiring younger instructors who are well-versed in emerging technologies.
- **Professional focus:** Emphasise topics such as digitalisation, automation, robotisation, and circular economy principles to prepare graduates for green and digital transitions.

- **Company engagement:** Support dual education opportunities, formulate thesis projects aligned with business challenges, and consider developing in-house training facilities supervised by industry professionals.
- **Job fairs and networking:** Promote greater interaction between educational institutions, students, and industry representatives, raising awareness of career paths and enhancing opportunities for collaborative problem-solving.

These proposals highlight the importance of bridging theory and practice. By prioritising current industry competencies and engaging professional experts, educational providers can better align courses with emerging workplace demands, thus equipping graduates for success in modern textile, clothing, leather, and footwear sectors.

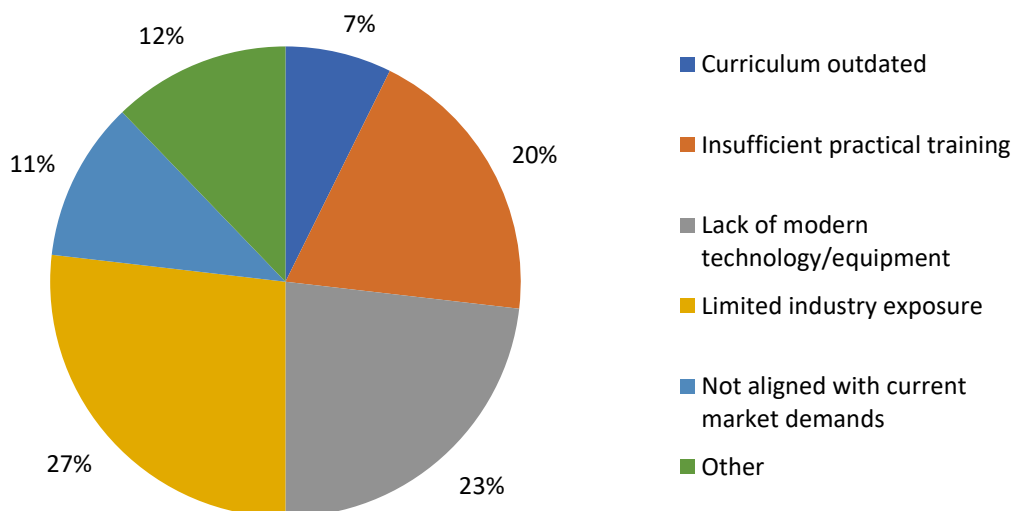


Figure 2 - Areas where current curricula fail to meet industry standards

3.4.3 Changes in skill requirements anticipated over the next 5–10 years

Survey respondents generally agreed that the most important educational requirements for the next five to ten years lie in **interdisciplinary knowledge**, with a strong secondary emphasis on **sustainability**. Figure 3 illustrates this focus, suggesting that students will need broad-based

competencies spanning technical, environmental, and managerial disciplines to meet evolving industry expectations.

Focus group participants echoed these points, highlighting medium-term adjustments driven by new legislation and rising bureaucratic demands that many companies believe will strain their time and resources. They expect a generational shift in the economy, potentially creating a shortage of experienced professionals, while prompting increased reliance on foreign workers. Several groups anticipated the regionalisation of production chains, including a partial return of manufacturing to Europe, which could spur the reopening of laboratories and other support facilities that had previously closed.

The presence of more global players may also limit the viability of companies operating solely within their home markets, prompting both deeper specialisation and the search for new business models. Participants further noted the expansion of automation, digitalisation, and robotisation in production processes, as well as the rising importance of sustainability and circular economy principles. They believe that eco-friendly and innovative materials, combined with robust recycling solutions, will become decisive competitive advantages, particularly as public procurement and consumer demand continue to prioritise sustainable offerings.

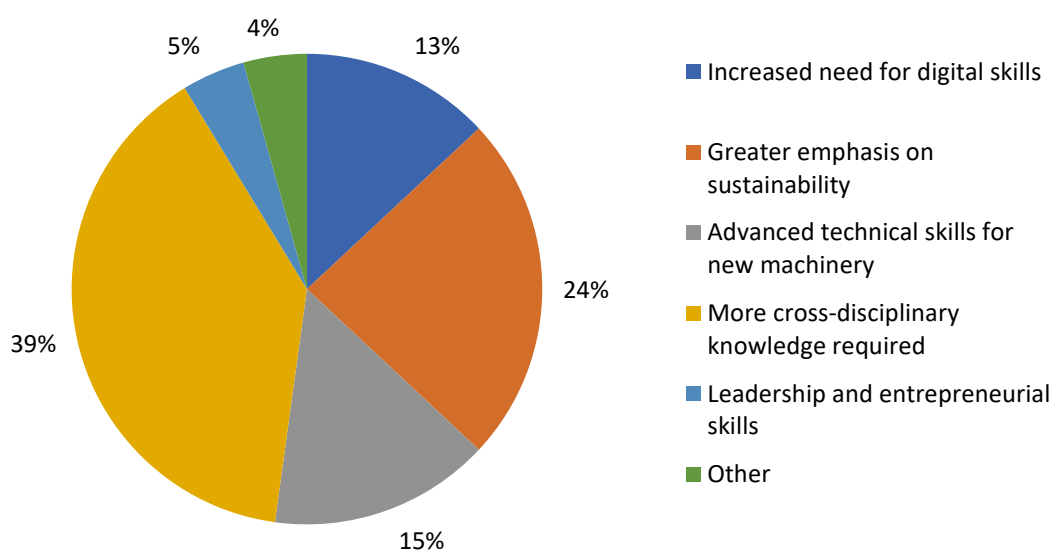


Figure 3 - Changes in skill requirements anticipated over the next 5–10 years

3.4.4 How institutions are preparing to integrate future skills into existing curricula

Survey respondents reported that their educational institutions plan to address future skill requirements by **creating new courses or adapting existing ones**, often in direct partnership with industry experts. Figure 4 illustrates this trend, with the majority of respondents indicating an openness to expanding collaboration beyond traditional academic frameworks.

Participants in the group discussions reinforced the survey findings, suggesting that educational programmes should emphasise **effective information retrieval** and the ability to **apply knowledge in practical contexts** rather than primarily memorising facts. Many agreed that schools should impart core professional skills, which can then be refined through deeper engagements with companies. Basic concepts of **circular economy** should be integrated across curricula, and entirely new study programmes centred on **sustainability** could be introduced. There was a shared belief that **digital technologies** demand significantly more attention at all levels of education.

The focus groups also highlighted the importance of strengthening ties between schools and companies through co-created curricula, teacher and student visits to companies, industry-led modules, and internationally focused student exchanges. Such initiatives were seen as vital for equipping future professionals with the skills required in a rapidly evolving marketplace. In addition, participants noted the potential of **lifelong learning** and **modular education** to provide ongoing skill development in areas such as advanced digitalisation, leadership, and sustainable business practices.

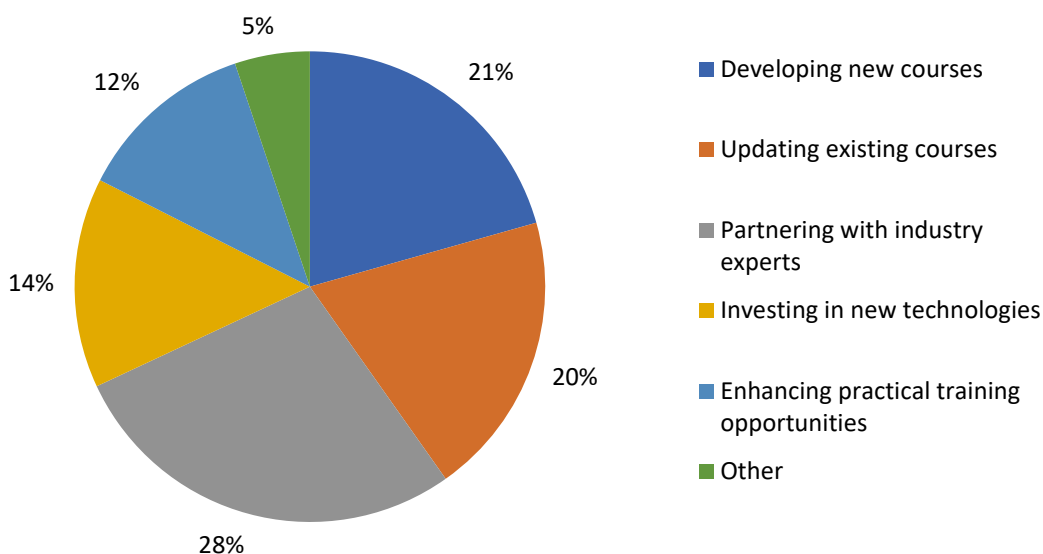


Figure 4 - How institutions are preparing to integrate future skills into existing curricula

3.4.5 Extent of new technology integration in curricula

New Survey respondents indicated that **new technologies are only partially integrated** into most curricula or appear in isolated courses. Figure 5 captures this reality, suggesting that while certain programmes include modern digital components, comprehensive **adoption across entire institutions remains limited**.

Participants in the group discussions confirmed these observations, although the topic arose only briefly. Several stakeholders highlighted the importance of **increasing investment in digitalisation education**, including collaboration with local authorities to secure resources that would enable broader curricular updates. While some schools reported expanding their technological offerings, most acknowledged that genuine institution-wide integration of digital tools and methods would require sustained funding, strategic planning, and ongoing partnerships with industry and government.

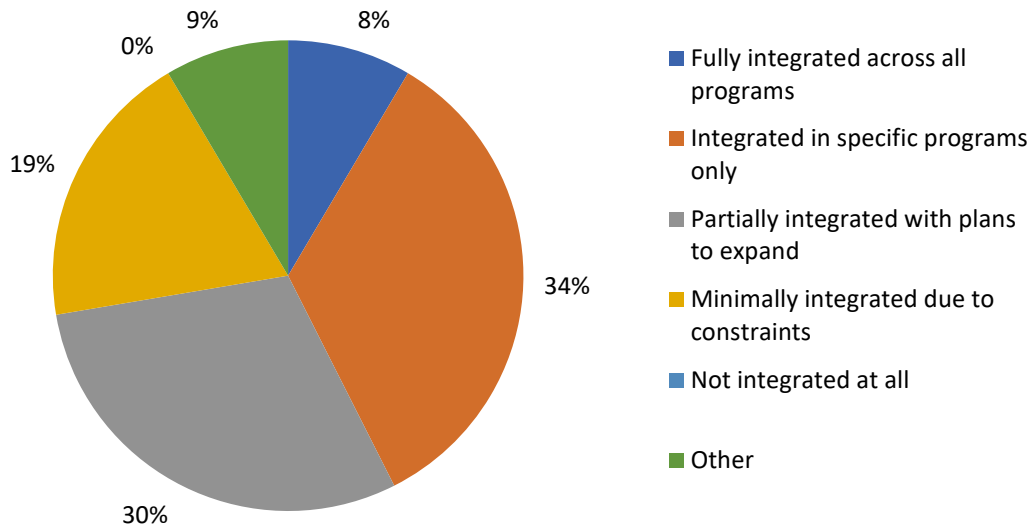


Figure 5 - Extent of new technology integration in curricula

3.4.6 Types of new technologies adopted in educational programmes

Survey respondents indicated that the most commonly adopted technologies in their institutions include:

- **Digital design and manufacturing software** (34%), particularly related to fashion and pattern-making
- **Online learning platforms** (27%), reflecting a growing trend towards remote and blended learning
- **Advanced machinery and equipment** (21%), typically involving specialised workshop or laboratory tools

These findings suggest that digital tools, such as design software, have been more readily integrated into curricula than higher-cost hardware or large-scale manufacturing equipment.

Participants elaborated that new technologies generally involve enhanced teaching equipment, such as digital whiteboards, computer labs, and machine or laboratory upgrades. Most institutions reported the incorporation of **CAD drawing programmes** as a noteworthy step in modernising practical training. However, there was little mention of more advanced or emerging technologies, indicating that broader adoption of automation, robotics, or data-driven systems remains limited.

Overall, the discussions emphasised the importance of additional resources and collaboration with industry partners to facilitate more thorough integration of innovative tools in education.

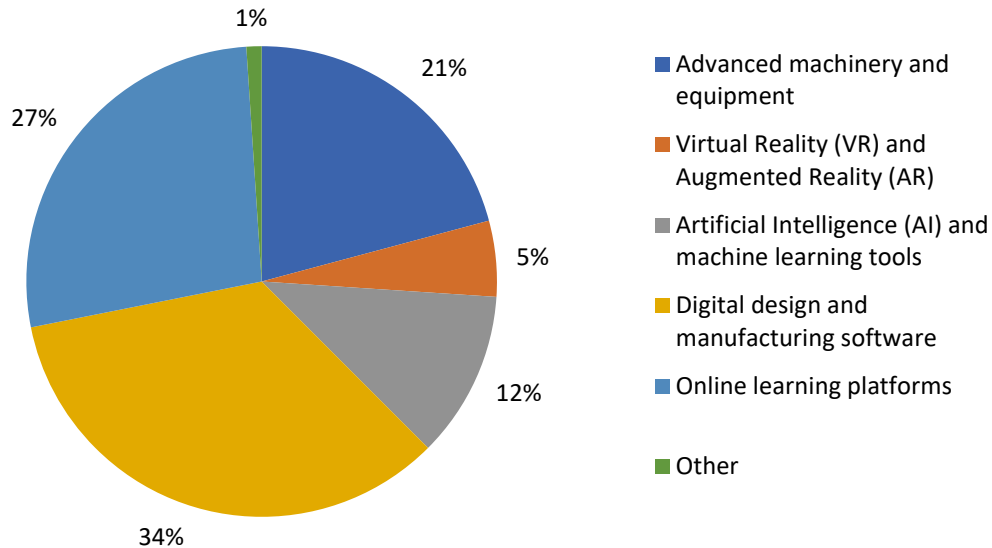


Figure 6 - Types of new technologies adopted in educational programmes

3.4.7 Main barriers to adopting new technologies in curricula

Survey respondents largely agreed that **insufficient financial resources** constitute the greatest obstacle to implementing new technologies in educational programmes. This challenge encompasses both the high cost of equipment and the limited availability of funding. A shortage of appropriately skilled experts to manage and teach with emerging devices ranked third, indicating that investment in human capital is as crucial as funding for hardware or software.

Group discussions echoed the survey findings, identifying three main barriers to technology adoption:

- **Financing:** Scarce funds or insufficient budget allocations make it difficult to acquire up-to-date equipment or digital tools
- **Age structure of educators:** Generational gaps sometimes reduce openness to new methods or tools, and can limit capacity to integrate modern technology
- **Rapid technological development:** The pace of innovation often outstrips institutional ability to adapt, requiring frequent curriculum revisions and ongoing training

These factors highlight the importance of stable, long-term funding streams, professional development for educators, and sustained collaboration between schools, companies, and policymakers to ensure curricula keep pace with technological advances.

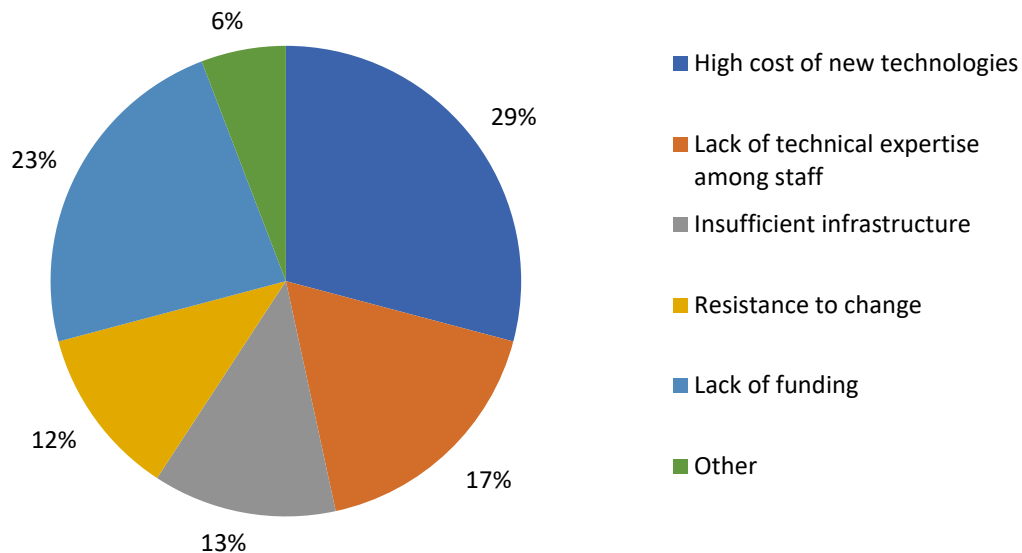


Figure 7 - Main barriers to adopting new technologies in curricula

3.4.8 Current mix of online and in-person training

According to educational institutions responding to the survey, no programmes rely exclusively on online teaching. Most offer traditional, in-person classes that may include digital elements such as online resources or supplementary activities. Around one fifth of respondents indicated that their institutions employ a balanced blend of classroom-based and online learning, reflecting a growing trend towards more flexible delivery methods.

Focus group discussions did not yield any divergent perspectives on the topic. Participants generally agreed that while fully online teaching is uncommon, institutions are increasingly experimenting with digital tools to enhance or complement face-to-face instruction.

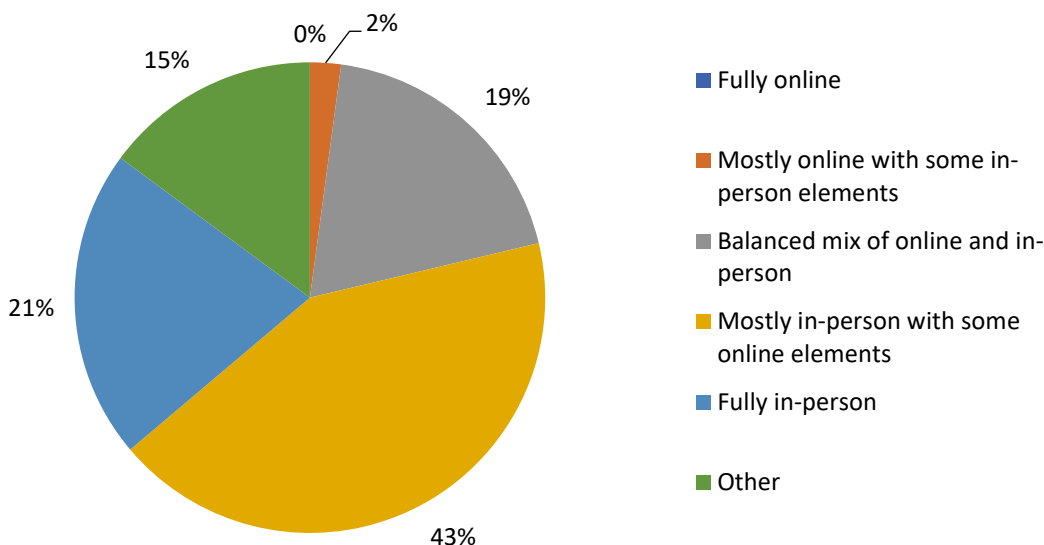


Figure 8 - Current mix of online and in-person training

3.4.9 Effectiveness of current curricula in preparing students for TCLF careers

When asked to evaluate how effectively current programmes address relevant industry technologies and innovations, educational institutions offered a generally positive assessment. The average rating was approximately 4.8 on a scale from 1 (inefficient) to 5 (completely effective), although “somewhat effective” emerged as the most frequent response. These findings suggest that, **while instructors see room for improvement**, they believe **core technological fundamentals are being conveyed adequately**.

Participants in group discussions reaffirmed that basic technological concepts are usually covered in today’s curricula. However, several areas were identified as needing further development:

- **Strengthening soft skills** such as logical thinking, problem-solving, teamwork, and communication
- **Increasing the practical element** through expanded company placements
- Providing additional **focus on digitalisation**
- Offering more opportunities for learning multiple foreign languages

These shortcomings reflect the broadening skill demands within modern textile, clothing, leather, and footwear industries, underscoring the need for a balanced approach that blends technical competence with advanced soft skills and market-aware adaptability.

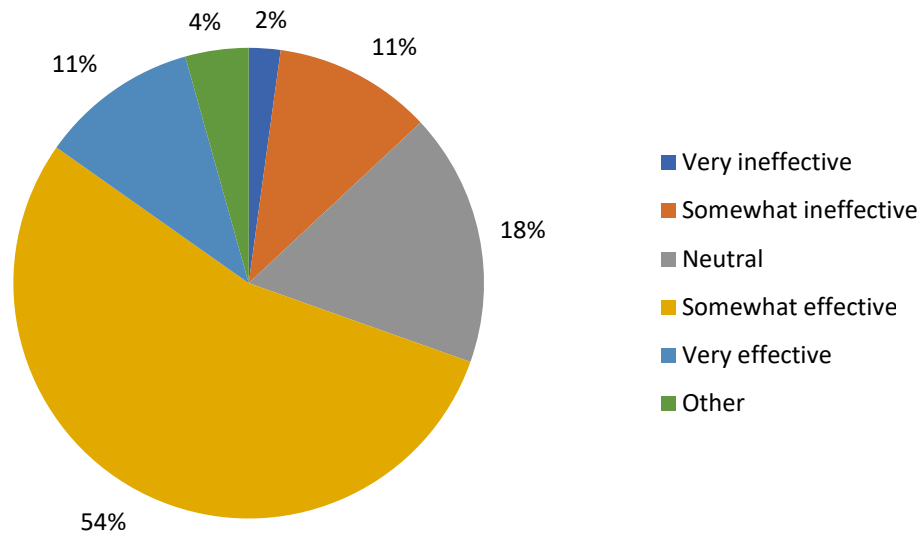


Figure 9 - Effectiveness of current curricula in preparing students for TCLF careers

3.4.10 Curriculum integration of current technologies and innovations

Respondents were asked how effectively they believe their curricula incorporate new technologies and sector innovations.

- 47 percent reported “moderately effective”
- 27 percent indicated “slightly effective”
- 22 percent selected “very effective”

These figures suggest that, while certain institutions have taken concrete steps to include emerging digital and technical content, many stakeholders remain only partly satisfied with the level of integration.

Participants reinforced these perspectives, noting that although basic technical concepts are taught, several recurring themes limit the overall impact of such integrations:

- **Alignment with industry tools:** While some schools have introduced modern machinery and software, many face resource limitations that hinder full adoption.

- **Collaborative curriculum design:** Stakeholders from multiple countries emphasised that closer, ongoing collaboration with industry is crucial for course content to stay abreast of evolving technologies.
- **Variation in institutional capacity:** Technical universities reported more extensive incorporation of advanced tools than secondary vocational schools. The latter often cited funding difficulties, scheduling constraints, or teacher upskilling needs as barriers to deeper technological integration.
- **Teacher training:** Many participants stressed the importance of continuous professional development for instructors, enabling them to provide instruction on emerging technologies in practice rather than theory alone.

These observations confirm that progress is being made but also highlight the need for deeper, faster, and more collaborative approaches to integrating emerging technological competencies into TCLF curricula.

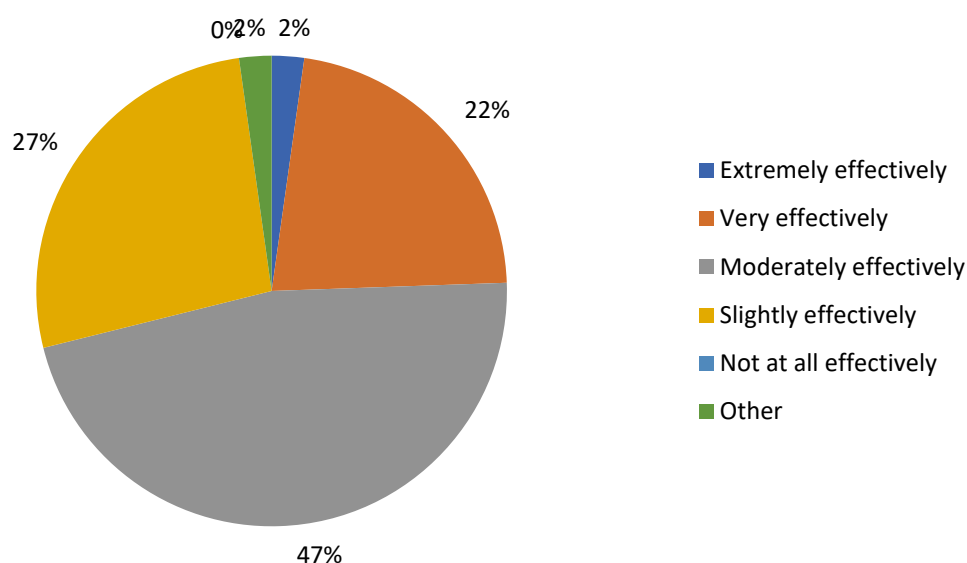


Figure 10 - Curriculum integration of current technologies and innovations

3.4.11 Collection of industry feedback on training programmes

When asked whether they gather feedback from industry partners, 59% of respondents said they do, while 41% indicated they do not.

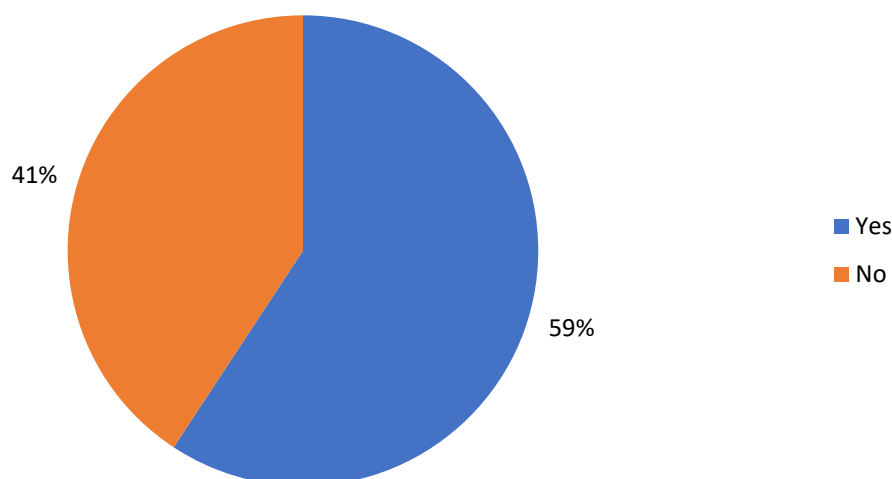


Figure 11 - Collection of industry feedback on training programmes

Those who do collect industry feedback typically do so through one or more channels illustrated in Figure 12:

- **Student internships** (59%)
- **Joint projects with companies** (12%)
- **Regular meetings with industry** (11%)
- **Other methods** (12%), such as informal communication or periodic surveys

Focus group participants confirmed that although many educational institutions have at least some connections with local businesses (most often through internships or occasional collaborative projects) such partnerships are not always systematic. Some institutions hold round tables, invite company representatives for presentations, or engage in more structured dialogue on curriculum development. However, these practices vary widely depending on factors such as resource availability, regional industry size, and institutional priorities.

Overall, the data suggest that while most educational stakeholders recognise the value of industry feedback, there is scope to expand and formalise these channels to ensure ongoing alignment between training programmes and evolving needs in the TCLF sectors.

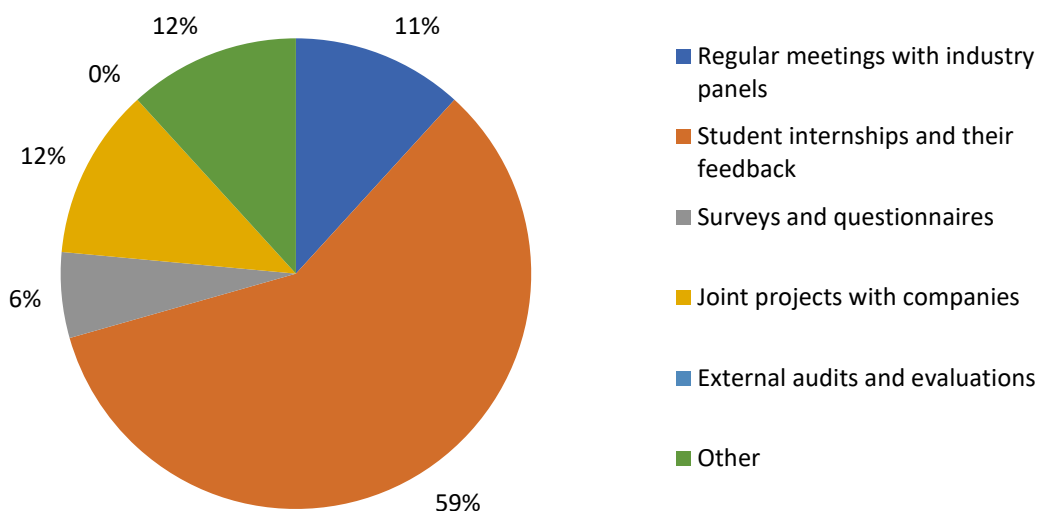


Figure 12 - Methods used by institutions to gather industry feedback

3.4.12 Main barriers to implementing feedback from industry partners

Survey responses indicate that **financial constraints** (cited by 43% of participants) pose the most significant barrier to implementing industry feedback, particularly regarding the purchase of equipment, expansion of training, and professional development for staff. **Inadequate engagement from businesses** (27%) and **regulatory restrictions** (23%) followed, underscoring challenges in fostering long-term collaboration and navigating rigid curricular frameworks. Smaller proportions of respondents (10% each) highlighted **internal resistance to change** and **limited faculty expertise**, while **scheduling issues** accounted for 7%.

Discussions in the focus groups largely echoed these findings. Several teachers voiced particular frustration over budget shortfalls and rigid administrative procedures that stall curriculum changes. Others described their efforts to engage local companies in designing course content, only to encounter inconsistent interest. Collectively, these perspectives point to a multifaceted challenge that requires more stable funding, stronger lines of communication, and flexible curriculum standards to ensure that industry feedback translates into tangible improvements in the classroom.

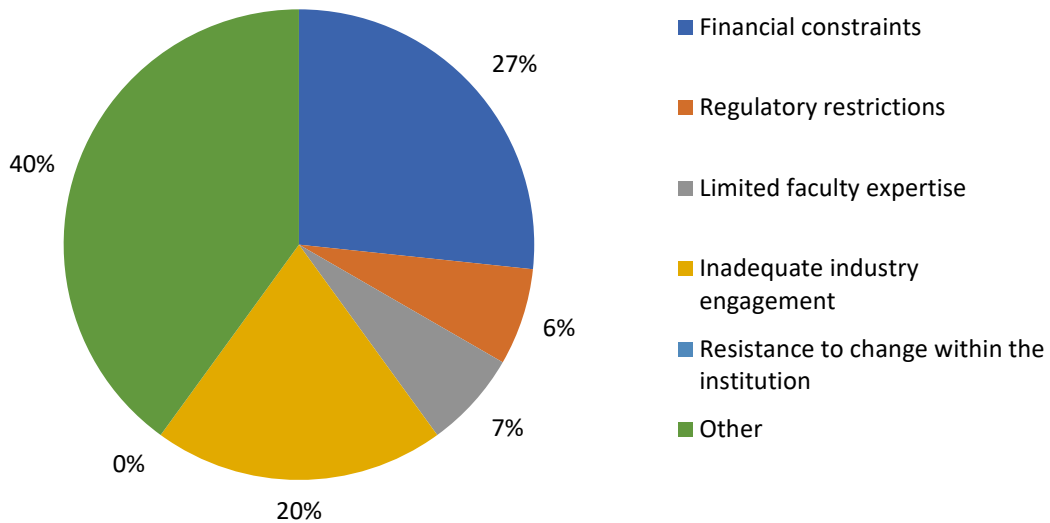


Figure 13 - Main barriers to applying industry feedback in curricula

3.5 Analysis of Companies

This section examines the responses from companies in the online survey and focus group discussions, focusing on skills needs, gender issues, foreign worker employment, and ethnic diversity within the TCLF sectors. The analysis provides strategic insights into the operational challenges and strategic priorities of companies, highlighting the skills gaps, workforce diversity issues, and strategic implications for curriculum development and skills strategies.

The analysis focuses on **different questions (Annex section)** designed to capture industry and academia perspectives on:

- Identification of companies
- Skills evaluation and requirements
- Gender issues
- Foreign worker and ethnic diversity issues

3.5.1 Companies size

Survey respondents indicate that **47%** of the surveyed firms qualify as small (1–50 employees), **36%** are medium-sized, and **16%** are large. These proportions demonstrate that small and medium-sized enterprises (SMEs) constitute the majority of the TCLF sector in the participating countries, reflecting a broader industry reality where resource constraints, workforce flexibility, and agile adaptation often shape operational strategies.

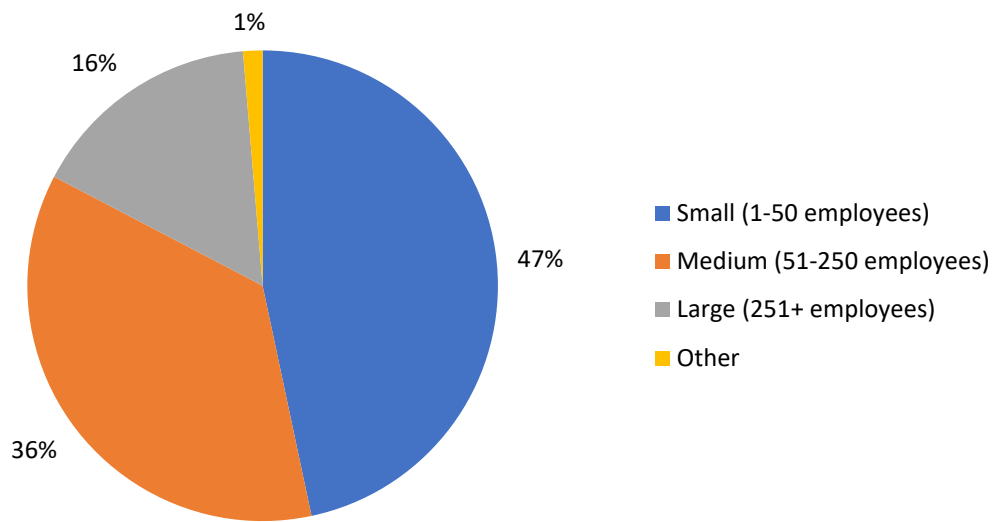


Figure 14 - Companies size

3.5.2 Distribution of company operations across the TCLF supply chain

Finishing or assembly has the largest share of mentions (35%), indicating that a significant number of enterprises focus on final production processes for garments, footwear, or accessories. **Material production** (29%) also features prominently, affirming that many companies engage in upstream stages of creating textiles or other key inputs. Wholesale, retail, and distribution (20%) reflect the essential role of sales and logistics in bringing products to consumers. Although fewer responses highlight raw materials processing (5%) and recycling or waste management (4%), they remain strategically relevant, particularly in sustainability initiatives. A modest proportion of mentions (6%) pertains to design, research, or specialised services, underscoring the breadth of business models within the TCLF value chain.

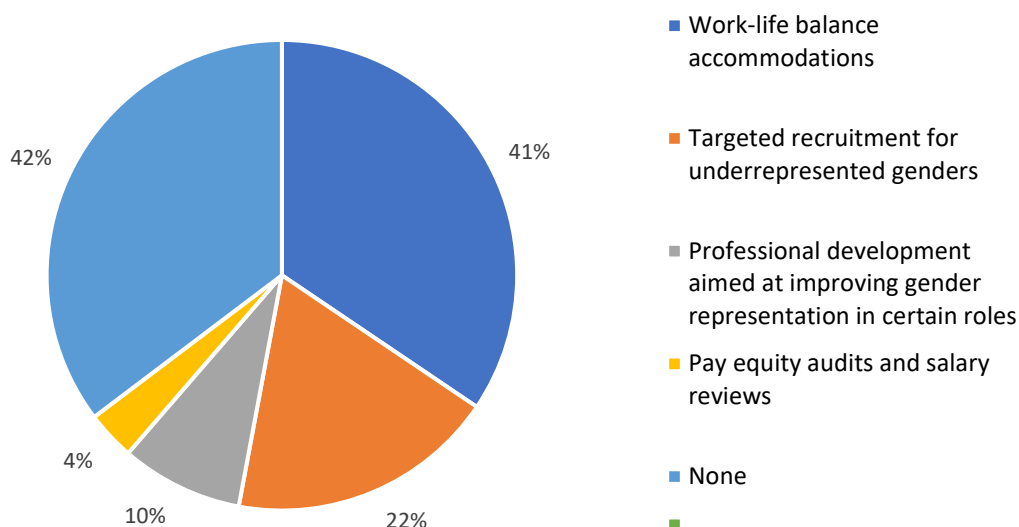


Figure 15 - Distribution of company operations across the TCLF supply chain

3.5.3 Essential skill sets for current operations

The results show that **technical skills** specific to the TCLF sectors are considered the most essential for current operations, cited in nearly 40% of all mentions. However, they are closely supported by **soft skills, problem-solving, and adaptability**, suggesting that companies value a combination of domain-specific competence and flexible, collaborative thinking. While slightly less frequent, **digital literacy** and **sustainability-related skills** still form a substantial share of responses, reflecting ongoing transitions in manufacturing and supply chain practices. The findings indicate that operational resilience increasingly depends on integrating technical proficiency with behavioural and innovation-driven capabilities.

Focus group input reinforced the survey's main conclusions, while offering more detail on the day-to-day implications of current skill gaps. Employers frequently pointed to difficulties finding workers who combine technical competence with strong communication, initiative, and the capacity to adapt to unpredictable workflows. Soft skills were described not as complementary, but as essential to maintaining efficiency and coordination in production environments. While technical knowledge was generally seen as a minimum requirement, several participants noted that even this is often outdated or too narrowly focused. Digital proficiency was mentioned across groups as lacking depth,

particularly in applied contexts, and sustainability skills were seen as increasingly relevant, though still underrepresented in most training programmes. These discussions make clear that industry needs are evolving faster than many educational systems can adapt, and that closer alignment is needed between curricula and the realities of modern TCLF operations.

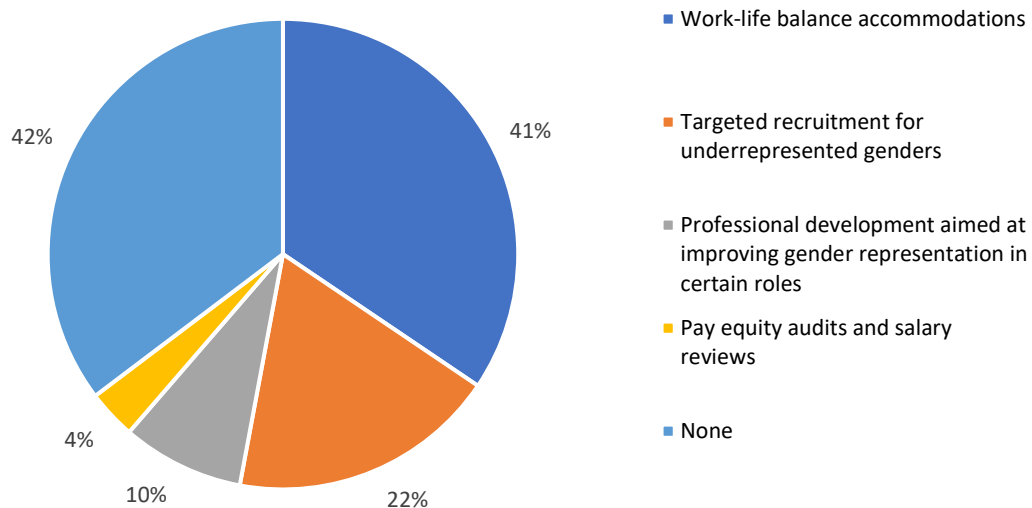


Figure 16 - Essential skill sets for current operations

3.5.4 Anticipated skills needs over the next 5–10 years

The most frequently cited future skill is **environmental and sustainability awareness**, reflecting growing regulatory demands, increased public scrutiny, and the industry's shift toward circular and resource-efficient practices. **Advanced machine operation** ranks second, signalling a continued reliance on increasingly complex, automated production systems. **Problem-solving** and **software proficiency** also stand out as priorities, underlining the importance of analytical thinking and digital capabilities in handling evolving workflows and production tools. **Leadership and management** was also identified as key to navigating organisational change, particularly within SMEs undergoing transformation.

Comments from focus group participants aligned closely with the survey results. Stakeholders across several countries identified **sustainability** as a central concern, both in terms of compliance with European legislation and as a strategic differentiator in competitive markets. The need for **digital and technical upskilling** was also repeatedly mentioned, especially in relation to automation, data management, and smart textile production. In some discussions, **leadership capacity** was framed as

a critical gap, particularly in smaller firms where team leaders are often promoted without adequate training.

Participants also noted that the pace of technological change will demand not only new technical skills, but also the **ability to adapt quickly**, manage information, and take responsibility in collaborative settings. In short, the focus groups confirmed that future workforce readiness will rely on a combination of **technical, digital, managerial, and sustainability-oriented competencies**, all of which need to be integrated more systematically into training and education systems.

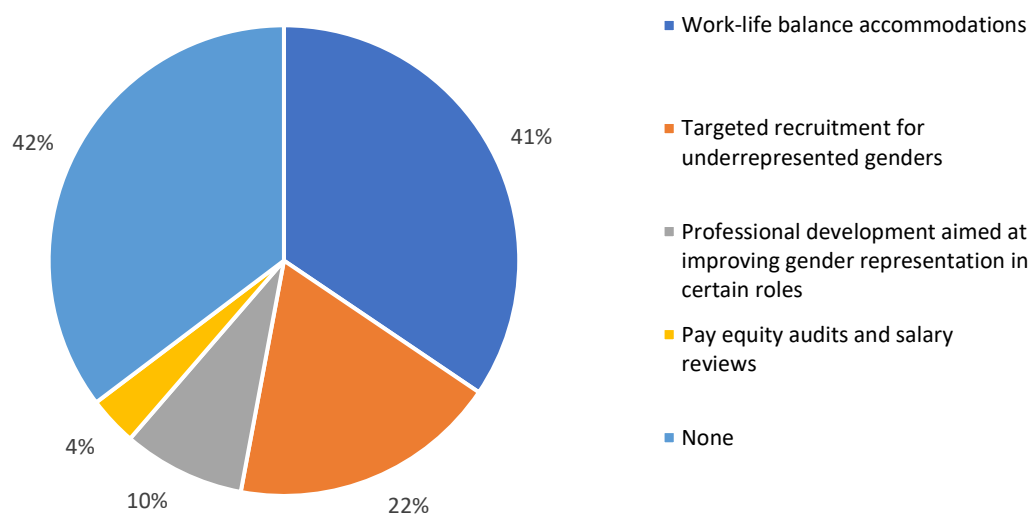


Figure 17 - Anticipated skills needs over the next 5–10 years

3.5.5 How do you assess the adequacy and effectiveness of training programs provided by HE/VET providers?

Companies expressed moderately critical views regarding the adequacy and effectiveness of training programmes offered by higher education (HE) and vocational education and training (VET) providers. The **average score was 3.4** on a scale from 1 (very adequate) to 5 (not applicable), with the **most common response being “adequately meets some needs but not others.”** This suggests that while training programmes may cover general knowledge, they often fall short in equipping learners with the specific skills needed for immediate employment in the TCLF sectors.

Feedback from focus group discussions reflected a similarly mixed assessment. Several participants

noted that expectations vary depending on the company's structure and positioning: **firms with narrow specialisations seek highly targeted technical skills**, while **broader-based companies prioritise transversal abilities such as communication and adaptability**. A recurring critique was the **limited exposure to real workplace settings**, with participants calling for more in-company training and practical learning. Additionally, the **lack of foreign language proficiency**, particularly in contexts where international cooperation is vital, was seen as a persistent weakness in current training models. These insights point to the need for more flexible, context-responsive curricula that reflect both the sector's diversity and its international character.

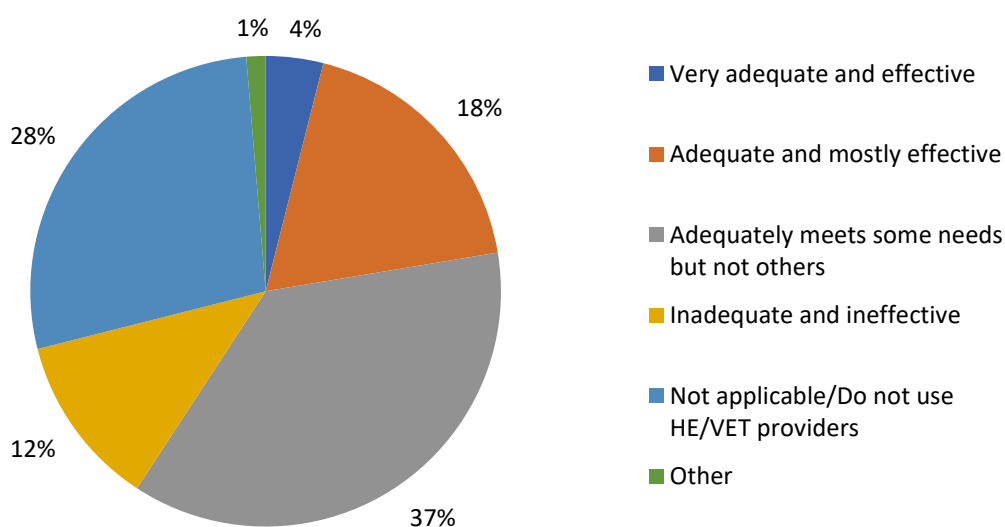


Figure 18 - Company views on the adequacy of HE/VET training provision

3.5.6 Communication channels between companies and education providers

Companies most commonly communicate their training needs and feedback through **direct contact with education providers**, reported by **51%** of respondents. A smaller share (**12%**) indicated that they rely on **sectoral associations** or intermediary organisations to convey their needs. Notably, **26%** of companies reported **no communication at all**, suggesting a disconnect between parts of the industry and the education system. These results reflect a generally informal and decentralised approach to industry-education collaboration.

The focus group discussions were consistent with the survey findings. Participants identified two

main modes of engagement: **direct collaboration with local VET or HE institutions** and, in some cases, **structured communication via regional or sectoral platforms**. However, several stakeholders noted that these exchanges are often sporadic and depend heavily on personal networks or project-based cooperation. The absence of systematic dialogue in many regions reinforces the need for more formalised and sustained mechanisms for aligning education with evolving company needs.

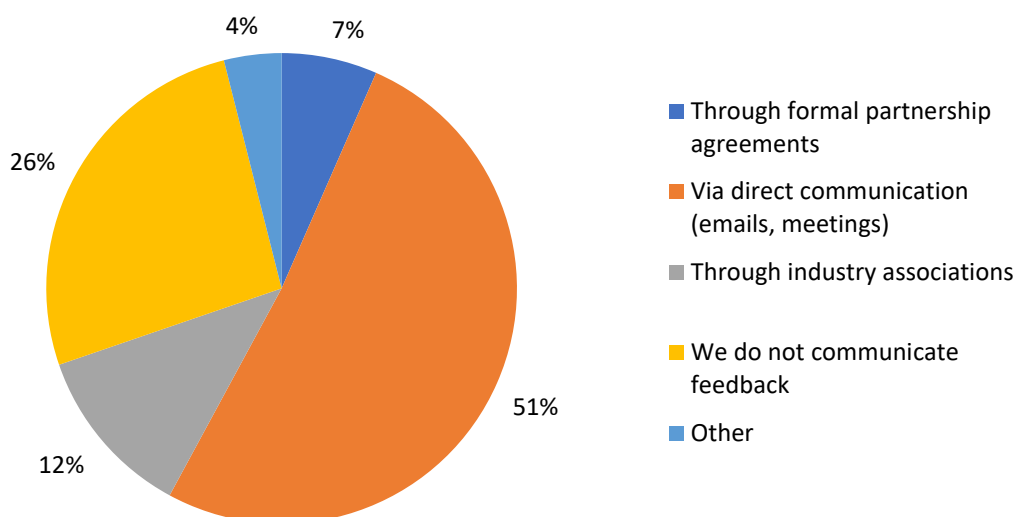


Figure 19 - Communication channels between companies and education providers

3.5.7 Company initiatives to promote gender balance

The **predominance of companies reporting no active gender balance initiatives** highlights a persistent gap in diversity strategies within the sector. While many firms offer work-life accommodations, more proactive measures (such as equitable recruitment, career development, and pay transparency) are less widely adopted. The findings point to the need for clearer guidance, capacity building, and potentially stronger policy incentives to promote gender equity more systematically across the TCLF industries.

Focus group discussions confirmed that while gender balance is a recognised issue in parts of the TCLF sectors, **structured company initiatives remain rare**. In countries like Czechia, participants acknowledged wage gaps and difficulties promoting women to leadership roles, especially where travel or family responsibilities are involved. While women are well represented in production roles,

their presence in management remains limited. Similarly, in the Netherlands, the conversation focused on the need to **recognise and address inclusivity gaps**, particularly in recruitment and internships, though companies were often hesitant to lead these efforts directly.

In other cases, such as Croatia and Lithuania, gender balance was discussed more indirectly (through concerns about low wages, poor working conditions, and limited career development, which disproportionately affect women and underrepresented groups). While some flexible work arrangements exist, they are not widely framed as gender equity strategies. Overall, the focus groups align with the survey findings: **formal, proactive gender balance initiatives are uncommon**, and where inclusion is addressed, it tends to be part of broader discussions on labour conditions and workforce retention.

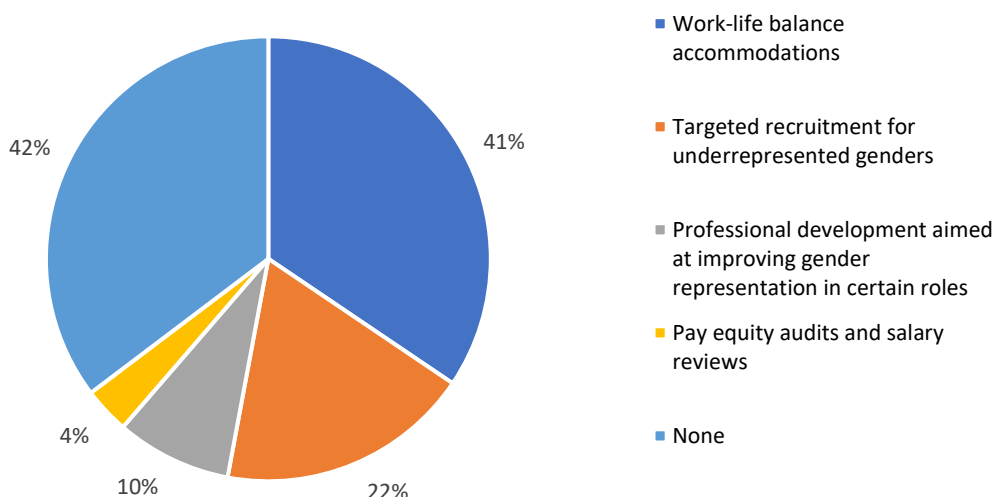


Figure 20 - Company initiatives to promote gender balance

3.5.8 Gender representation in the TCLF workforce

Survey responses show that most companies in the TCLF sectors report either a **predominantly female workforce (58%)** or a female-majority workforce with significant male representation (9%). **Only 22% of companies indicated a balanced gender composition**, while just 4% reported a predominantly male workforce. This gender distribution reflects the traditionally feminised nature of many TCLF occupations, especially in textiles, clothing, and footwear production.

Insights from the focus group discussions provide further context. In Czechia, several companies noted that **women are overrepresented in blue-collar positions but often face wage disparities and structural challenges in reaching management roles**. For instance, difficulties in combining professional mobility with care responsibilities were mentioned as a significant barrier for women in leadership. Similarly, vocational schools and art institutions observed a gendered divide in specialisations, with **women dominating in clothing and general subjects, while men were more represented in technical fields**. This reinforces the need for gender-sensitive approaches to both training and career progression across the sector.

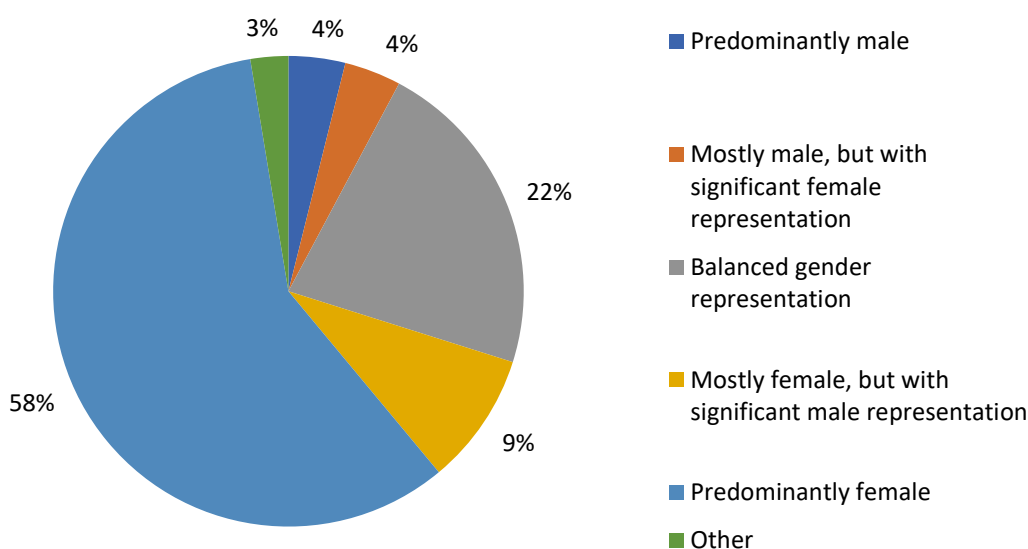


Figure 21 - Gender representation in the TCLF workforce

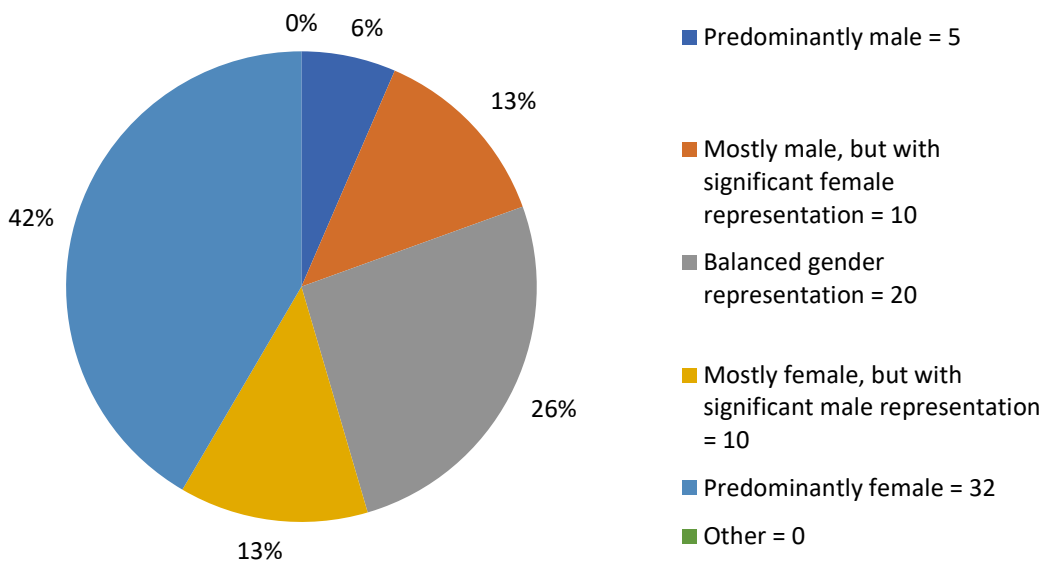


Figure 22 - Gender representation in leadership roles

3.5.9 Employment of foreign workers

According to company responses, **68%** of TCLF firms do **not employ any foreign workers**. Among those that do, **22%** reported employing workers from within the EU, while only **9%** indicated hiring individuals from non-EU countries. These results suggest that, despite increasing labour shortages in parts of the sector, cross-border recruitment remains limited, with most companies relying on domestic labour markets.

Focus group discussions provide further nuance. In several countries, particularly **Czechia, Croatia, and Serbia**, participants pointed to an **increasing reliance on foreign labour**, largely due to local workforce shortages, ageing demographics, and the declining attractiveness of manufacturing roles. However, hiring foreign workers was often described as **administratively complex**, especially when dealing with non-EU nationals. Language barriers, difficulties with integration, and legal constraints (such as quotas or slow permit procedures) were cited as challenges.

These insights suggest that while formal employment of foreign nationals remains relatively limited, the need for international recruitment may grow, especially for lower-skilled or labour-intensive roles. Yet, structural and regulatory barriers continue to hinder broader uptake across the TCLF industries.

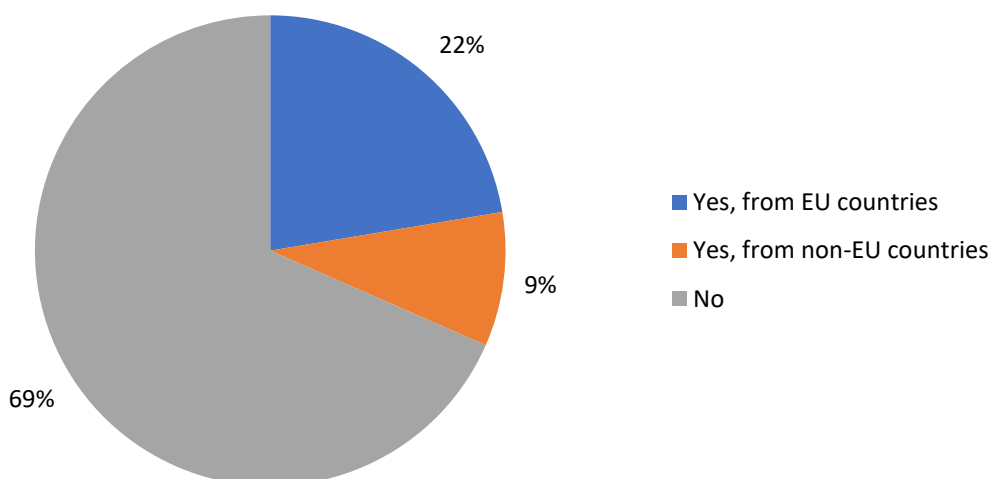


Figure 23 - Employment of foreign workers

3.5.10 Policies and practices to support migrant workers

The survey results indicate that **79%** of companies do **not have any specific policies or practices** in place to support migrant workers. This is largely due to the fact that the majority of these companies do not currently employ foreign staff. Among the minority that do, **10%** reported offering **language training**, and smaller shares provide **cultural assimilation support** or **legal and immigration assistance** (each cited by **5%** of respondents).

Focus group discussions broadly aligned with the survey results, indicating that structured policies or **practices to support migrant workers remain limited across the TCLF sectors**. In most countries, companies acknowledged that while the employment of foreign workers may become more common due to labour shortages, few have implemented formal measures to support their integration. **Language barriers** were noted as a key challenge, particularly in Slovenia and Lithuania, yet solutions such as language training or cultural orientation were typically discussed as future needs rather than established practices.

Inclusion was occasionally addressed in broader terms (such as through flexible working arrangements or diversity in recruitment) but these were rarely tailored specifically to migrant workers. The absence of coordinated approaches, whether through legal support, onboarding mechanisms, or targeted training, suggests that migrant inclusion is not yet embedded in company

workforce strategies. As demographic and labour market pressures intensify, this gap may become a strategic risk, underscoring the need for more proactive and structured integration frameworks.

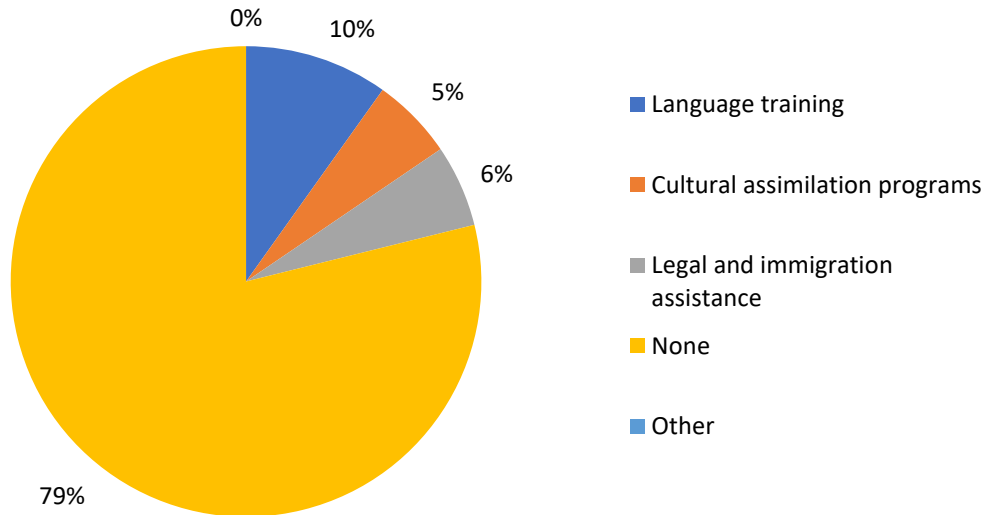


Figure 24 - Policies and practices to support migrant workers

3.5.11 Ethnic diversity in the workforce

According to company responses, **49%** reported **no ethnic diversity** in their workforce. An additional **16%** described their teams as **minimally diverse**, while **15%** indicated **some ethnic diversity**. Only **12%** reported a **moderately diverse** workforce, and just **8%** described their organisation as **highly diverse**. These figures suggest that ethnic diversity across the TCLF sectors remains limited, with the vast majority of companies operating in relatively homogenous labour environments.

Ethnic diversity was not a prominent theme in the focus group discussions, and when mentioned, it was typically addressed in general terms. Some participants in the Netherlands and Lithuania referred to broader inclusion efforts, particularly in the context of training or internships, but without specific reference to ethnic background or structured diversity strategies. In most countries, the discussion focused more on gender, age, or skills-related issues, suggesting that ethnic diversity is not currently a major focus in workforce planning or recruitment policies. This aligns with the survey results and underscores a broader gap in strategic attention to ethnic inclusion within the sector.

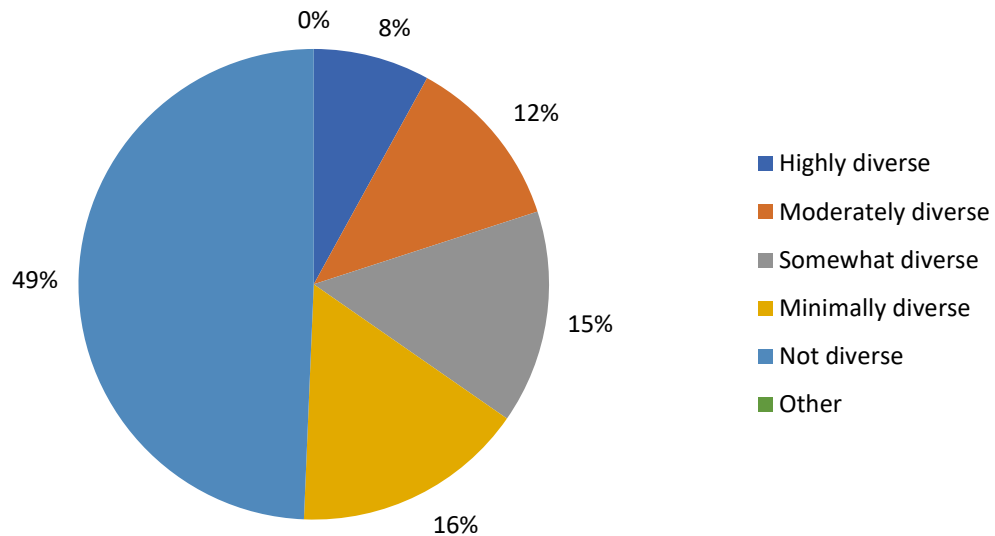


Figure 25 - Ethnic diversity in the workforce

The majority of TCLF companies report **no ethnic diversity** in leadership positions, with **64%** indicating that their management teams are entirely homogenous. This reflects the broader staff composition, where nearly half of companies reported no ethnic diversity at all. **20%** of companies noted **some degree of ethnic diversity** in leadership, while only **3%** reported **highly diverse management teams**.

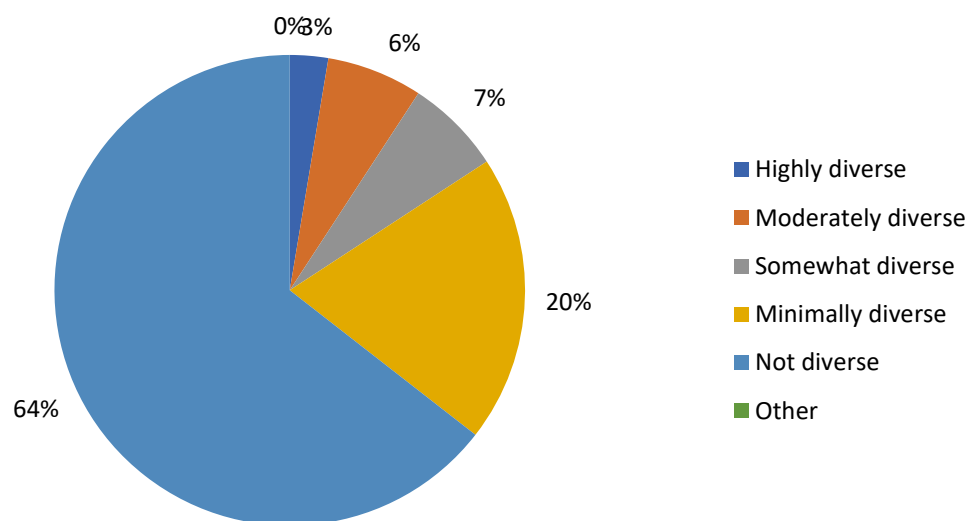


Figure 26 - Ethnic diversity in leadership roles

3.6 Analysis of Drivers of Change

This section provides an analysis of the primary drivers of change impacting the textile, clothing, leather, and footwear sectors, based on results from both the online survey and the focus group discussions. Respondents were asked to evaluate seven key external drivers using a scale from 1 (least important) to 5 (most important). The analysis below summarises these findings and outlines their strategic implications for workforce development, operational planning, and educational priorities within TCLF industries.

The seven identified drivers of change are:

- **Regulations and governance:** capturing the impact of legal frameworks, regulatory standards, and governance practices.
- **Environmental change:** encompassing the effects of sustainability concerns, climate policy, resource management, and ecological challenges.
- **Economics and globalisation:** addressing the influence of global market dynamics, trade agreements, economic shifts, and competition patterns.
- **Technological change:** reflecting the role of digitalisation, automation, advanced manufacturing, and innovation in shaping industry practices.
- **Demographic and population change:** considering workforce ageing, migration trends, and demographic shifts affecting labour availability.
- **Values and identities:** relating to cultural shifts, attitudes towards work, diversity, and inclusivity.
- **A new consumer:** highlighting changing consumer expectations, purchasing behaviours, and market demands, particularly around sustainability, transparency, and ethical considerations.

Average scores from survey responses were calculated for each driver, providing a quantitative measure of their perceived significance. The detailed results, alongside specific stakeholder insights from the focus group discussions, are presented in the following subsections, offering a comprehensive overview of how these external factors are reshaping skills requirements and strategic priorities across the TCLF value chain.

3.6.1 Regulations and Governance

Respondents were asked to assess the perceived importance of several regulatory and governance-related issues affecting the TCLF sectors. The responses clustered into three distinct groups based on average scores:

- **High-impact concerns (average scores 3.8 – 4.1):**

The most pressing issues for companies were the **impact of stricter environmental and health & safety regulations** (e.g. REACH), the **relevance of EU green economic policies** (such as the Digital Product Passport and the Corporate Sustainability Due Diligence Directive), and the **impact of new EU trade agreements**. These findings suggest that companies are highly sensitive to regulatory developments tied to sustainability and international trade, particularly when these influence compliance costs, market access, or production processes.

- **Moderate-impact concerns (average scores 3.1 – 3.2):**

Respondents placed less emphasis on the **effects of farming and raw material subsidies for non-EU producers**, the **impact of the General Data Protection Regulation (GDPR)** on operations, and **emerging trade barriers from countries like Russia, China, and Israel**. These were still seen as relevant, but not as immediately disruptive to business continuity or skills needs.

- **Low-impact concern (average score 2.7):**

The **effects of Brexit** were consistently rated as the least significant issue among those listed. This likely reflects the limited direct exposure of many TCLF companies in the participating countries to UK markets, or the waning urgency of Brexit-related disruptions now that legal frameworks have stabilised.

The focus groups provided additional context, although detailed discussion of specific legislative instruments was limited. Participants repeatedly referred to the **overwhelming pace and volume of regulatory change**, particularly in relation to the green transition. Several participants described the current regulatory environment as fragmented and unpredictable, making it difficult for companies (especially SMEs) to plan and adapt effectively.

There was broad agreement that **gradual, harmonised implementation** across EU Member States is essential to avoid confusion and competitive distortions. While some viewed new EU environmental and due diligence policies as burdensome, others saw them as **necessary and even beneficial** for

driving modernisation and levelling the playing field. Overall, the focus groups reinforced the survey finding that regulatory change is one of the most influential external forces shaping skills needs and strategic priorities in the TCLF sectors.

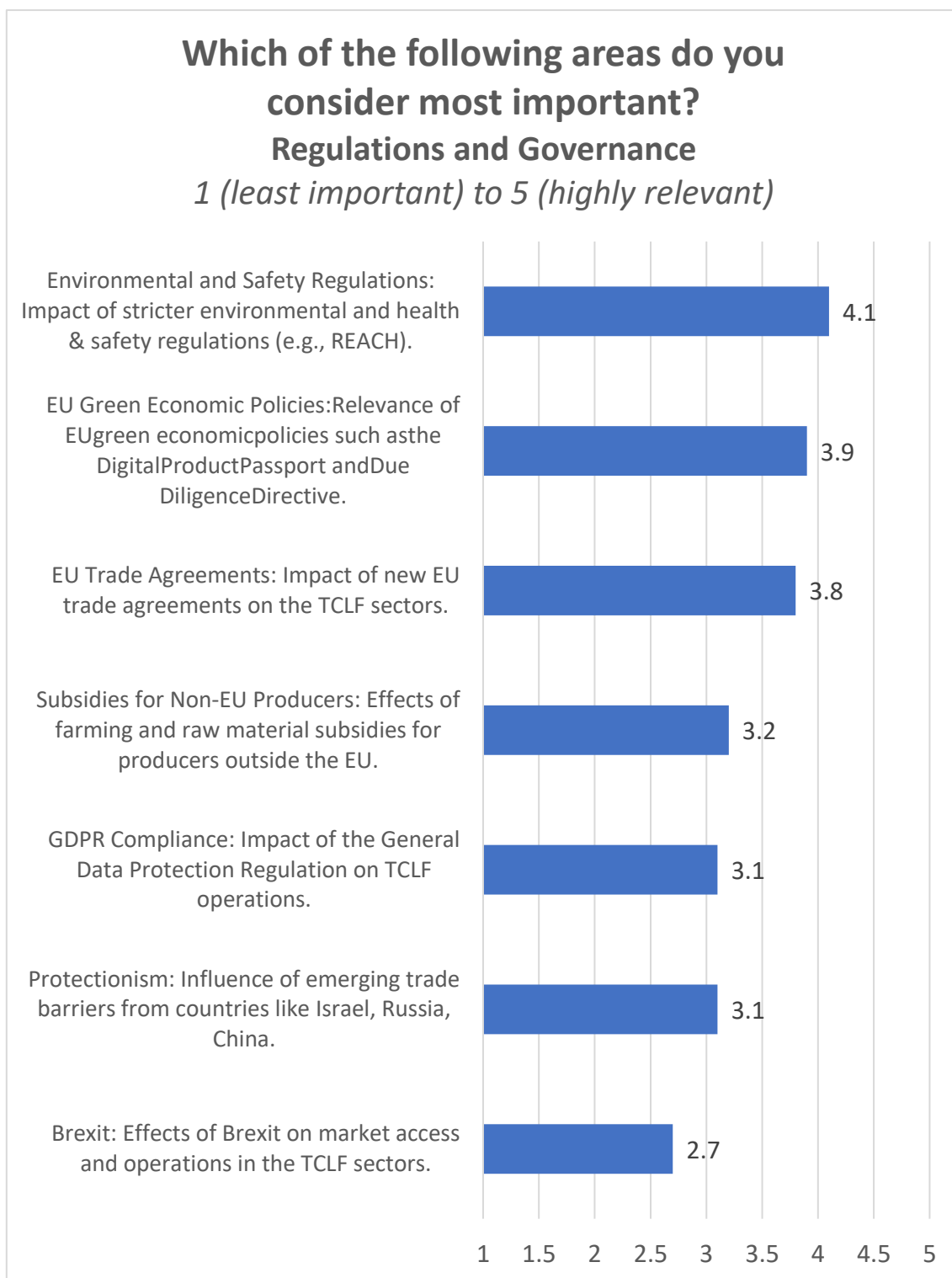


Figure 27 - Impact of regulations and governance on the TCLF sectors

3.6.2 Environmental Change

Survey respondents consistently rated **all environmental change factors as highly important**, with no single issue significantly outperforming others in perceived impact. These included consumer attitudes towards sustainability, transparency demands in sourcing, circular economy practices, rising energy and raw material costs, and external subsidies for non-EU producers. The results suggest a holistic concern among TCLF stakeholders: sustainability is no longer a niche consideration but a systemic driver of change, embedded across all stages of production and strategy.

Focus group discussions strongly reinforced these views. Participants frequently linked sustainability with emerging market dynamics, highlighting how environmental responsibility is reshaping production methods, supply chains, and even business models. Specific references were made to the **need for sustainable materials** (e.g. organic cotton, recycled fibres), low-impact processes, and **innovations like 3D printing** to reduce waste. A growing awareness of the demand for ethical and eco-friendly products was also observed, with a shared expectation that consumer behaviour will increasingly dictate industry transformation. Moreover, sustainability was described as a strategic imperative (both a regulatory pressure and a competitive advantage) that requires cross-functional collaboration, particularly in training, innovation, and long-term planning.

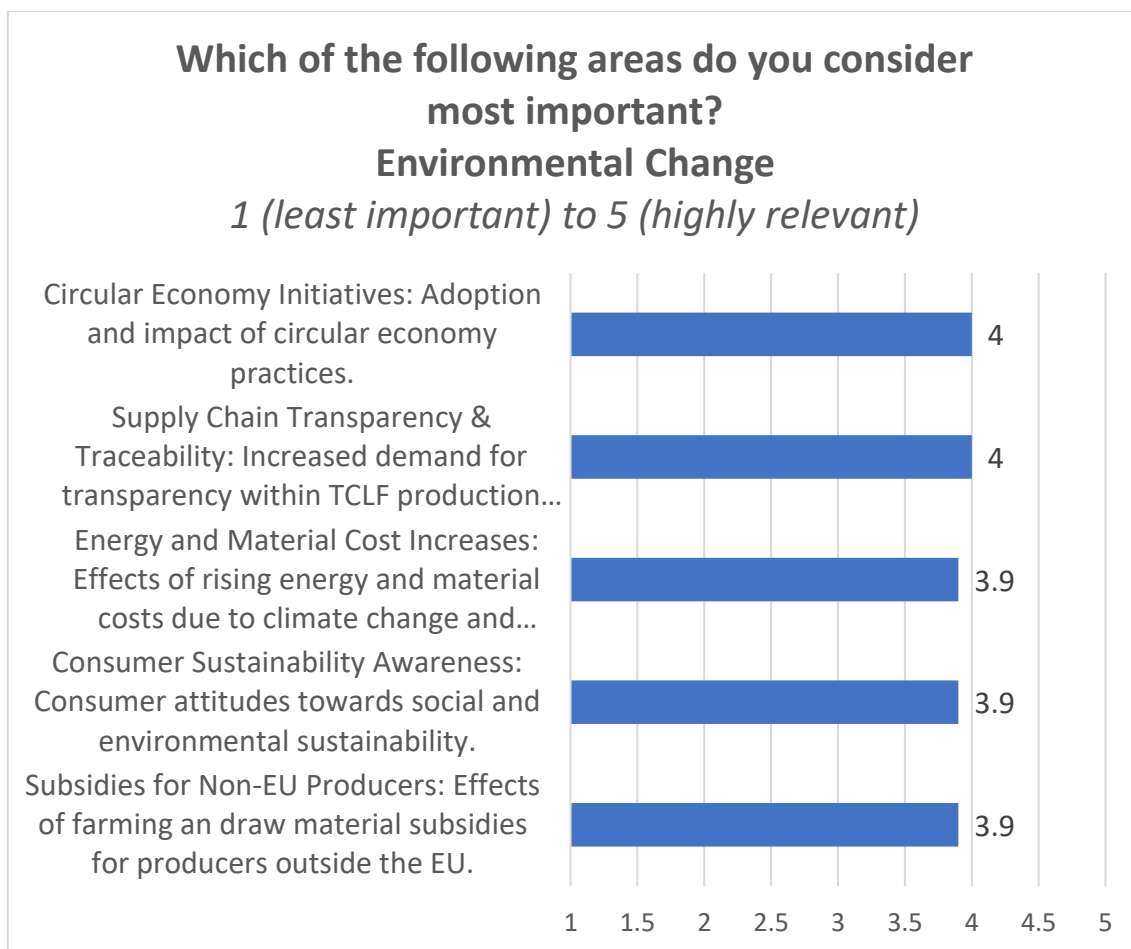


Figure 28 - Environmental change as a driver of transformation in the TCLF sectors

3.6.3 Economics and Globalisation

The survey results on "Economics and globalisation" reflect clear industry concerns about the financial and operational pressures reshaping the TCLF sectors. **Rising costs of raw materials and transportation** due to international conflicts were rated as the most pressing issue (average score: 4.0), underscoring the sector's vulnerability to geopolitical instability. The impact of **e-commerce** and multi-channelling (3.8) and **energy cost volatility** (3.7) were also viewed as significant, suggesting the need for strategic adaptation to new business models and supply risks. Conversely, the long-term economic consequences of the COVID-19 pandemic received the lowest importance rating (3.3), likely indicating that most firms have already absorbed or adapted to those disruptions.

Focus group discussions reinforced several of these concerns. Participants emphasised the **importance of reshoring and localising supply chains to enhance resilience**, as well as the need to

align teaching with future professions shaped by global developments. Notably, some companies highlighted the increasing difficulty in recruiting skilled workers, pointing to a growing reliance on **foreign labour as a potential necessity**. This mirrors broader concerns about workforce sustainability in a rapidly shifting global economy.

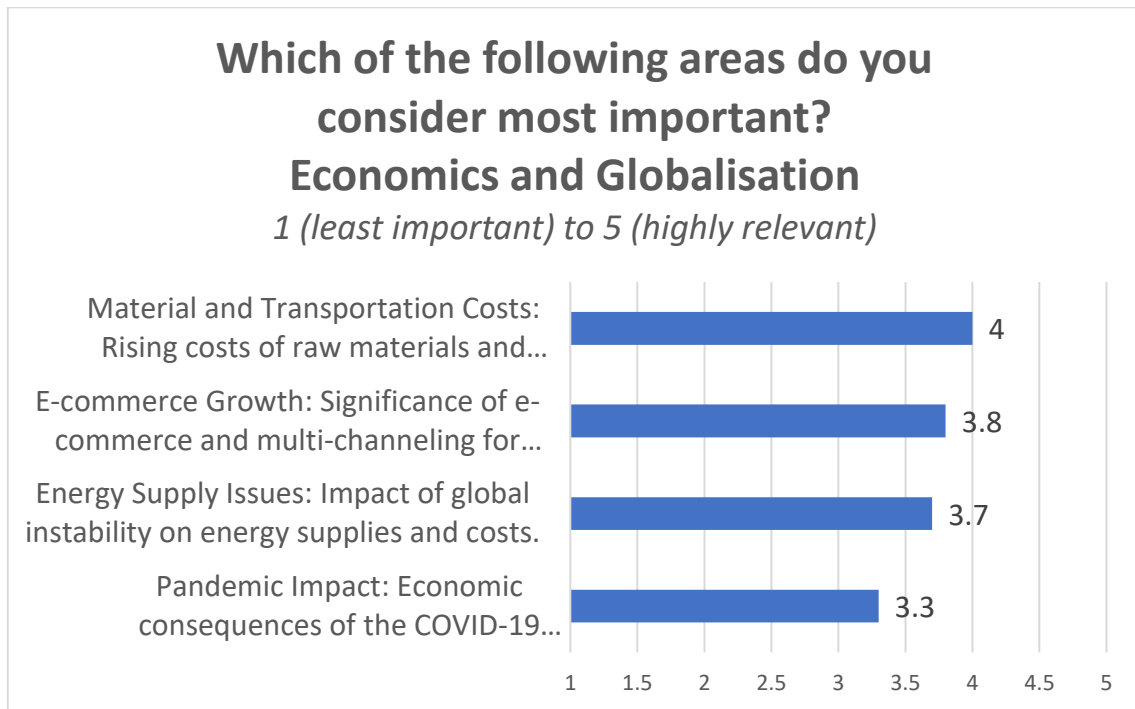


Figure 29 - Perceived impact of economic and globalisation-related factors on the TCLF sector

3.6.4 Technological Change

The survey results reveal that respondents within the TCLF sectors view the impact of technological change through a clear hierarchy of urgency and relevance. Foremost among concerns is the **adoption of advanced manufacturing processes and materials**, which received the highest importance score (4.2). This reflects the sector's recognition that upgrading production technologies is essential to maintaining competitiveness and responding to global pressures on cost and efficiency. A close second is the growing role of **research and development and knowledge-based initiatives** (3.8), highlighting the sector's orientation towards innovation-driven growth. In contrast, technologies such as the Internet of Things (3.4) and augmented reality (3.4) are seen as less critical at present (likely due to their limited integration in traditional production workflows or the high investment threshold they require). While 3D printing and rapid prototyping ranked in the middle

range (3.6), their relevance is expected to grow, especially for sampling and short-run production in fashion.

In the focus group discussions, the direction of change identified in the survey was strongly affirmed. Participants repeatedly underscored the urgency of **investing in automation and digitalisation** to improve productivity and reduce material costs. Emphasis was placed on **ensuring that companies have access not only to new technologies, but also to sufficiently trained and adaptable staff** capable of using them effectively. This view supports the conclusion that technological transformation is not solely a matter of machinery, but also of human capital. The discussions also touched on the need for ongoing collaboration between educational providers and industry to anticipate skills requirements and ensure training content reflects evolving technological demands.

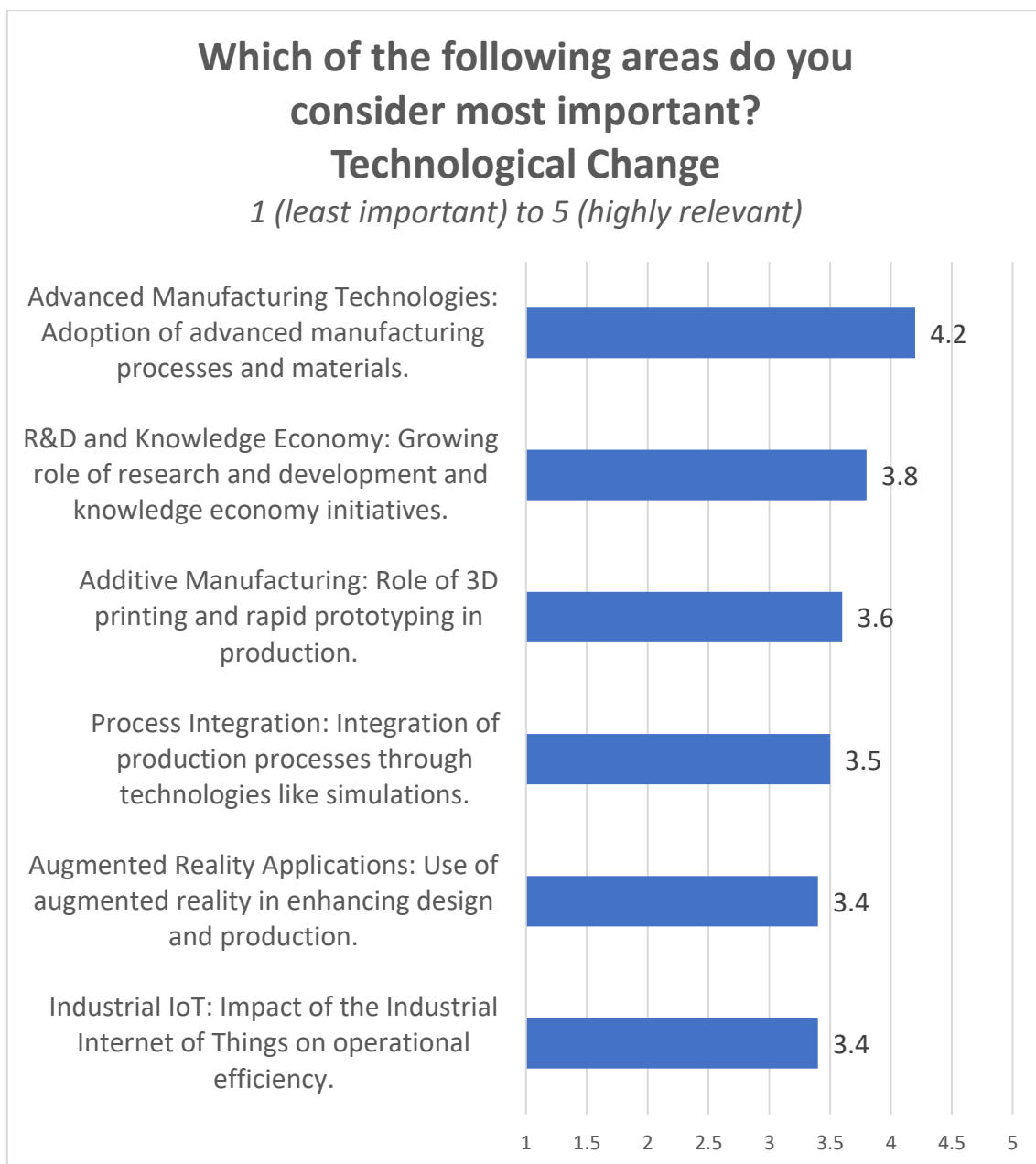


Figure 30 - Impact of technological change in TCLF

3.6.5 Demographic and Population Change

Among the thematic blocks explored in the survey, “Demographic and Population Change” emerged as a significant area of concern, particularly in relation to the **attractiveness of TCLF sectors to younger generations**. This item received the highest importance score (4.1), reflecting a critical awareness that the **future competitiveness of the sector hinges on its ability to engage new talent**. Closely following was the issue of an **ageing workforce** (4.0), highlighting the dual challenge of

replacing retiring staff while maintaining institutional knowledge. The need for **enhanced digital skills within the workforce** also scored highly (3.8), reinforcing the urgency of reskilling and upskilling as part of demographic transitions. Adaptation to older consumer demographics (3.6) and diversity and inclusion within the workforce (3.5) were rated as comparatively less urgent but still noteworthy considerations. Collectively, these responses suggest a complex demographic shift requiring strategic human resource planning and modernised skills development initiatives across the TCLF value chain.

Focus group discussions substantiated these findings by pointing to an observable generational turnover in the sector. Participants expressed concern that **technically competent workers are leaving the industry**, and the **emerging generation is neither adequately trained nor sufficiently interested in TCLF careers**. Particular emphasis was placed on the widening skills gap, especially as younger professionals show limited interest in manufacturing roles and lack exposure to the realities of industrial work environments. Stakeholders called for renewed efforts to enhance the attractiveness of the sector through **better visibility of career paths, updated vocational education, and closer collaboration with companies**.

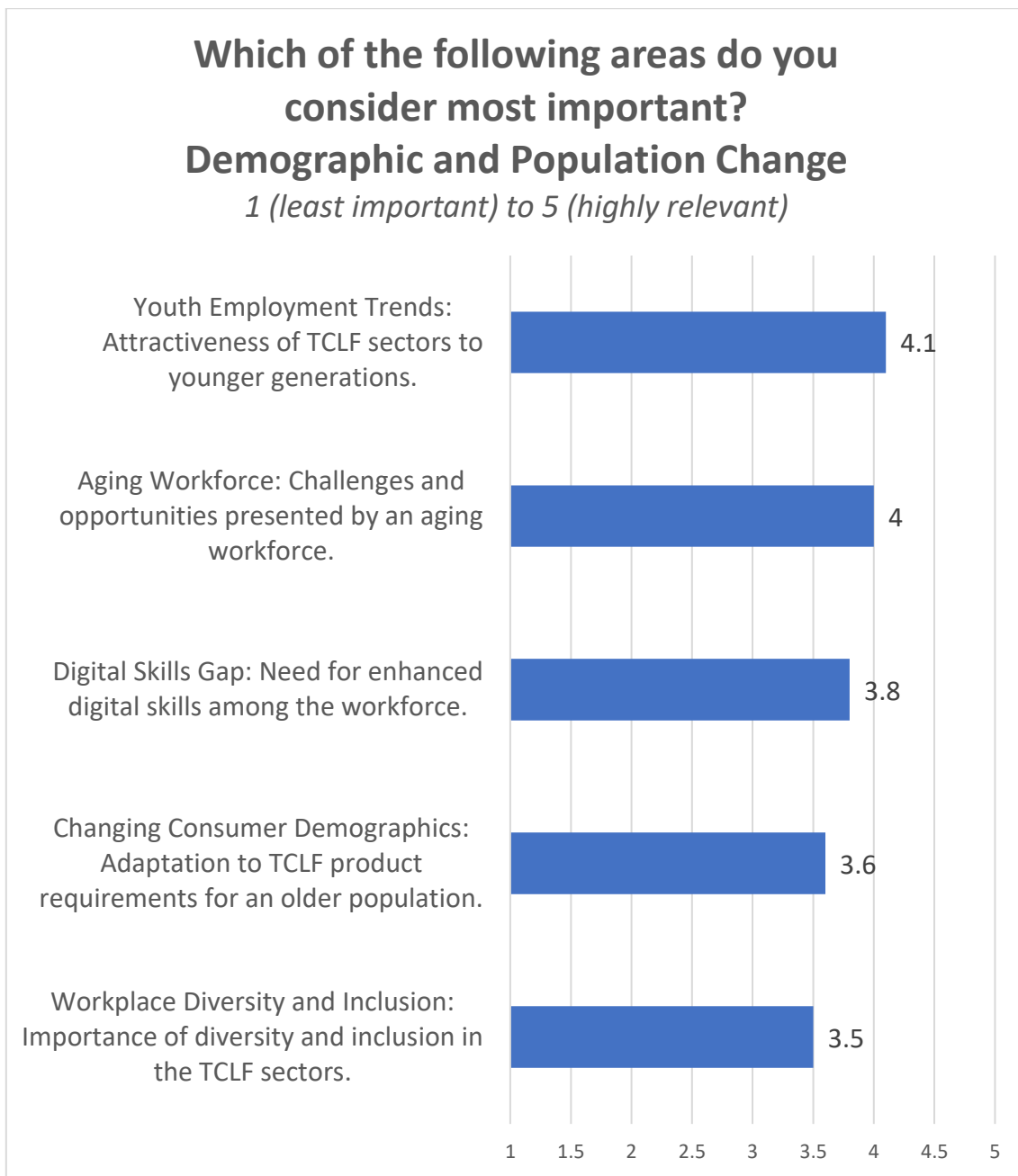


Figure 31 - Perceived impact of demographic and population change on the TCLF sectors

3.6.6 Values & Identities

Based on the survey data, the most significant challenge under the "Values and identities" driver was the **difficulty in attracting young talent to technical positions in the TCLF sector**, with an average importance score of 4.1. This was followed closely by the **difficulty in attracting STEM graduates**, with a score of 3.8, reflecting a widespread concern about the lack of appeal these sectors hold for technically skilled individuals. The growing influence of the second-hand market also emerged as a concern (3.4), indicating the sector's awareness of shifting consumer behaviour and its implications for traditional business models. The lowest-rated issue was the integration of immigrants and refugees into the workforce (3.0), which may reflect the limited extent of migrant employment in some national contexts.

In focus group discussions, several countries echoed concerns about the declining interest of young people in pursuing TCLF careers. For instance, Croatian stakeholders repeatedly highlighted that many **young people are disinterested in factory work, find the sector unattractive, and are deterred by low wages**, while several vocational schools in other countries also reported difficulties in motivating students to pursue specialised TCLF training. The Netherlands raised similar concerns, citing **young talent abandoning the industry for entrepreneurial paths** after early disillusionment. However, there was little to no mention of the second-hand sector or refugee integration in these discussions, suggesting these topics may be less immediate priorities at the local level. Overall, the focus groups reinforced the urgency of making TCLF careers more attractive to younger generations and better aligned with contemporary expectations.

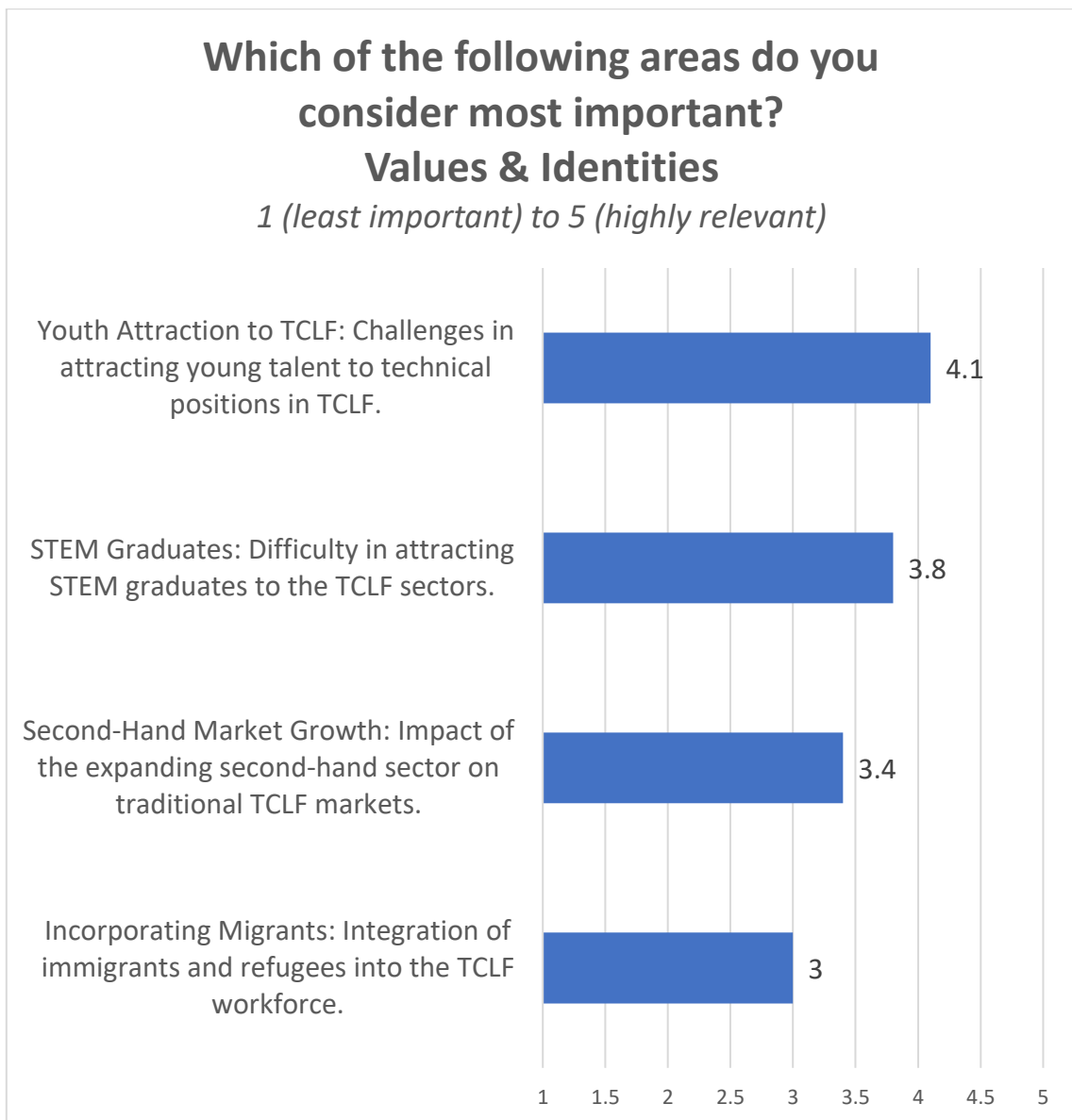


Figure 32 - Perceived impact of values and identity-related challenges on the TCLF sectors

3.6.7 A New Consumer

Survey responses reveal a broad awareness within the TCLF sectors of how evolving consumer preferences are reshaping product development and retail strategies. The two most influential trends, each with an average score of 4.0, were the **effect of price sensitivity** and **consumer preference for local or national branding**. These results suggest that affordability and authenticity are viewed as core purchasing drivers in current markets.

Closely following, the **growing consumer focus on healthier lifestyles** (and its influence on product design) scored 3.9, pointing to a recognised demand for ergonomically and functionally adapted

goods. Respondents also highlighted the **impact of online sales on traditional retail models** (3.8) and the rising interest in **personalised TCLF products** (3.7) as important forces. By contrast, demand for high-end and luxury items received the lowest average score (3.4), suggesting that premium segments, while present, are not seen as central to the sector's future direction.

Discussions related to the "new consumer" theme were limited in scope but aligned with survey findings on key issues. Participants most frequently referenced the **growing need for product personalisation** and the importance of **improving communication between producers and consumers**. These themes were tied to broader concerns around maintaining relevance in fast-changing markets, though no detailed recommendations were offered regarding luxury goods, health-conscious design, or e-commerce trends.

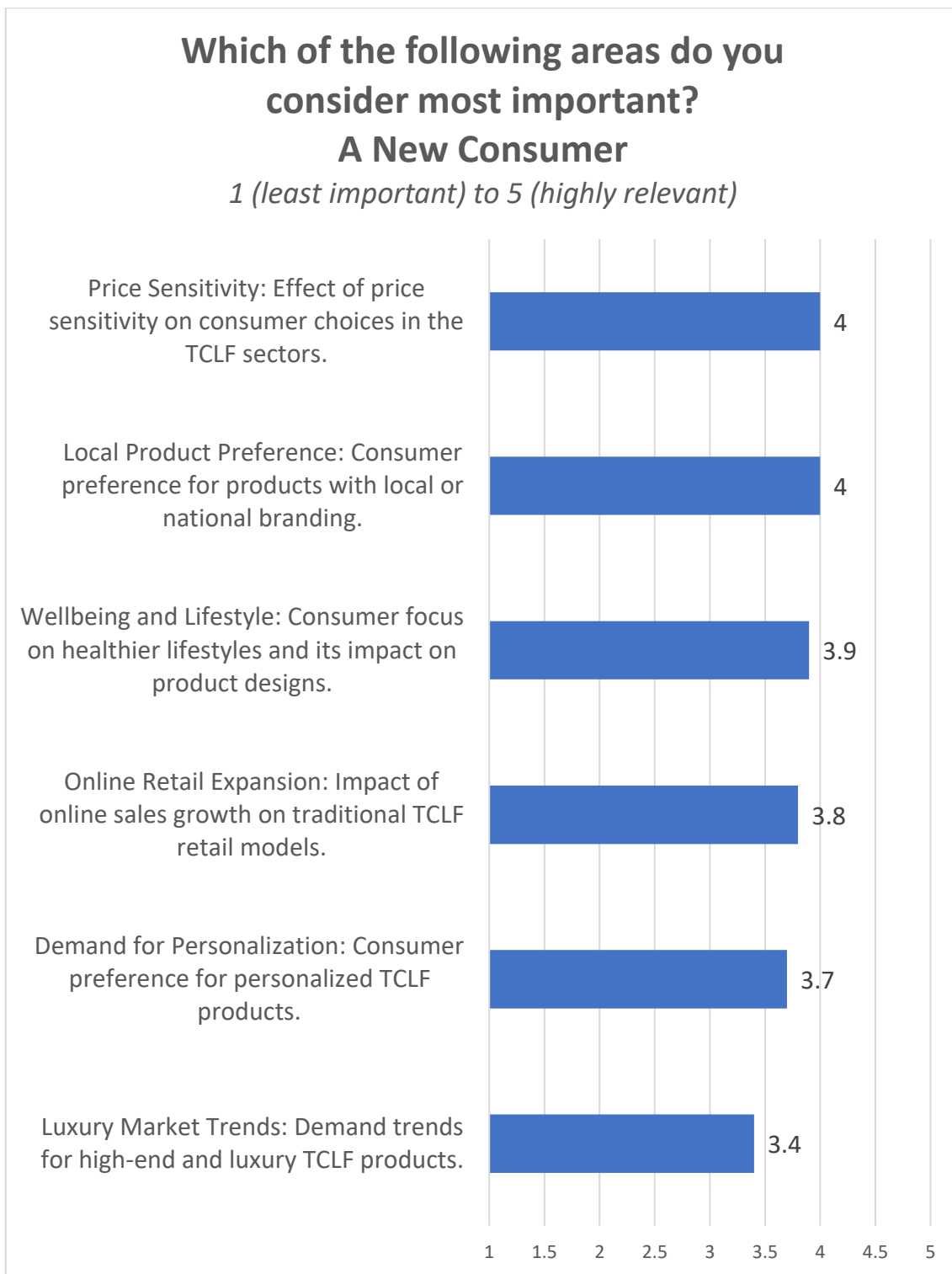


Figure 33 - Perceived impact of evolving consumer preferences on the TCLF sectors

4 CONVERGENCE OF FINDINGS

This section synthesises critical insights derived from both the focus group discussions and survey responses, emphasising converging themes from industry and academia stakeholders regarding skills gaps in the TCLF sectors.

Several key areas of alignment were identified across both research methods:

4.1 Curriculum and Industry Misalignment

A significant misalignment between existing educational curricula and the actual practical requirements of TCLF enterprises was consistently highlighted by stakeholders from both industry and academia. This structural issue has emerged as a primary concern from both survey responses and focus group discussions. Stakeholders from both sectors identified a critical gap in effective collaboration and structured dialogue, essential for keeping curricula aligned with the rapidly evolving workplace demands in the textile, clothing, leather, and footwear industries.

Industry representatives expressed concern that current graduates entering the workforce often lack critical skills needed for immediate productivity and adaptability, particularly emphasising the necessity of embedding contemporary digital tools and sustainability practices into training programmes.

Academia stakeholders echoed this view, acknowledging limitations in responsiveness and flexibility within current curricula frameworks. They highlighted the limited and sporadic interactions with industry as significant barriers, thus preventing timely updates that reflect actual industry conditions and evolving skill needs.

Both stakeholder groups strongly recommended practical measures, including curriculum revisions to integrate digital and sustainability skills, and establishing formal, structured platforms that regularly facilitate dialogue between industry and educational providers. These steps, they argued, are crucial to ensure educational programmes are responsive to industry requirements and effectively address the identified skills gaps.

4.2 Digital Competence Deficit

Survey data and focus group feedback consistently pointed to a widespread shortage of digital skills across the TCLF sectors. Industry stakeholders reported increasing difficulty in finding employees who possess the necessary competences to work with modern digital tools and systems. Specific areas of concern included digital design tools, automated production systems, and digital workflows that are becoming standard in many parts of the industry.

Focus group participants from industry elaborated that the pace of technological change is outstripping the rate at which workers are being trained, leaving a significant capability gap. This was viewed as a major constraint on the competitiveness and innovation potential of TCLF companies, particularly small and medium-sized enterprises.

On the academic side, participants acknowledged that existing programmes often do not include sufficient exposure to new technologies. Limitations cited included outdated infrastructure, lack of faculty expertise in specific emerging technologies, and difficulty in accessing up-to-date equipment and software.

Both stakeholder groups called for urgent updates to educational content to reflect technological developments and ensure future workers are equipped with relevant digital skills. There was also agreement on the need for stronger collaboration between companies and education providers to help inform the integration of digital technologies into teaching practices. The convergence of these views reinforces the conclusion that bridging the digital skills gap is critical to ensuring the adaptability and long-term sustainability of the TCLF sectors.

4.3 Sustainability and Green Skills

Both survey and focus group participants underscored the growing importance of sustainability within the TCLF sectors. Stakeholders from industry described increased pressure to meet regulatory requirements related to sustainable production, as well as rising expectations from consumers around transparency, circularity, and environmental responsibility.

Despite this growing demand, participants widely agreed that the current workforce lacks adequate training in green skills. Industry representatives explained that many workers are unfamiliar with sustainability frameworks, environmentally friendly materials, or circular economy principles. This gap makes it challenging for companies to adapt to new sustainability standards and implement more responsible production methods.

Academic stakeholders confirmed that sustainability is not yet systematically embedded in most TCLF curricula. Although some efforts are being made to include topics such as eco-design and sustainable processes, the coverage remains inconsistent and is often limited to theoretical content rather than practical application.

The findings from both groups indicate a clear need to strengthen the integration of sustainability in education and training. This includes updating existing programmes to include modules on sustainable practices, life-cycle thinking, and regulatory compliance related to environmental impact. There was also agreement on the importance of enhancing cooperation between education providers and companies to ensure that training on sustainability is not only relevant but also responsive to real-world implementation needs.

Together, the perspectives from both industry and academia highlight a strong convergence: sustainability is no longer optional, and green skills must become a central pillar of workforce development in the TCLF sectors.

4.4 Transversal Skills Importance

The importance of transversal skills (such as critical thinking, adaptability, teamwork, communication, and problem-solving) was a recurring theme in both the survey data and focus group discussions. Stakeholders from both industry and education sectors acknowledged that these skills are increasingly vital for workers in the TCLF industries, especially given the pace of technological change, evolving consumer behaviour, and shifting production models.

Industry participants emphasised that while technical expertise remains crucial, it is the ability to adapt to new processes, solve complex problems, and work effectively in diverse teams that often

determines a worker's long-term success. These qualities are particularly important in dynamic production environments, where roles and responsibilities are frequently evolving in response to digitalisation and sustainability goals.

Academic representatives similarly recognised that transversal skills are not consistently or sufficiently embedded in existing curricula. Although some transversal competences are addressed indirectly through project-based learning or soft skills workshops, stakeholders noted the need for a more deliberate and structured approach to ensure that these skills are developed alongside technical training.

Both groups supported the inclusion of transversal competences as explicit learning outcomes in vocational and higher education programmes. There was also shared agreement on the value of incorporating more experiential learning, real-world problem-solving activities, and collaborative projects that mirror the demands of modern workplaces.

In summary, the convergence around transversal skills reflects a shared understanding: the future TCLF workforce must not only be technically proficient, but also agile, collaborative, and capable of continuous learning in order to thrive in a sector undergoing rapid transformation.

4.5 Sector Attractiveness and Workforce Challenges

Both focus group participants and survey respondents from industry and academia expressed concern about the declining attractiveness of the TCLF sectors, particularly among younger generations. The perception of the sector as outdated, low-tech, and offering limited career progression opportunities was frequently cited as a significant barrier to attracting new talent.

Industry stakeholders pointed to difficulties in recruiting qualified workers, especially in technical and mid-level roles. They noted that while the sector has undergone substantial changes (embracing digitalisation, sustainability, and modern design practices) public awareness of these changes remains limited. As a result, potential recruits often overlook the TCLF industries in favour of sectors perceived to be more innovative or future-oriented.

From the perspective of academia, participants acknowledged that student enrolment in TCLF-related study programmes has declined in recent years. Educators linked this trend to limited visibility of TCLF career pathways and insufficient information about new roles emerging in the sector. They also noted that promotional efforts often fail to reflect the modern realities and evolving opportunities available in the industry.

Stakeholders from both sectors agreed that strategic communication and outreach campaigns are needed to reshape the image of the TCLF industries. These efforts should highlight the sector's transformation, the integration of digital and sustainable practices, and the diverse career opportunities now available. Both groups also emphasised the value of showcasing successful professionals and innovative companies as a way of inspiring younger audiences.

This alignment demonstrates that addressing workforce shortages in the TCLF sectors will require not only educational reform and upskilling, but also concerted efforts to redefine the sector's identity and make it more appealing to future workers.

4.6 Demographic and Inclusivity Challenges

Demographic trends and inclusivity barriers were identified by both industry and academic stakeholders as pressing concerns affecting the sustainability of the TCLF workforce. Survey results and focus group discussions highlighted a shared recognition of the sector's ageing workforce, coupled with low participation rates among underrepresented groups, particularly women in technical roles and migrant workers in formal training pathways.

Industry participants noted the increasing difficulty in maintaining workforce numbers as experienced employees retire, especially in regions where younger people are not entering the sector. They also highlighted challenges in diversifying the workforce, pointing out that while many companies employ migrant labour, structured upskilling and integration opportunities for these groups are often lacking. This was seen as both a missed opportunity and a risk to long-term workforce stability.

Academic stakeholders echoed these concerns, acknowledging that inclusivity efforts in education and training are inconsistent. Focus group discussions revealed that while some institutions have made efforts to promote gender balance and support migrant learners, many still lack targeted strategies or adequate support services. Furthermore, existing curricula and teaching methods may not be fully accessible to learners from diverse educational and cultural backgrounds.

Both groups supported the development of more inclusive and flexible training models, including adult education pathways, language support for migrants, and initiatives to encourage women's participation in technical and leadership roles. There was also a consensus that closer collaboration between training providers and employers could help tailor programmes to the specific needs of underrepresented groups, improving both participation and outcomes.

Overall, the convergence of views underlines the importance of equity and inclusivity in workforce development. Stakeholders agreed that targeted support and inclusive training structures are essential for addressing demographic shifts and ensuring that all segments of society can contribute to and benefit from employment opportunities in the TCLF sectors.

4.7 Need for Structured Collaboration Platforms

A strong consensus emerged from both survey responses and focus group discussions on the necessity of improving collaboration between educational institutions and the TCLF industry. Stakeholders from both sides pointed out that current cooperation is often ad hoc, informal, or limited in scope, which hampers the ability to align training content with real-world skills needs effectively.

Industry participants noted that while some companies maintain relationships with local VET or HE institutions, these interactions are not always systematic or sustained. This limits the extent to which employers can provide meaningful input into curriculum development or participate in shaping training pathways that respond to evolving industry requirements.

Academic stakeholders, for their part, acknowledged that they often lack formal mechanisms or incentives to engage regularly with industry. This disconnect results in delayed updates to curricula

and insufficient integration of emerging practices into teaching. Educators expressed a desire for more structured and predictable collaboration, including joint planning of course content, regular feedback mechanisms, and shared involvement in work-based learning initiatives.

Both groups expressed support for the creation or reinforcement of structured collaboration platforms that bring together industry, education providers, and where possible public authorities. These platforms would serve to ensure continuous dialogue, facilitate mutual understanding of challenges and expectations, and allow for co-creation of curricula and training strategies.

The alignment in these perspectives highlights the critical role of institutionalised partnerships in bridging the gap between education and employment. Strengthening these connections is seen as a foundational step toward ensuring that training systems remain responsive, relevant, and capable of preparing learners for the demands of the modern TCLF workforce.

4.8 Drivers of Change in the TCLF Sectors

Both survey results and focus group discussions across the seven participating countries revealed a shared understanding among stakeholders that the TCLF sectors are undergoing profound transformation, shaped by a combination of external and internal forces. These drivers of change are not hypothetical or distant; they are already influencing daily operations, educational priorities, and the overall direction of sector development. The most frequently cited driver was technological change. Participants from industry consistently described the growing impact of digitalisation, automation, and artificial intelligence on production processes and workflows. The integration of smart technologies was seen as not only inevitable but essential for maintaining competitiveness, with an urgent need for workers who can operate, manage, and adapt to digitally enabled environments. Educational providers echoed this view, acknowledging that many institutions struggle to incorporate these technologies into training due to infrastructure constraints and limited staff expertise. This gap between technological development and the pace of curriculum modernisation was a source of concern across all countries studied.

In parallel, sustainability emerged as a second dominant driver, particularly shaped by increasing regulatory demands and shifting consumer expectations. Participants reported a marked rise in

pressure to align with environmental standards, circular economy models, and product traceability systems. While larger firms were more likely to have strategies in place to address these demands, small and medium-sized enterprises often found themselves underprepared, both in terms of resources and skilled personnel. Academia, in turn, recognised the need to embed sustainability across disciplines, but described challenges in translating broad environmental concepts into practical teaching modules that align with workplace requirements. In both datasets, sustainability was not treated as an optional or temporary concern, but rather as a long-term structural shift that will continue to redefine job roles and skill sets in the TCLF sectors.

Demographic changes were also viewed as shaping workforce dynamics, with the ageing of the current labour force and the difficulty of attracting young people into the sector being widely discussed. The risk of losing specialised knowledge due to retirement, combined with a lack of clear, attractive career pathways for younger generations, was flagged as a potential future bottleneck. These concerns were particularly prominent in countries with traditional TCLF manufacturing bases, where companies already struggle to replace outgoing workers. While education providers acknowledged the issue, they also pointed to limited capacity to influence sector image or conduct sustained outreach. Still, the convergence around these challenges suggests that without targeted interventions, such as inclusive recruitment practices and modernised branding of the sector, talent shortages will become more acute.

Additional factors, such as evolving consumer preferences and complex regulatory landscapes, were also mentioned as part of a broader transformation. Industry stakeholders described a growing demand for personalised, locally produced, and ethically manufactured goods (trends that require not only technical adaptation but also new forms of customer engagement and product development). At the same time, the rapid and sometimes fragmented introduction of new EU regulations, particularly on sustainability and transparency, was reported to create uncertainty and implementation challenges, especially for SMEs. Though less emphasised by academic participants, this regulatory environment was acknowledged as an area where closer cooperation and shared understanding between sectors could improve readiness and reduce friction.

Taken together, these feedbacks point to a sector in flux—shaped by digital, environmental, demographic, and consumer shifts that are all interlinked. What emerges from the combined

evidence is the recognition that the future resilience of the TCLF sectors depends on the ability of both industry and education to anticipate and adapt to these external pressures. Strategic foresight, flexible curriculum design, and deeper cross-sector collaboration are repeatedly mentioned as prerequisites for equipping the workforce with the skills needed to navigate these changes.

5 CONCLUSION

The research and analysis across the seven countries highlights a range of interconnected needs within the textile, clothing, leather, and footwear sectors. Surveys and focus groups indicate that digital proficiency, sustainability expertise, and strong transversal skills remain essential for the future workforce. Employers and education providers both acknowledge that a mismatch exists between existing curricula and the practical realities of modern industry. Addressing demographic and inclusivity barriers also emerged as a critical focus, particularly with an ageing workforce and limited engagement from younger candidates. Stakeholders emphasised the importance of proactive outreach, improvements to the public image of the sector, and structured collaboration to ensure that training programmes remain relevant and up to date.

Findings further underscore the influence of external drivers of change, including technological innovation, new regulatory requirements, and shifting consumer preferences, all of which are shaping workforce needs and strategic decision-making. Close cooperation between industry and educational institutions, alongside supportive policy measures, is essential if the TCLF sectors are to respond swiftly and effectively to these evolving demands. Participants in both the surveys and focus groups agreed that well-designed, collaborative platforms can accelerate curriculum reform, raise awareness of career opportunities, and foster more resilient business models.

The in-depth feedback gathered throughout this deliverable reveals a widespread awareness of the challenges facing the TCLF industries and suggests a clear appetite for practical, forward-thinking solutions. The sector's capacity to thrive depends on the willingness of all involved to integrate new technologies, reduce environmental impact, and create an inclusive environment for workers of diverse backgrounds. Through a focus on strategic, cooperative approaches, it will be possible to develop more dynamic learning pathways and future-ready skill sets.

Deliverable 3.2 draws together the perspectives of those who shape, teach, and work within these sectors. The conclusions here, centred on skills gaps, drivers of change, and collaborative needs, will inform the broader analysis developed in Deliverable 3.3. The combinations of insights from desk-based research with the evidence assembled during fieldwork, the next stage will refine and expand

D3.2: Qualitative Evidence Report on Skills Needs in the TCLF Industry

on these recommendations, guiding stakeholders to concrete actions that support a vibrant and competitive TCLF ecosystem.

6 ANNEXES

6.1 Survey Questions

SECTION	QUESTIONS	OPTIONS FOR RESPONSE
1	General information	Which is your sector?
		Textile Clothing Leather Footwear
		Name
		Of company/institution
		Entity Nationality
		NL/CZ/SI/HR/RS/LT/FI
		Which type of entity are you?
2	For Academia (HE/VET providers)	VET/HE Centre - Company - Sectorial Association - Local/Regional Authority - Other
		Contact person
		Name and Surname
		Job Position
		Contact - email
		Email
		Which crucial skills for your sector do you feel are most lacking in current graduates?
		Technical skills Soft skills (communication, teamwork) Digital literacy Management and leadership Problem-solving and critical thinking Sustainability practices Other (please specify)
		In which areas do you feel your current curricula are failing to meet industry standards?
		Curriculum outdated Insufficient practical training Lack of modern technology/equipment Limited industry exposure Not aligned with current market demands Other (please specify)

	What changes in skill requirements do you anticipate over the next 5-10 years in your sector?	Increased need for digital skills Greater emphasis on sustainability Advanced technical skills for new machinery More cross-disciplinary knowledge required Leadership and entrepreneurial skills Other (please specify)
	How is your institution preparing to integrate these future skills into existing curricula?	Developing new courses Updating existing courses Partnering with industry experts Investing in new technologies Enhancing practical training opportunities Other (please specify)
	To what extent has your institution integrated new technologies into the curriculum?	Fully integrated across all programs Integrated in specific programs only Partially integrated with plans to expand Minimally integrated due to constraints Not integrated at all Other (please specify)
	What types of new technologies have been adopted in your educational programs?	Advanced machinery and equipment Virtual Reality (VR) and Augmented Reality (AR) Artificial Intelligence (AI) and machine learning tools Digital design and manufacturing software Online learning platforms Other (please specify)
	What are the main barriers to adopting new technologies in your curriculum?	High cost of new technologies Lack of technical expertise among staff Insufficient infrastructure Resistance to change

			Lack of funding Other (please specify)
		What is the current mix of online and in-person training at your institution?	Fully online Mostly online with some in-person elements Balanced mix of online and in-person Mostly in-person with some online elements Fully in-person Other (please specify)
		How effective do you believe your current curricula are in preparing students for their careers in the TCLF sector?	Very ineffective Somewhat ineffective Neutral Somewhat effective Very effective Other (please specify comments)
		How effectively does your curriculum integrate current technologies and innovations relevant to the industry?	Extremely effectively Very effectively Moderately effectively Slightly effectively Not at all effectively Other (please specify)
		Do you currently collect feedback from industry stakeholders regarding your training programs?	Yes No
		If so, how do you do it?	Regular meetings with industry panels Student internships and their feedback Surveys and questionnaires Joint projects with companies

			External audits and evaluations Other (please specify)
		What are the main barriers you face in implementing feedback from industry partners?	Financial constraints Regulatory restrictions Limited faculty expertise Inadequate industry engagement Resistance to change within the institution Other (please specify)
3	For COMPANIES	What is the size of your company?	Small (1-50 employees) Medium (51-250 employees) Large (251+ employees) Other (please specify)
		Which part of the TCLF supply chain does your company primarily operate in?	Raw materials extraction Raw materials processing Material production Finishing/ Assembly Wholesale, Retail and distribution Recycling and waste management Other (please specify)
		Which skills are most critical for your current operations?	Technical skills related to TCLF Soft skills (e.g., communication, teamwork) Digital literacy Sustainability and environmental management skills Problem-solving Adaptability Other (please specify)

	Which skills do you anticipate will become more important over the next 5-10 years?	Advanced machine operation Software proficiency Environmental and sustainability awareness Advanced problem-solving Leadership and management Other (please specify)
	How do you assess the adequacy and effectiveness of training programs provided by HE/VET providers?	Very adequate and effective Adequate and mostly effective Adequately meets some needs but not others Inadequate and ineffective Not applicable/Do not use HE/VET providers Other (please specify)
	How do you typically communicate your training needs and feedback to educational providers?	Through formal partnership agreements Via direct communication (emails, meetings) Through industry associations We do not communicate feedback Other (please specify)
	What initiatives do you have to promote gender balance within your company?	Targeted recruitment Professional development for underrepresented genders Work-life balance accommodations Pay equity audits None Other (please specify)
	What is the gender diversity like in your workforce (overall)?	Predominantly male Mostly male, but with significant female representation Balanced gender representation Mostly female, but with significant male representation

			Predominantly female Other (please specify)
		And in leadership roles?	Predominantly male Mostly male, but with significant female representation Balanced gender representation Mostly female, but with significant male representation Predominantly female Other (please specify)
		Does your company employ workers from foreign countries?	Yes No
		What policies or practices do you have in place to support migrant workers?	Language training Cultural assimilation programs Legal and immigration assistance None Other (please specify)
		What is the ethnic diversity like in your workforce (overall)?	Highly diverse Moderately diverse Somewhat diverse Minimally diverse Not diverse Other (please specify)
		And in leadership roles?	Highly diverse Moderately diverse Somewhat diverse Minimally diverse Not diverse Other (please specify)

4	For Everyone	Regulations and Governance	EU Trade Agreements: Impact of new EU trade agreements on the TCLF sectors. Brexit: Effects of Brexit on market access and operations in the TCLF sectors. Protectionism: Influence of emerging trade barriers from countries like Israel, Russia, China. EU Green Economic Policies: Relevance of EU green economic policies such as the Digital Product Passport and Due Diligence Directive. GDPR Compliance: Impact of the General Data Protection Regulation on TCLF operations. Subsidies for Non-EU Producers: Effects of farming and raw material subsidies for producers outside the EU. Environmental and Safety Regulations: Impact of stricter environmental and health & safety regulations (e.g., REACH).
		Environmental Change	Consumer Sustainability Awareness: Consumer attitudes towards social and environmental sustainability. Supply Chain Transparency: Increased demand for transparency within TCLF production and sourcing. Circular Economy Initiatives: Adoption and impact of circular economy practices. Energy and Material Cost Increases: Effects of rising energy and material costs due to climate change and geopolitical factors.

		Economics and Globalisation	Material and Transportation Costs: Rising costs of raw materials and transportation due to international conflicts. Pandemic Impact: Economic consequences of the COVID-19 pandemic on TCLF sectors. Energy Supply Issues: Impact of global instability on energy supplies and costs. E-commerce Growth: Significance of e-commerce and multi-channelling for TCLF sectors.
		Technological Change	Advanced Manufacturing Technologies: Adoption of advanced manufacturing processes and materials. Additive Manufacturing: Role of 3D printing and rapid prototyping in production. Augmented Reality Applications: Use of augmented reality in enhancing design and production. Process Integration: Integration of production processes through technologies like simulations. Industrial IoT: Impact of the Industrial Internet of Things on operational efficiency. R&D and Knowledge Economy: Growing role of research and development and knowledge economy initiatives.

		Demographic and Population Change	Aging Workforce: Challenges and opportunities presented by an aging workforce. Workplace Diversity and Inclusion: Importance of diversity and inclusion in the TCLF sectors. Digital Skills Gap: Need for enhanced digital skills among the workforce. Changing Consumer Demographics: Adaptation to TCLF product requirements for an older population. Youth Employment Trends: Attractiveness of TCLF sectors to younger generations.
		Values & Identities	Youth Attraction to TCLF: Challenges in attracting young talent to technical positions in TCLF. STEM Graduates: Difficulty in attracting STEM graduates to the TCLF sectors. Incorporating Migrants: Integration of immigrants and refugees into the TCLF workforce. Second-Hand Market Growth: Impact of the expanding second-hand sector on traditional TCLF markets.
		A New Consumer	Demand for Personalization: Consumer preference for personalized TCLF products. Wellbeing and Lifestyle: Consumer focus on healthier lifestyles and its impact on product designs. Luxury Market Trends: Demand trends for high-end and luxury TCLF products.

			Online Retail Expansion: Impact of online sales growth on traditional TCLF retail models. Local Product Preference: Consumer preference for products with local or national branding. Price Sensitivity: Effect of price sensitivity on consumer choices in the TCLF sectors.
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6.2 Survey Responses

The cleaned version of the survey response table (Excel) is available at the following link:

[Survey results \(clean\).xlsx](#)

6.3 Focus Groups

The following document compiles the reports from the seven representative countries in the AEQUALIS4TCLF project, outlining the insights and conclusions drawn from each partner's focus groups.

[Focus Group Reports.pdf](#)