



ChemSkills

Enabling the green and digital skills
transformation of the chemical industry.

Report on ChemSkills Survey Results 1st iteration in the pharmaceutical sector

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1. Identification of respondents

This section provides an overview of the organisations which responded to the first *Future Skills Survey* of the [ChemSkills](#) project “Enabling the green and digital transformation of the chemical industry” (01 February 2024 – 27 October 2024) and which are relevant to the pharmaceutical sector.

Out of the 117 total responses received, 10 specifically relate to the pharmaceutical sector. Of these, 50% came from “Industry and SMEs”, 20% from “Social partners”, 10% from a “Public institution”, and 20% were categorised as “Others”, including “Public-private partnership” and “In silico Contract Research Organisation” (*Figure 1*). These findings are in line with the trends of the total of responses, which predominantly came from “Industry and SMEs”.

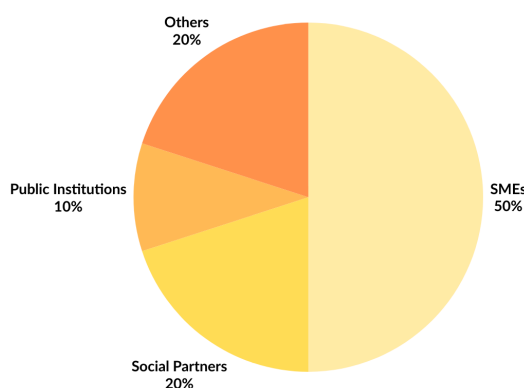


Figure 1 – Type of pharmaceutical organisation

Regarding company size, 40% of pharmaceutical respondents represented large companies (250+ employees), 20% medium-sized companies (50-249 employees), 20% small companies (10-49 employees), and 20% micro-enterprises (1-9 employees) (*Figure 2*). This trend is reflected in the overall dataset, where nearly 60% of respondents represented large enterprises.

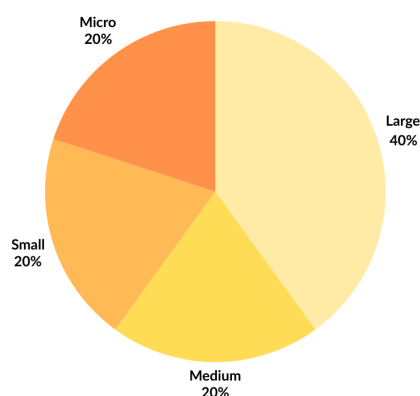


Figure 2 – Company size of respondents

These organisations operate across a wide range of countries, both in the and outside the EU, as for example Australia, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the

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Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden and several non-European countries, such as Belarus, Kazakhstan, Russia, Serbia, the UK, Ukraine, the USA. This diverse geographical scope reflects the global reach of large and medium-sized companies, often operating in multiple countries.

2. Sectoral Needs to Meet Green & Digital Transition

In line with the overall survey results, “Sustainability and circular economy” and “Increased adoption of digital technologies” emerged as the primary trends and drivers influencing pharmaceutical organisations. These are followed by “Regulatory changes impacting industry practices” and the “Shift toward automation and robotics” (*Figure 3*).

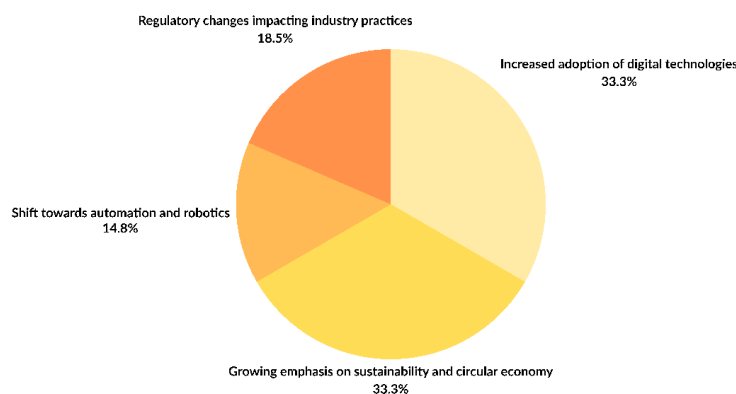


Figure 3 – Current trends/needs in the market

Notably, 50% of pharmaceutical respondents strongly agree that “*their department/organisation/sector will be likely affected by the upcoming changes in the market transition towards the green economy*”. Similarly, 40% of respondents strongly agree with this statement concerning the transition towards the digital economy.

This discrepancy becomes even more evident in the overall survey results, where more than 60% strongly agreed that their department, organisation or sector would be impacted by the green economy, whereas only 27% expressed the same regarding the digital economy.

Given the limited number of responses from the pharmaceutical sector, it is quite challenging to develop recommendations that would reflect the entire sector. However, a preliminary consideration would be to increase investments in re-/up-skilling the workforce with green competencies to better prepare the industry for the ongoing market transition.

2.1. Sector competencies needed in pharmaceuticals

This section explores the competencies which emerged to be needed in the pharmaceutical sector, according to the survey results. Respondents were asked to rate various competencies in terms of their importance for the sector, on a scale from 1 (least important) to 5 (most important). The competencies were categorised as sectoral, digital, soft and green.

2.1.1. Sectoral

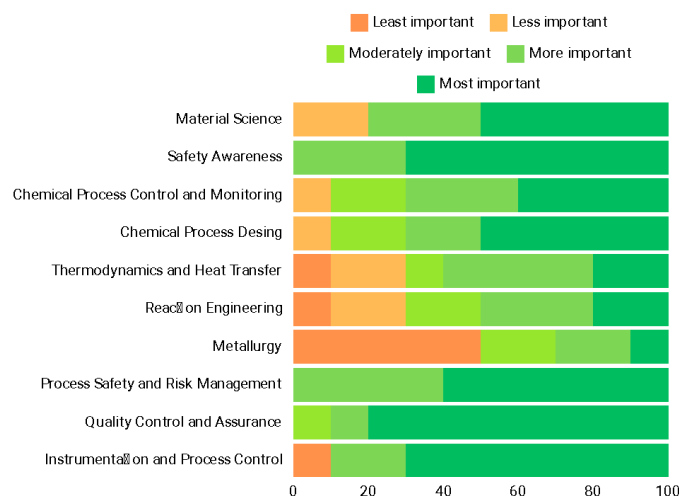


Figure 4 – Sector-specific competencies needed in the market

The majority of respondents rated the above-listed sectoral competencies as either “most important” or “more important”, with particular emphasis on “safety awareness”, “process safety and risk management”, “quality control and assurance” and “instrumentation and process control”. These competencies reflect the critical importance of ensuring the safety, efficiency and quality of pharmaceutical processes (Figure 4).

On the contrary, “metallurgy” was rated as the least important competency, with limited demand for this skill within the industry.

Additionally, certain responses highlighted “electrochemistry” and “regulatory conformity for dossier completeness” as important competencies for the pharmaceutical sector that should be further explored.

2.1.2. Digital

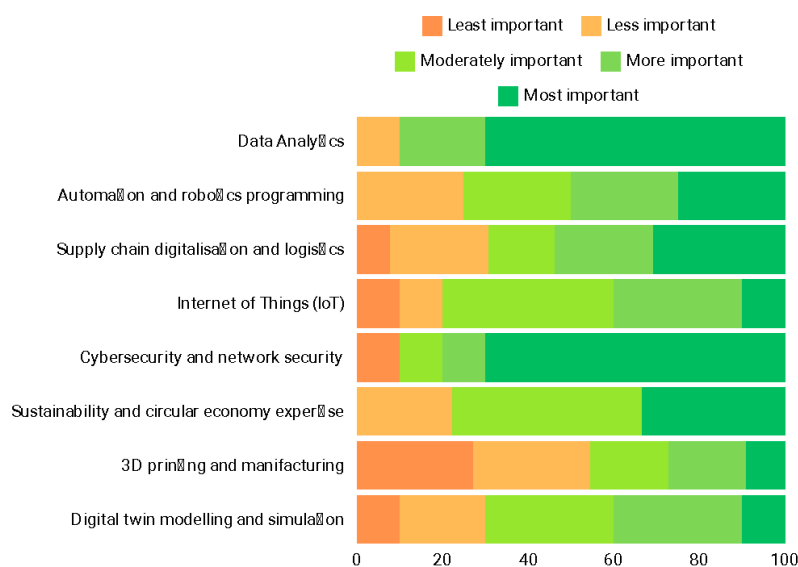


Figure 5 – Digital competencies needed in the market

As a matter of fact, “data analytics” and “cybersecurity and network security” emerged as the two most in-demand digital competencies according to the survey respondents. These were followed by “automation and robotics programming”, “supply chain digitalisation and logistics”, “Internet of Things” and “digital twin modelling and simulation”. On the other hand, “3D printing and manufacturing” technologies were not considered relevant for the pharmaceutical sector (Figure 5). Respondents also highlighted the growing significance of Artificial intelligence (AI) and its programming applications, as well as the modelling of experimental data related to health, safety and environment within a regulatory context.

2.1.3. Soft

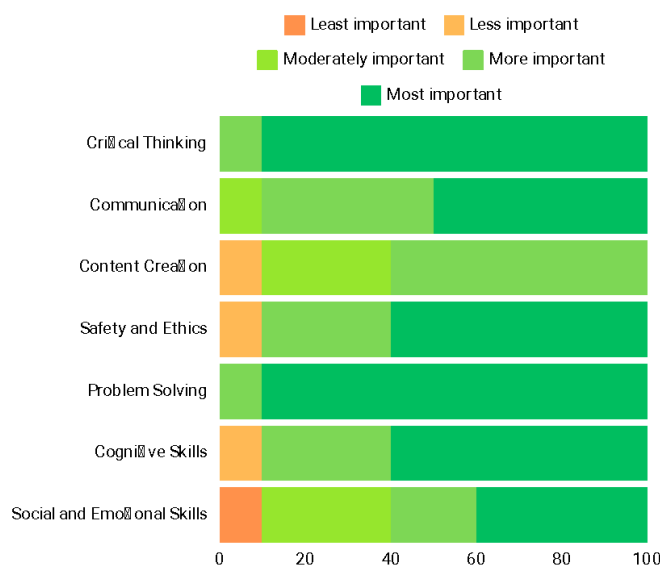


Figure 6 – Soft competencies needed in the market

An interesting observation is that soft competencies were generally regarded as highly relevant not only for the pharmaceutical sector, but also for other subsectors covered by the survey. In fact, the overall appreciation of these skills was even greater than that for sectoral, green and digital competencies. This confirms the value that pharmaceutical organisations place on attributes such as critical thinking, communication, safety and ethics, problem-solving, cognitive skills, content creation and social and emotional skills, alongside technical expertise (Figure 6). In addition to these competencies, respondents also highlighted the importance of flexibility, agility, and long lifelong learning as equally essential soft skills.

2.1.4. Green

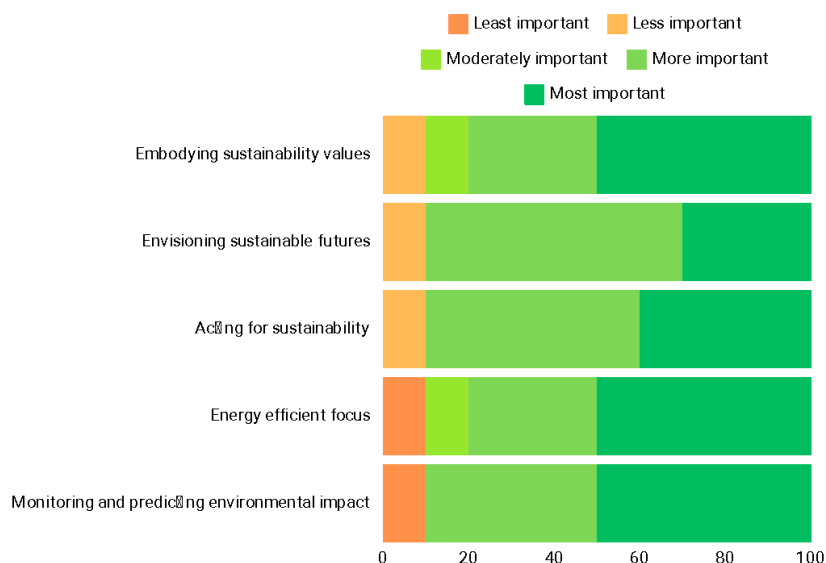


Figure 7 – Green competencies needed in the market

Similarly, green skills are also in high demand within the pharmaceutical sector. Respondents place significant value on competencies related to “embodying sustainability values”, “envisioning sustainable futures”, “acting for sustainability”, “energy efficiency”, and “monitoring and predicting environmental impact” (Figure 7). Additionally, it was emphasised by some respondents the importance of “Safe-and-Sustainable by Design” (SSbD), confirming their growing relevance in the sector.

2.2. Workforce needed in the pharmaceutical sector

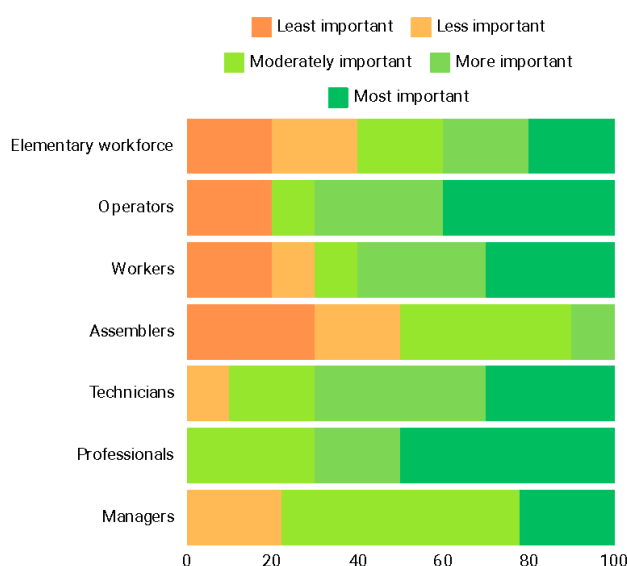


Figure 8 – Workforce composition – Currently needed (1-2 years)

When considering the workforce composition required in the pharmaceutical sector over the next 1-2 years, there is a clear demand for “professionals”, defined as individuals able to

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expand existing knowledge, apply scientific or artistic concepts and theories, teach in a systematic manner, or engage in any combination of these activities. Following this, the sector also requires “technicians”, “operators”, “workers”, “managers”, “elementary workforce”¹ and, finally, “assemblers”, with the latter profession receiving a relatively low number of responses (*Figure 8*).

Additionally, only one respondent highlighted the need for scientists.



Figure 9 – Workforce composition – Needed in the future (5-10 years)

The results of the future needed workforce (5-10 years) align with those of the previous chart, confirming that the trends observed earlier are also reflected in the long term (*Figure 9*). This indicated that changes within the pharmaceutical sector are gradual, with the demand for specific roles remaining consistent over time.

¹ This job role involves simple and routine tasks which may require the use of hand-held tools and considerable physical effort.

3. Training needs in the transition in the pharmaceutical sector

Regarding the availability of training programmes, 60% of respondents reported that their organisation/department is already offering courses for the industry transition, 10% indicated that this is planned by their company, while 30% stated that there are no immediate plans to implement such training courses.

For those already providing training, the topics covered include “bio-based economy”, “electrochemistry”, the use of NAMs (New Approach Methodologies) for the green transition, “implementation of ISO 14001”, “GHG” (Greenhouse Gas) and “ESG” (Environmental, Social and Governance) principles, and mandatory sustainability-related workshops for apprenticeships.

The survey also assessed the amount of time allocated for personal learning and development within organisations. The findings showed that in three cases, employees are allocated more than 80 hours per person per year for training, in two cases between 20 to 80 hours, in two cases less than 20 hours and in three cases, respondents could not provide a specific answer.

A final question exploring the average monetary investment in learning and development did not reveal any clear trends, as most respondents were unaware of the current investment in their organisation. However, those who provided an answer generally indicated that it was relatively low.

4. Generation and Gender Gaps

When analysing the results of the final questions and exploring the generational and gender gaps, nearly all respondents agreed that there are some generational gaps in digital skills among employees in their organisation. Specifically, 40% of respondents indicated that this gap is quite significant, 50% that the gap exists but is not minor, 10% that is not noticeable and 10% of responses were left blank. However, 90% stated that this digital gap is not related to a gender difference.

One additional comment highlighted an important point regarding the definition of digital skills: it is necessary to differentiate between “programming skills”, which are connected to hard skills, and “application skills”, which are non-technical skills used in everyday tasks – i.e. proficiency with Microsoft Office tools.

In conclusion, the pharmaceutical sector faces a digital skills gap, but this gap is primarily generational rather than gender-based.