



D3.2 -PORTFOLIO OF CORE DIGITAL SKILLS IN KEY CAPACITY AREAS

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Introduction

This report, titled "Portfolio of Core Digital Skills in Key Capacity Areas," is the deliverable D3.2 under Work Package 3 (WP3) – "State of the art analysis of labour market skills for digital transition."

The document explores the significance of digital skills in the development of companies, particularly in SMEs. Through national online surveys conducted in countries like Cyprus, Finland, Germany, Greece, Poland, Hungary, and Italy, the report delves into the specific digital skills lacking among employees and coworkers and the reasons behind the observed digital skills gap.

Key areas such as Cybersecurity, Advanced Excel, Social Media Marketing and Analytics, Data Analytics, Artificial Intelligence (AI), and Machine Learning (ML) emerge as prominent skill gaps. The report also identifies the most important digital platforms and programming languages that should be included in training courses, such as Microsoft Office Suite, Microsoft Power BI, Zoom/Teams, G-Suite, and Salesforce.

The introduction sets the stage for a comprehensive analysis of the core digital skills deemed crucial for the development of companies in the digital age. It provides valuable insights that guide the development of relevant courses in this project, shedding light on the digital skills essential for business owners, managers, and employees across various disciplines.

The findings from this report will serve as a foundation for targeted training and development initiatives, ensuring that individuals and organizations are well-prepared to navigate the ever-changing digital world.

State of the art analysis per partner country

Cyprus

The national survey conducted in Cyprus aimed to understand the significance of digital skills in the development of companies in Cypriot SMEs.

The survey delved into the specific digital skills lacking among employees/coworkers and the reasons behind the observed digital skills gap. Cybersecurity emerged as the most prominent skill gap, with 37 respondents identifying it as a key area for improvement. Advanced knowledge in Excel, social media marketing and analytics, and data analytics were also high on the list, each receiving 32 answers. Artificial intelligence and machine learning followed closely, with 31 responses. This information shed light on the digital skills deemed essential by business owners, managers, and employees across various disciplines, guiding the development of relevant courses in this project.

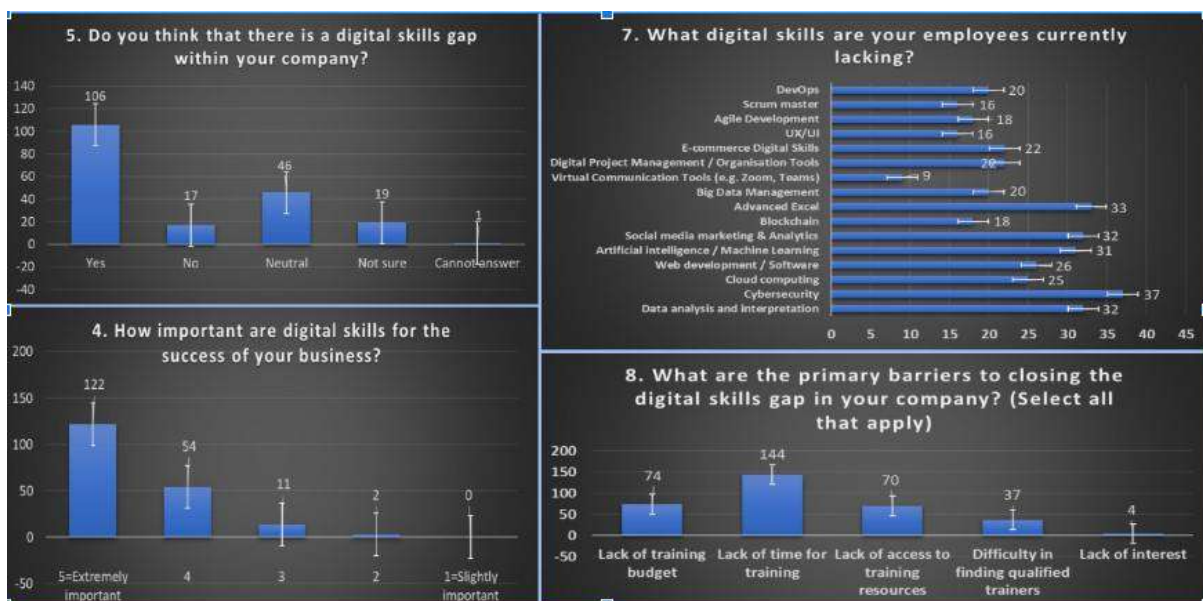


Figure 1 – Large – Survey Data from Cyprus

In the last section of the survey, participants were asked to identify the most important digital platforms and programming languages that should be included in a training course. Microsoft Office Suite was the most popular response, with 132 participants suggesting it as a critical platform for employees/coworkers to learn. Other notable choices included Microsoft Power BI (72 responses), Zoom/Teams (70 responses), G-Suite and Salesforce (67 and 60 responses, respectively), Mailchimp, GitHub, and Figma (53 responses each). Project management tools like Jira, Trello, or Asana were deemed significant by 52 respondents, while Dropbox was highlighted by 51 participants.

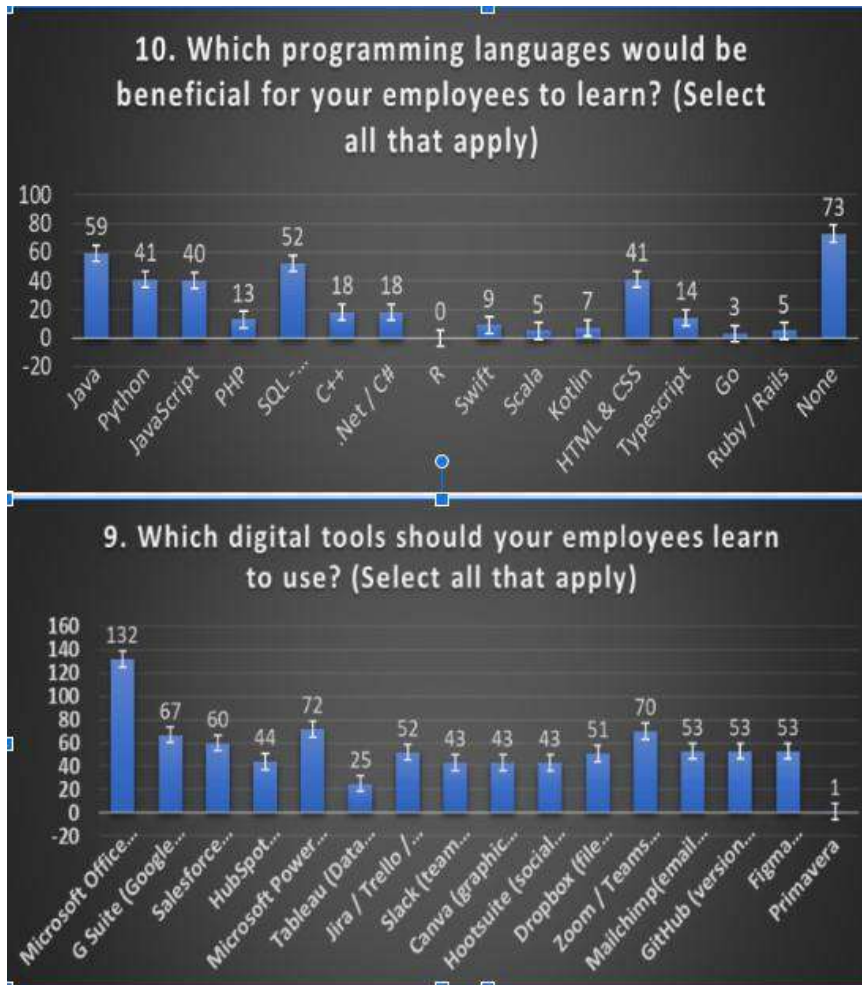


Figure 2 – Large – Survey Data from Cyprus

Interestingly, a substantial percentage of respondents (73 out of 192, 40%) indicated that programming languages were not deemed significant for their employees/coworkers, choosing the option "None." However, for those who recognized the importance of programming languages, Java emerged as the most popular choice with 59 responses. SQL followed closely with 52 responses, and Python, HTML & CSS, and JavaScript received 41 and 40 responses, respectively.

In conclusion, the national survey in Cyprus provided valuable insights into the core digital skills deemed crucial for the development of companies.

Finland

One of the key insights from the survey was the presence of significant expertise gaps in the domains of artificial intelligence, data analytics, and cybersecurity. This highlights the pressing need for upskilling and reskilling in these critical areas to ensure that businesses stay competitive and resilient in the digital age.



Figure 3 – Lack of digital skills in Finland

In addition to identifying the expertise gaps, the survey sought to determine the most effective training methods preferred by the participants. The results indicated that mentoring, learning on the job, and time-bound remote training were considered the most effective methods. These findings suggest that hands-on, practical approaches to learning are highly valued by employees, enabling them to acquire new skills while simultaneously contributing to their work responsibilities.

Another important aspect of the survey was to ascertain the digital skills that employees should prioritize in their learning journeys. The survey revealed that foundational skills, such as proficiency in Microsoft Office and familiarity with video conferencing services like Teams and Zoom, were deemed most necessary. This emphasizes the significance of building a strong foundation in essential digital skills before delving into more advanced and intelligent technologies.



Figure 4 – Popular and necessary digital tools in Finland

The survey's findings support the notion that employees should possess a solid grasp of basic digital skills, as they form the backbone of effective and efficient work practices. Once these foundational skills are established, employees can then progress to more advanced digital competencies, such as artificial intelligence, data analytics, and cybersecurity, to address the expertise gaps identified in the survey.

Germany

The survey conducted in Germany, highlighted that employees need a diverse set of digital skills rather than just being acquainted with a single technological skill. Respondents identified Data Analysis & Interpretation, AI, and Cybersecurity as the most crucial areas for improvement. This suggests that businesses recognize the value of a well-rounded skill set in navigating the complexities of the digital world.

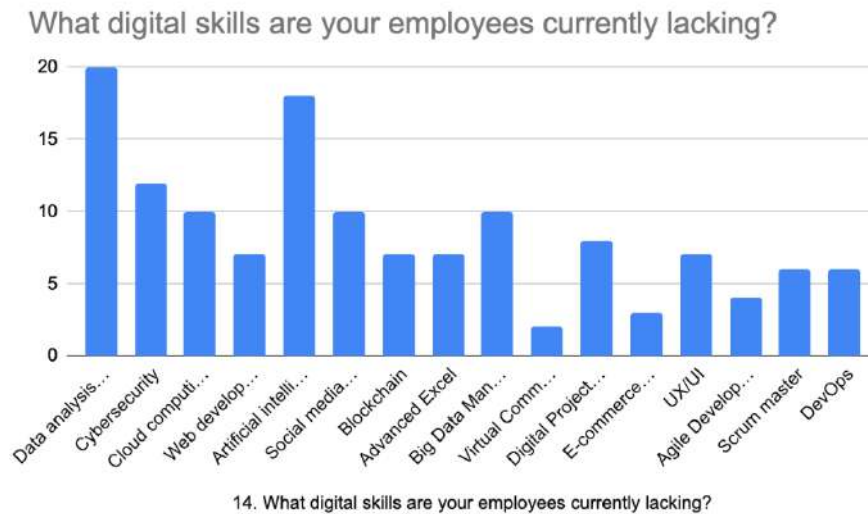


Figure 5 – Lack of digital skills in Germany

Regarding programming languages, Python, Java, JavaScript, and SQL were seen as the most important by the respondents. This finding indicates the relevance of these languages in various aspects of business operations and data handling. Notably, over 90% of respondents indicated that they consider learning more than one programming language beneficial for their employees, underlining the importance of versatility in programming skills.

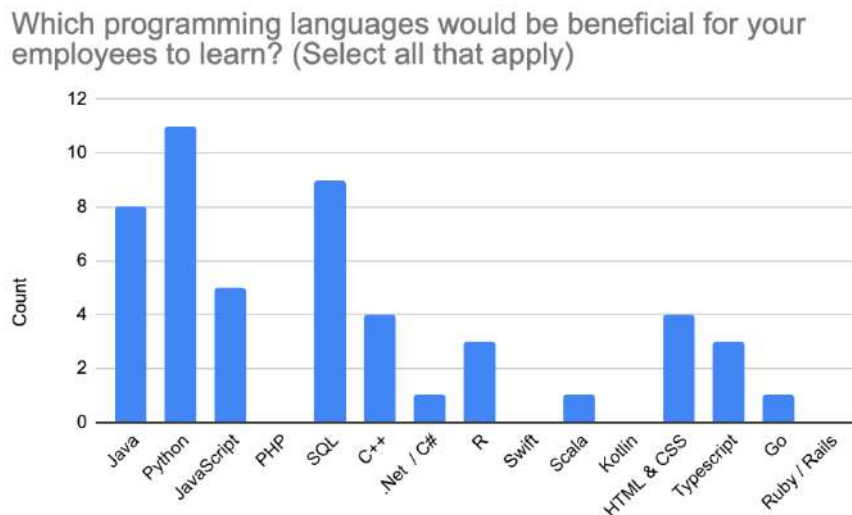


Figure 6 – Demand for Programming languages in Germany

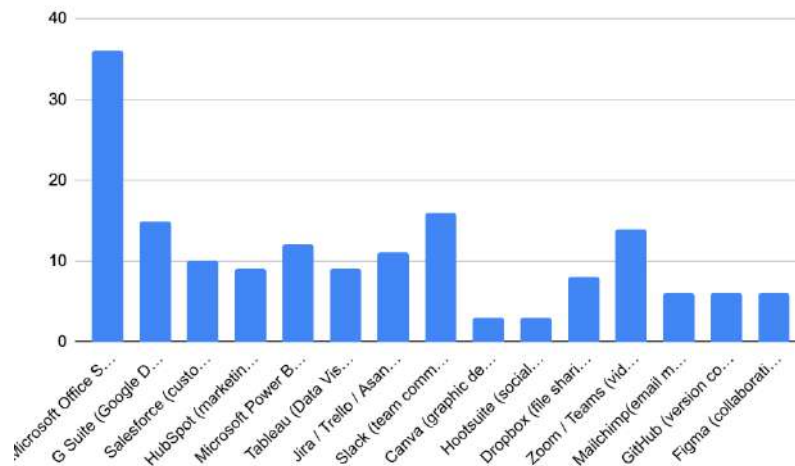


Figure 7 – Demand for Digital Tool in Germany

Furthermore, the survey revealed that over 90% of respondents recognized the importance of using multiple digital tools for their employees. Microsoft Office Suite emerged as the most critical tool, with 95% of respondents choosing it. Slack, Zoom/Teams, G Suite, and Microsoft Power BI were also deemed important for efficient business operations.

Greece

From the national survey conducted in Greece, participants were asked to identify the most crucial digital skills for their businesses. The results shed light on the core digital competencies that are in high demand among employers and managers.

Topping the list of essential digital skills is Advanced Excel, recognized by a significant 41.9% of respondents as crucial for their business operations. Close behind, at 41.9%, were Data Analysis and

Interpretation, emphasizing the importance of effectively utilizing data in decision-making processes.

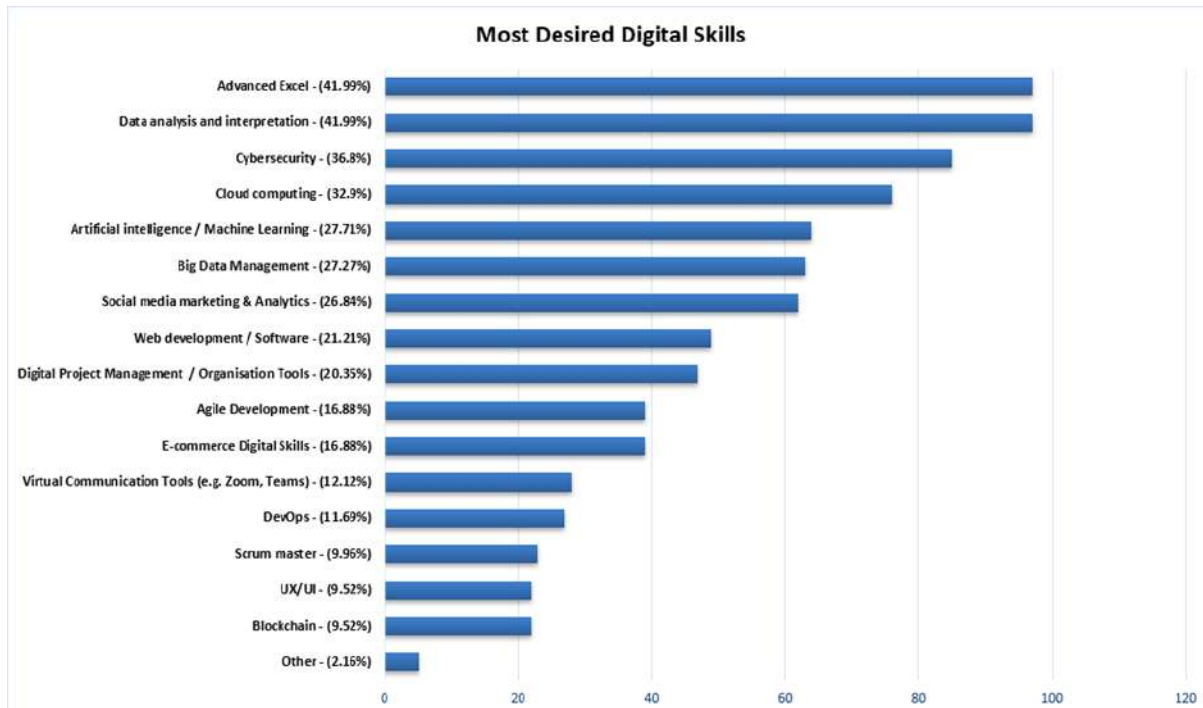


Figure 8 – Most Desired Digital Skills

Cybersecurity also emerged as a vital concern, with 36.8% of participants acknowledging its significance in protecting their digital assets.

Cloud Computing followed closely behind with 32.9%, underlining the growing popularity of cloud-based solutions for various business needs. Artificial Intelligence and Machine Learning, Social Media Marketing and Analytics, and Big Data Management are also highly sought-after skills for businesses, garnering percentages of 27.7%, 27.7%, 26.8%, and 21.2%, respectively.

Certain skills, while not as widely demanded, still hold importance in specific contexts. Agile Development, Digital Project Management, E-commerce, DevOps, Scrum Master, Virtual Communication Tools, Blockchain, and UX/UI all received less than 21% recognition. However, they remain relevant for businesses seeking specialization in these areas.

In terms of programming languages, Python stands out as the clear leader with 45% of respondents acknowledging its significance. Known for its versatility and simplicity, Python finds applications in various domains. SQL, a language vital for database management, received substantial support with 41.4% of participants recognizing its importance. JavaScript, essential for web development and

interactive user experiences, was identified by 34.2% of respondents. HTML and CSS, fundamental for structuring and styling web content, were deemed beneficial by 31.1% of participants.

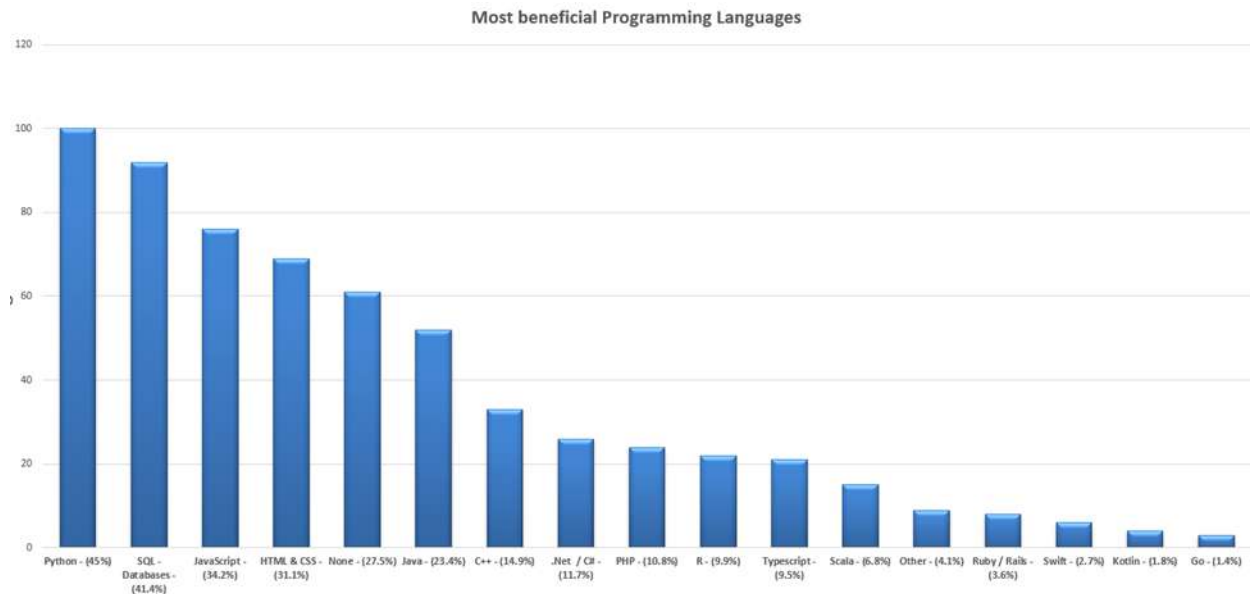


Figure 9 – Most Beneficial Programming Languages in Greece

Surprisingly, 27.5% of respondents expressed that no programming languages were needed for their employees' roles in their businesses. This could indicate either a lack of understanding of the potential benefits of programming languages or that certain businesses indeed do not require such skills for their day-to-day operations.

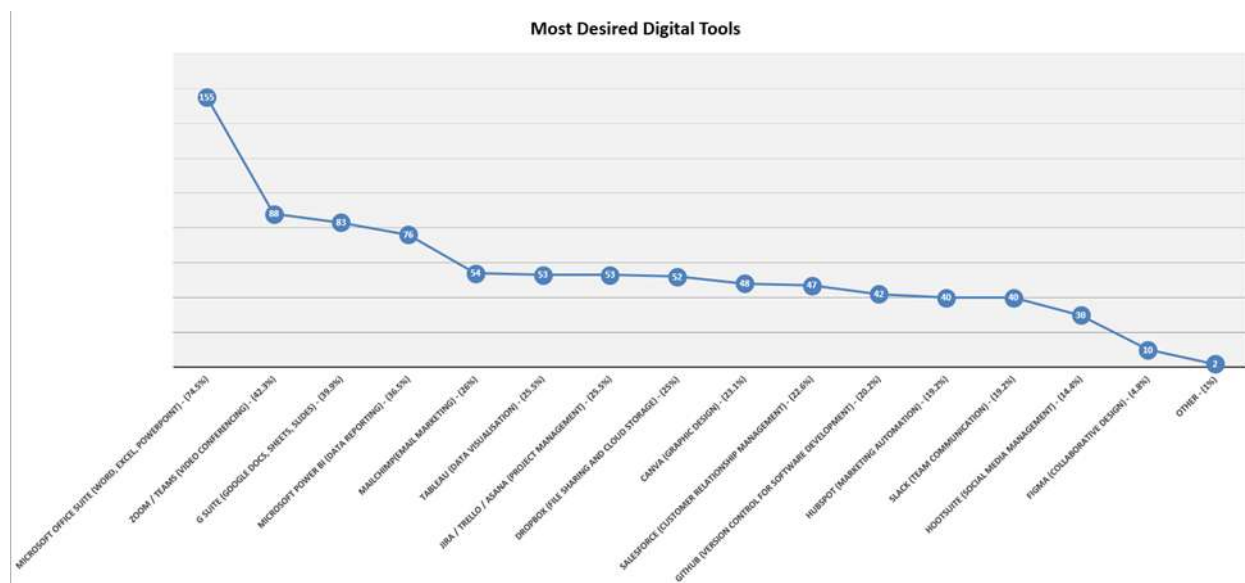


Figure 10 – Most desired Digital Tools in Greece

When it comes to digital tools, Microsoft Office Suite proved to be the most popular, with a significant 74.5% of employers and managers endorsing its use among their employees. Zoom and Teams, essential for virtual communication, followed closely at 42.3%. Gsuite, encompassing various Google productivity tools, was recognized by 39.9% of participants. Microsoft Power BI, enabling data visualization and analysis, was valued by 36.5% of respondents. Mailchimp, a popular email marketing platform, obtained recognition from 26% of participants, while Tableau, another data visualization tool, garnered support from 25.5%.

Overall, the survey highlights the growing importance of digital skills in the Greek business landscape. Advanced Excel, Data Analysis, and Cybersecurity are among the most sought-after skills, while programming languages like Python, SQL, and JavaScript are essential for various roles. Furthermore, digital tools like Microsoft Office Suite, Zoom, and Gsuite are widely utilized in businesses to enhance productivity and communication.

Poland

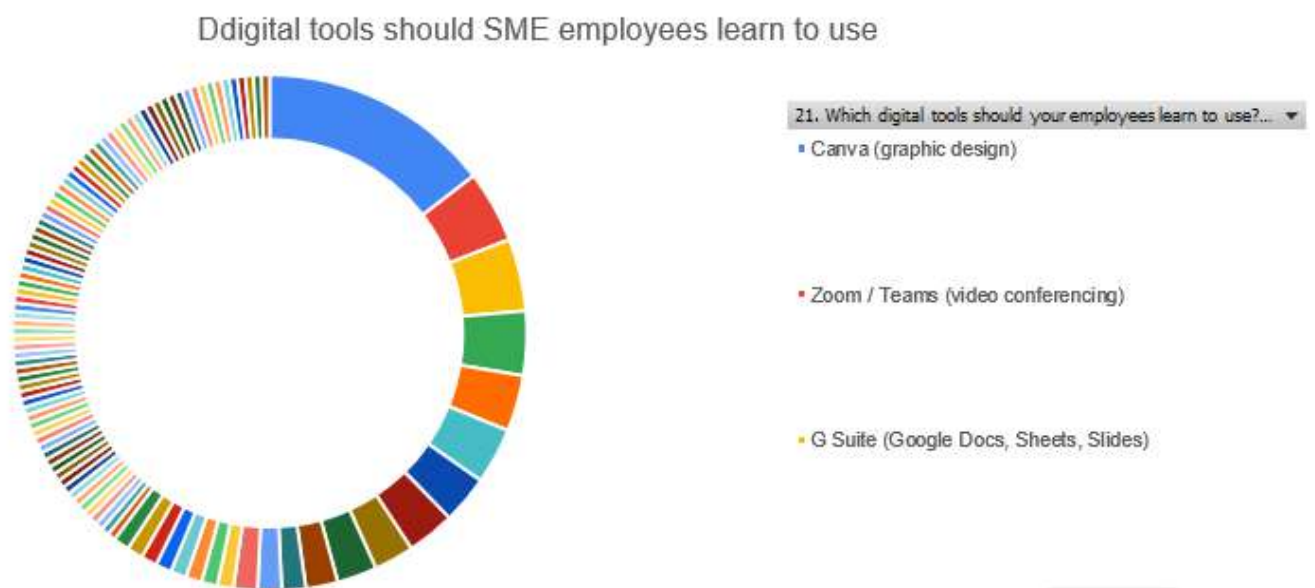


Figure 11 – Necessary Digital Tools for SME employees

The Polish Survey highlighted the importance of Sales and Marketing functions in Polish companies and their potential impact on digitalization efforts.

Regarding digital tools, the survey showed that certain tools were more popular among respondents. Canva emerged as the most popular digital tool, with over 63 companies using it for their graphic design needs. Zoom/Teams, which are video conferencing and collaboration platforms, were adopted by over 20 companies, indicating the growing importance of remote work and virtual communication

in the digital landscape. Gsuite, encompassing various Google productivity tools, was also used by over 20 companies.

On the other hand, some digital tools were less popular among respondents. Microsoft Office Suite, which includes Word, Excel, and PowerPoint, was chosen by only a few companies. Similarly, project management tools like Jira, Trello, and Asana, team communication platform Slack, and version control tool GitHub were not widely adopted by the surveyed companies.

Hungary

For Hungary, employees at the respondents' organization are seen to be weak in digital abilities in a number of areas. Advanced Excel skills, artificial intelligence, social media marketing, and data analysis appear to be particularly important areas where improvement is required.



Figure 12 – Lack of Digital skills in Hungary

In Hungary, the survey results indicate that Java, Python, and SQL - Databases are considered the most beneficial programming languages to acquire. Additionally, JavaScript and HTML & CSS have garnered substantial interest among respondents. It's vital to recognize that these preferences for programming languages might differ, reflecting the unique requirements of individual companies and the specific nature of their projects. Interestingly, a high number of respondents selected "None," which could

imply that not all participants in the survey perceive a necessity to learn programming languages. This response might also suggest that their particular roles within their companies do not demand specialized programming skills.

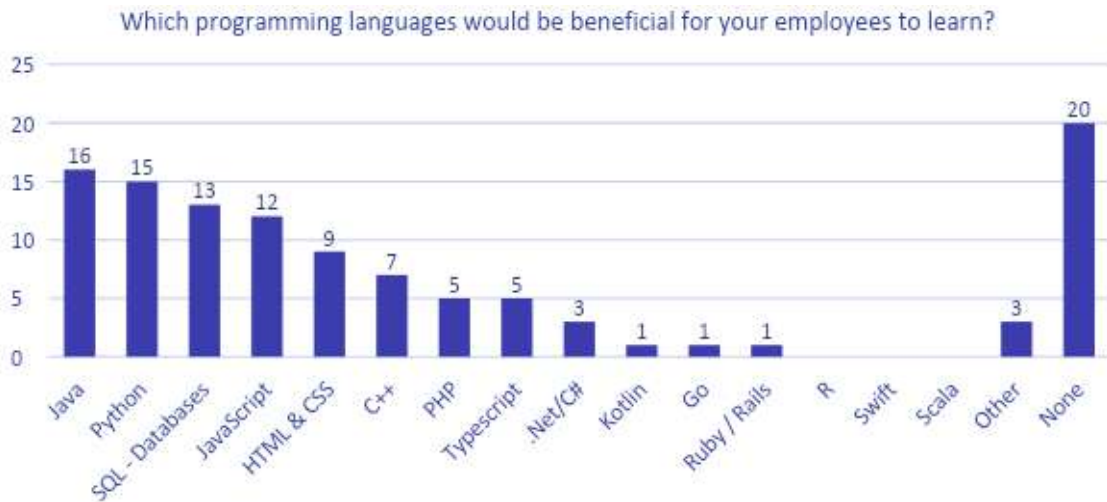


Figure 13 – Beneficial Programming Languages in Hungary



Figure 14 – Necessary Digital skills in Hungary

The survey results reveal that Microsoft Office Suite holds the top position as the most favored tool among respondents. It is closely followed by project management tools such as Jira, Trello, and Asana, and customer relationship management software like Salesforce. Other tools that were acknowledged for their importance include G Suite, Microsoft Power BI, and Canva. In the "Other" category, respondents mentioned additional digital tools that were not listed but deemed significant, including Intercom, Confluence, Gitlab, Miro, and AI tools like Midjourney and ChatGPT. The variety of tools cited in this category underscores the extensive array of digital tools that are pertinent to different industries and professional roles

Italy

For Italy, the most selected digital competences needed by employees in SMEs were cybersecurity, social media marketing, and analytics, chosen by 42.9% of respondents. Web development and software skills were also in high demand, with 40.5% of participants recognizing their importance. Advanced Excel followed closely, garnering 38.1% of the vote. Digital project management, organization tools, and big data management were seen as crucial skills by 35.7% of respondents. Artificial intelligence, machine learning, and e-commerce digital skills were valued by 33.3% of participants. Cloud computing and DevOps were selected by 26.2% of respondents, while skills in blockchain, UX/UI, agile development, and Scrum master were identified as essential by 23.8% of participants. Data analysis and interpretation received 21.4% of the vote, and virtual communication tools (e.g., Zoom, Teams) were considered necessary by 16.7%.

14. Quali competenze digitali mancano attualmente ai vostri dipendenti? (è possibile selezionare più di una risposta)

42 risposte

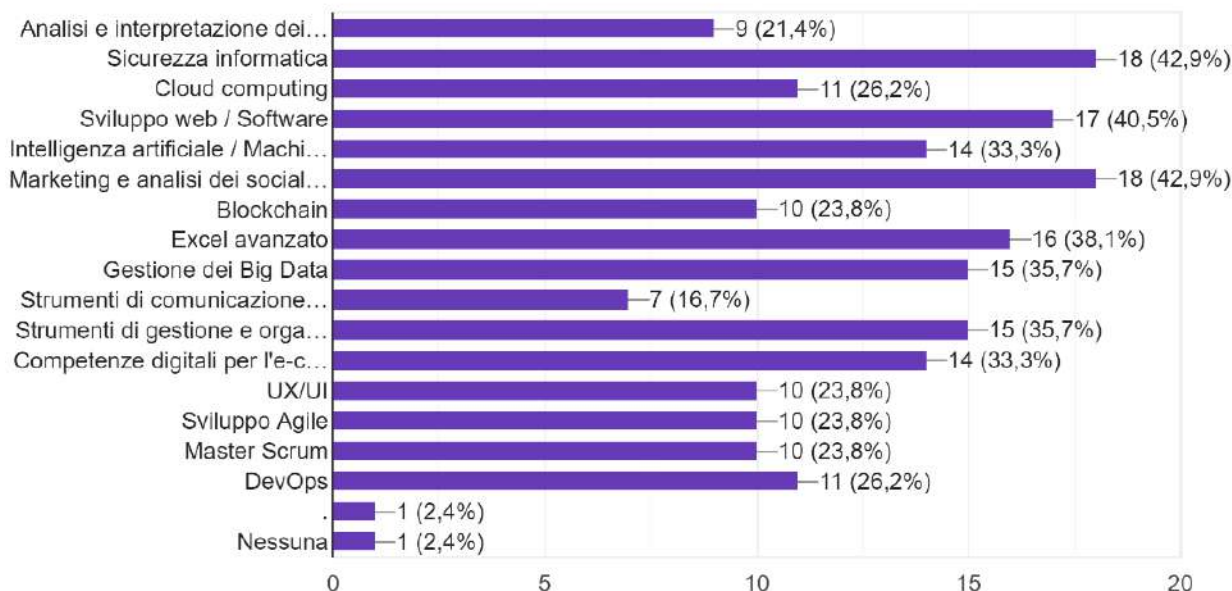


Figure 15 – Popular Digital competencies in Italy

The responses on programming languages also provided valuable insights. Java emerged as the most commonly suggested language, with 26.3% of respondents endorsing its importance. JavaScript followed closely behind with 21.1% of the vote. SQL, along with HTML and CSS, were seen as valuable languages by 15.8% of participants. Python, known for its versatility, received 7.9% of the vote. Other languages like PHP and C++ were suggested by 5.3% of respondents, while R, Scala, Swift, TypeScript, .Net/C# received 2.6%.

20. Quali linguaggi di programmazione sarebbe utile che i vostri dipendenti imparassero? (è possibile selezionare più di una risposta)

38 risposte

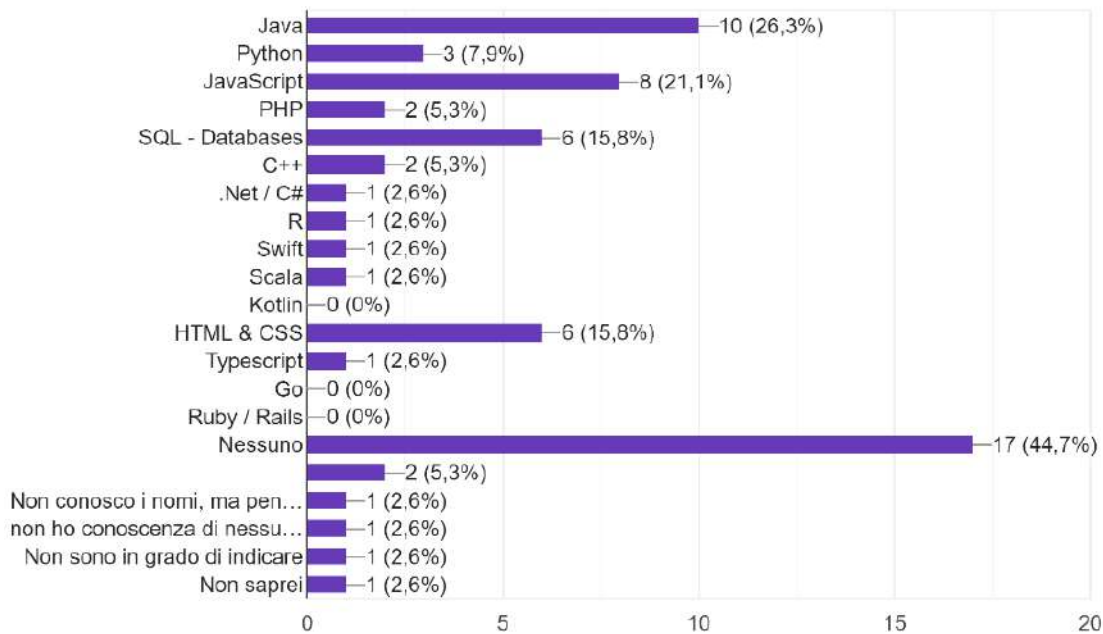


Figure 16 – Beneficial Programming Languages in Italy

In terms of digital tools, the responses were diverse, reflecting the various aspects of work in SMEs. Microsoft Office Suite (Word, Excel, PowerPoint) was the most popular choice, with 66.7% of participants recognizing its significance. Canva, a graphic design tool, was valued by 45.2% of respondents, while Mailchimp, a popular email marketing platform, received 33.3% of the vote. G Suite (Google Docs, Sheets, Slides) was endorsed by 28.6% of participants, and HubSpot received 26.2% support. Dropbox, Hootsuite, Zoom/Teams, and Microsoft Power BI were selected by 19% of respondents. Slack, a communication and collaboration tool, received 16.7% of the vote. Project management tools like Jira, Trello, and Asana, along with Figma (for design collaboration), were suggested by 11.9% of participants. Tableau, a data visualization tool, received 9.5% support, while GitHub, used for version control in software development, was chosen by 7.1% of respondents.

21. Quali strumenti digitali dovrebbero imparare a usare i vostri dipendenti? (è possibile selezionare più di una risposta)

42 risposte

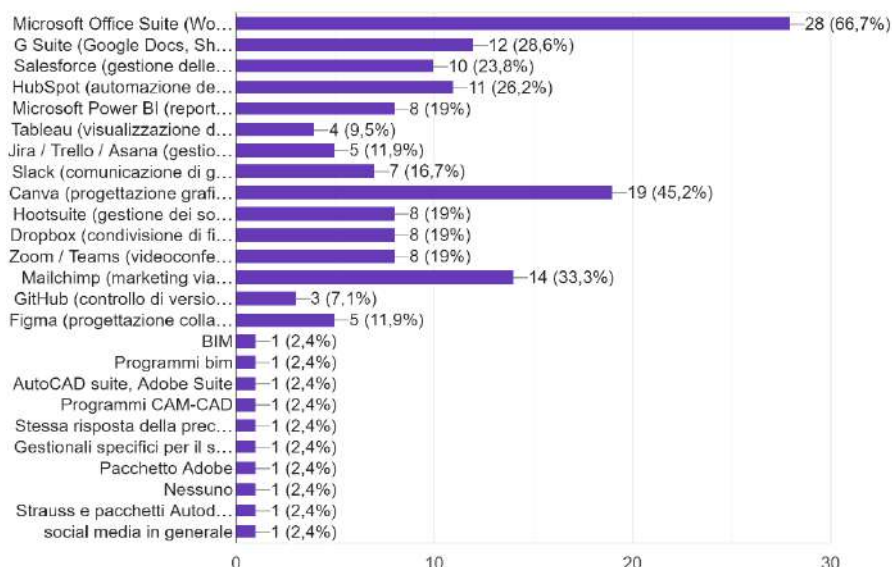


Figure 17 - Necessary Digital tools in Italy

Large Survey Analysis - Consolidated Data

The outcomes in Hungary, Italy, Germany, and Finland were akin to those in Greece, Poland, and Cyprus, indicating that the needs and viewpoints of companies across Europe appear to be relatively uniform.

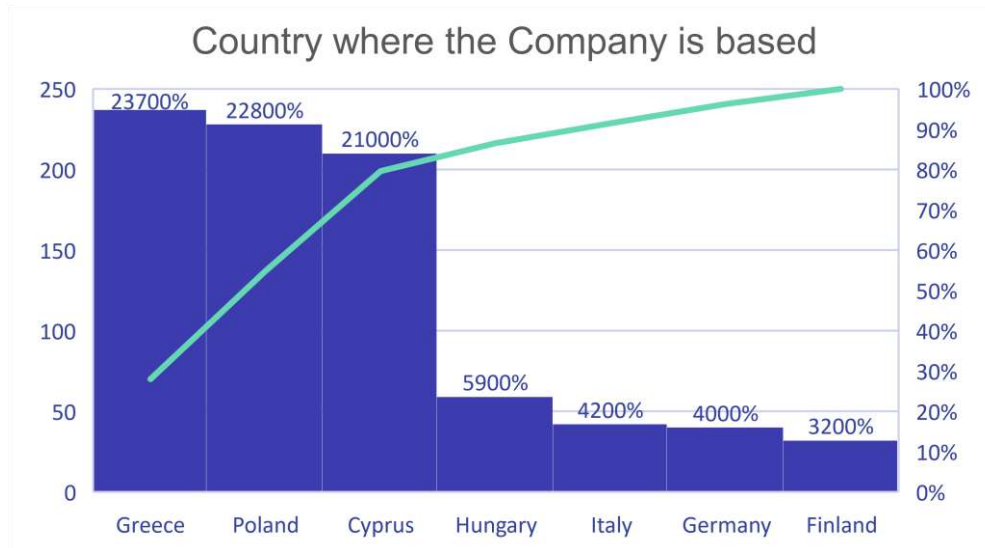
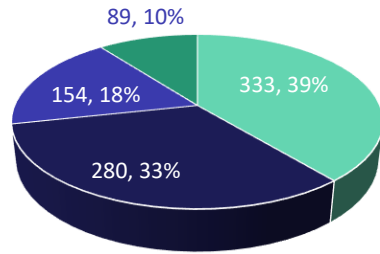


Figure 18 – Responses to the large survey per partner country

Micro, small and medium sized companies represent 90% of all respondents of the survey. Micro and small enterprises are overrepresented in terms of number, number of employees and value added related to EU statistics

Company Size



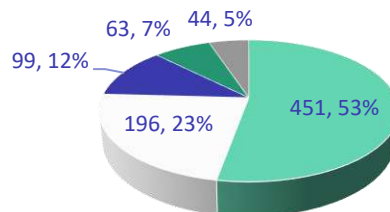
- Micro - 1 to 9 employees
- Small - 10 to 49 employees
- Medium-Sized - 49 to 250 employees
- Large - More than 250 employees

Figure 19 – Participating companies to the large survey

The Technology, Engineering, Manufacturing, and Construction industries were the most engaged respondents, a favorable outcome from a digitalization standpoint. These sectors are widely recognized as leading industries with significant potential to reap the benefits of digitalization.

More than half of the companies report gaps in digital skills. The respondents attribute this to a shortage of time and training budget, hindering the acquisition of new abilities.

Do you think that there is a digital skills gap within your company?



- Yes
- Neutral
- No
- Not sure
- Cannot answer

Figure 20 – Digital skills gap within a company

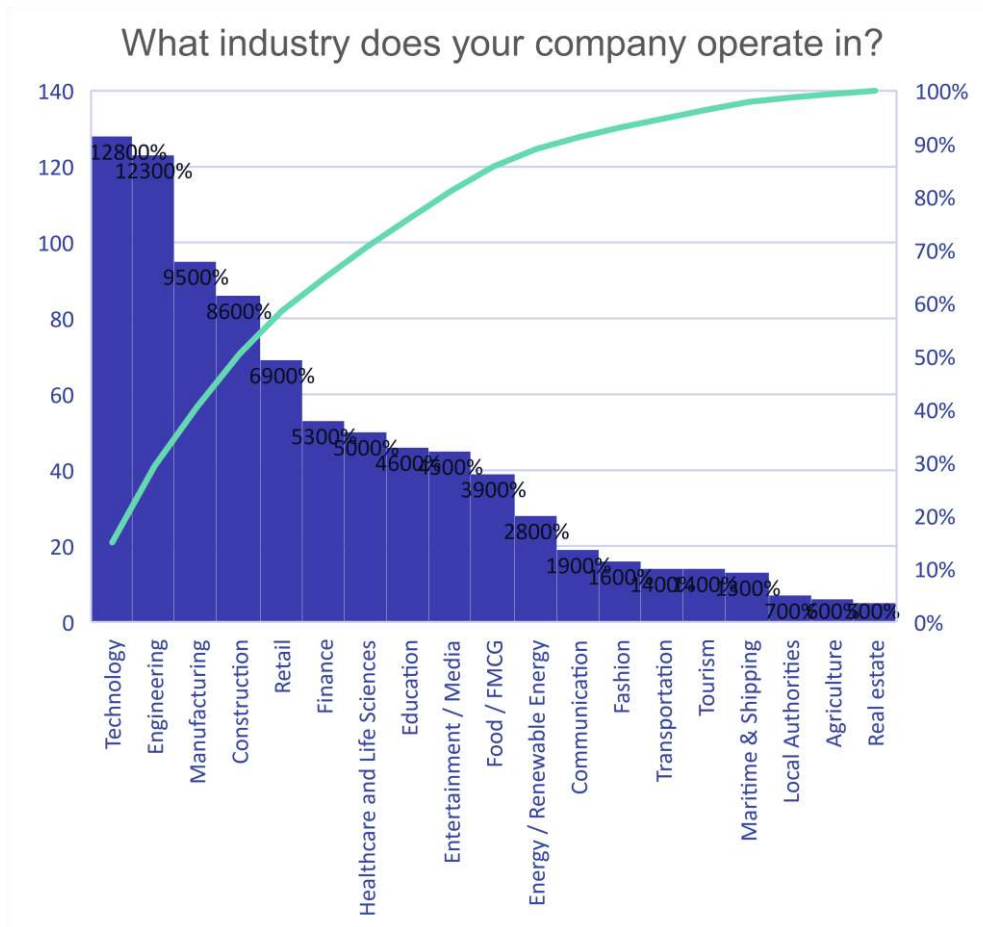


Figure 21 – Industry of participating companies

What are the primary barriers to closing the digital skills gap in your company?

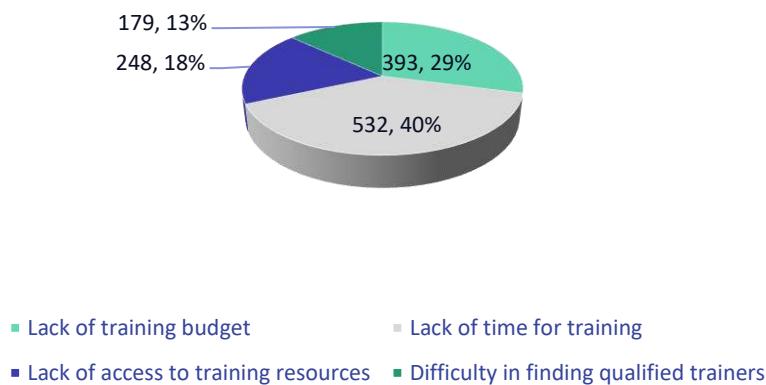


Figure 22 – Barriers within a company for closing digital skills gap

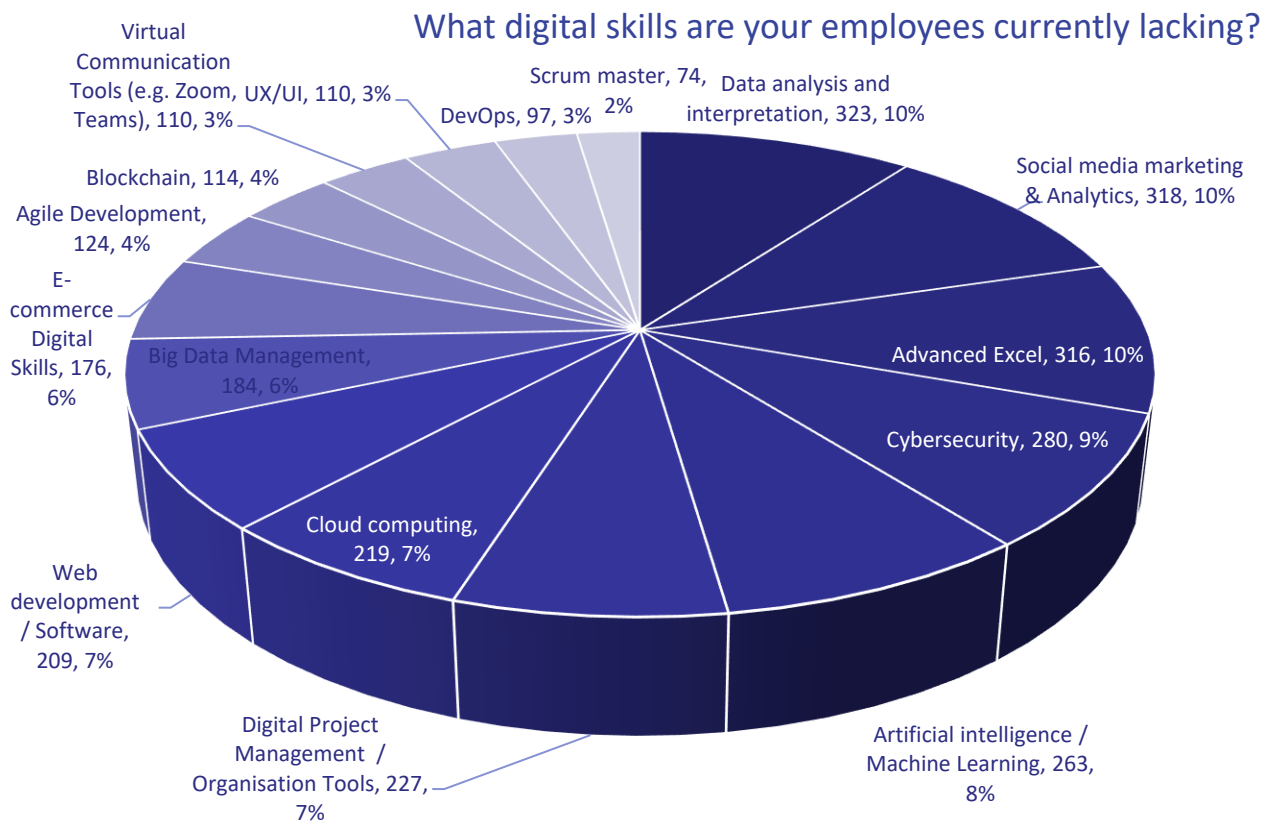


Figure 23 – Lack of Digital skills

- ✓ **Data Analysis and Interpretation, Cybersecurity, Social Media Marketing & Analytics, Blockchain, Big Data Management, UX/UI, Agile Development, Scrum Master, DevOps:** These competencies are vital across multiple departments for extracting data insights, safeguarding cybersecurity, executing effective marketing strategies, employing blockchain technology, handling big data, improving user experience, and embracing agile development practices. Particularly, understanding blockchain is crucial for sectors investigating its diverse applications.
- ✓ **Project Management Tools:** Mastery in digital tools for project management is indispensable across various departments to streamline project workflows.
- ✓ **Advanced Excel, Virtual Communication Tools (e.g., Zoom, Teams):** Skillfulness in advanced Excel functions and virtual communication platforms is essential for in-depth data analysis and efficient team collaboration.
- ✓ **Web/Software Development, Digital Marketing, E-commerce Skills:** Specific departments such as web/software development, digital marketing, and e-commerce necessitate professionals proficient in website creation, software development, digital marketing techniques, and e-commerce protocols.
- ✓ **Cloud Computing:** The ability to adeptly manage and utilize cloud-based resources is a sought-after skill, reflecting the growing reliance on cloud computing.
- ✓ **Artificial Intelligence/Machine Learning (AI/ML):** Departments aiming to incorporate AI and ML technologies are on the lookout for employees with specialized knowledge in these fields.

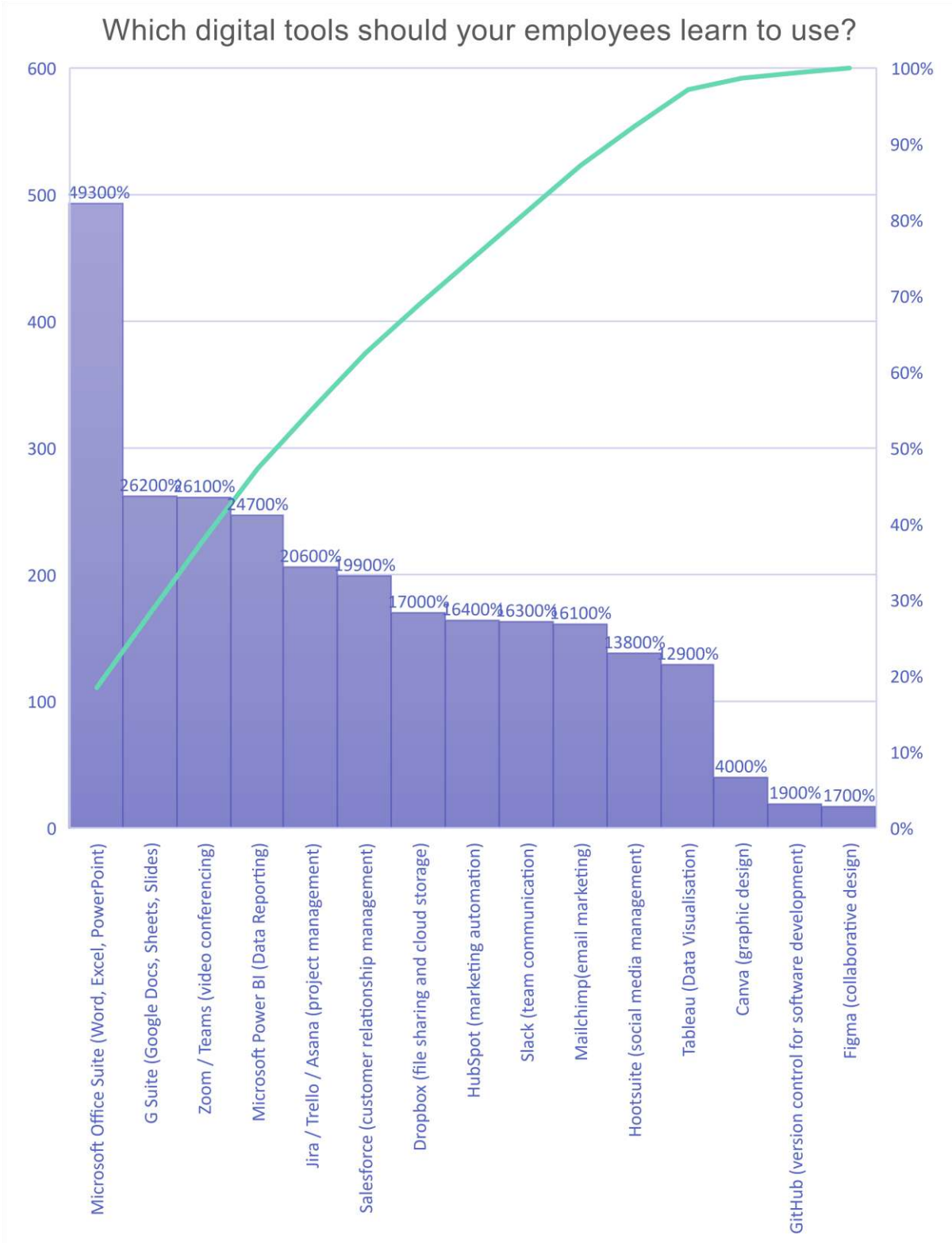


Figure 24 – Necessary Digital Tools

Among employers and managers, the digital tools that have gained the most popularity for employee use include Microsoft Office Suite (493 users), Gsuite (262 users), Zoom/Teams (261 users), Microsoft Power BI (247 users), and Jira/Trello/Asana (296 users).

These findings emphasize the necessity for employees in SMEs to become proficient in a diverse array of digital tools to carry out their responsibilities efficiently. Microsoft Office Suite and Gsuite stand out as favored office suites, offering multifaceted tools for crafting documents, spreadsheets, and slideshows. For remote collaboration and meetings, Zoom and Teams have emerged as the go-to video conferencing solutions. Microsoft Power BI, known for its robust data visualization and analysis capabilities, aids businesses in gaining deeper insights into their operations. Additionally, Jira, Trello, and Asana are widely used project management platforms that contribute to effective project oversight and execution.

The survey results underscore the evolving digital landscape and the importance of versatile digital skill sets in enhancing productivity and collaboration within SMEs.

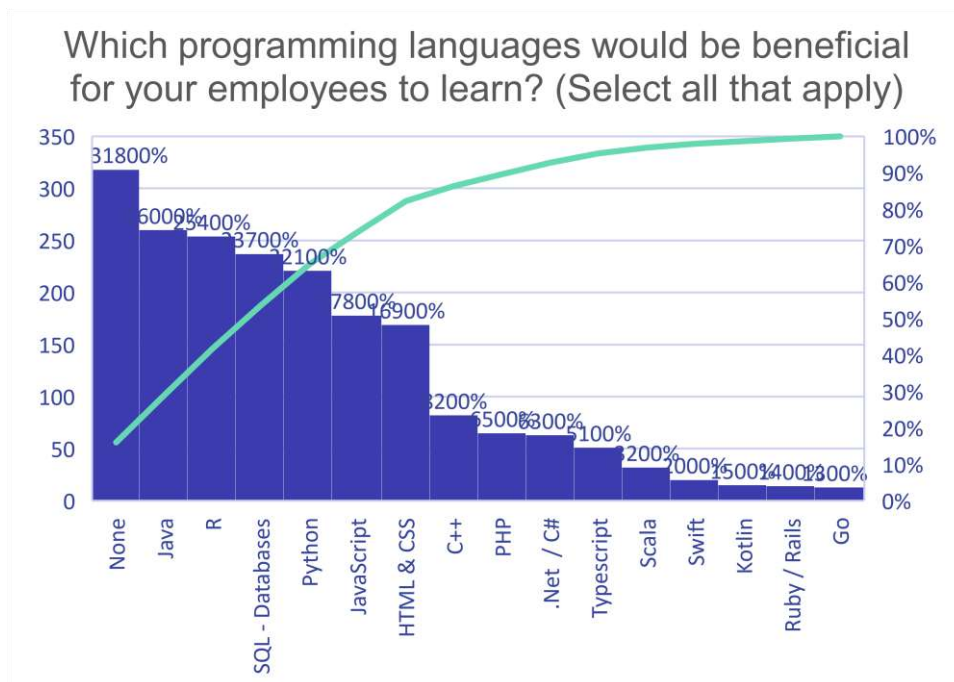


Figure 25 – Desired Programming Languages

According to the survey, Java emerged as the most important programming language followed by R, SQL, Python, JavaScript, HTML & CSS.

Level of trainings needed

As mentioned in the consolidated report (D3.1), in terms of specific training areas, there is interest in basic, intermediate, and advanced level of **Cybersecurity** training. In Business Development, intermediate and advanced trainings are the most popular. Basic and intermediate blockchain trainings are both popular. Intermediate trainings are the most popular in Fintech and EdTech. From the survey results, data analysis and interpretation along with social media marketing, AI applications and cloud computing and web and software development were also deemed very important.

For Data Analysis and Interpretation, training is segmented into basic, intermediate, and advanced levels. A basic level would encompass fundamental statistical concepts, data collection methods, and simple data visualization techniques. This level is suitable for beginners or those needing a foundational understanding. The intermediate level delves into more complex data modeling, predictive analytics, and the use of specialized tools like Excel or Tableau. Advanced training covers machine learning algorithms, big data technologies, and complex data mining techniques, catering to seasoned data professionals seeking to enhance their expertise.

In Social Media Marketing, intermediate and advanced trainings are the most sought after. The intermediate level includes strategic planning, content creation, audience targeting, and performance analysis using platforms like Facebook, Instagram, and Twitter. Advanced training goes further into influencer marketing, paid advertising strategies, conversion optimization, and integrating social media with other digital marketing channels.

For AI and Cloud Computing, basic and intermediate trainings are of equal interest. The basic level in AI covers fundamental concepts of machine learning, simple algorithms, and introductory programming in languages like Python. In Cloud Computing, it includes understanding cloud models, basic cloud services, and initial hands-on experience. The intermediate level in AI explores more complex algorithms, neural networks, and real-world applications, while in Cloud Computing, it delves into cloud architecture, security, and advanced services.

For Cybersecurity, a basic level would include foundational understanding, awareness of common threats, basic risk management, and essential security protocols. It's often targeted at non-technical staff or those new to the field, while intermediate and advanced levels would include intrusion detection, incident response, network security, and ethical hacking.

In the realm of Web and Software Development, intermediate trainings are the most popular. This level includes understanding and applying programming languages like HTML, CSS, JavaScript for web development, or Java, C# for software development. It also covers responsive design, database integration, version control, and basic software architecture.

For Business Development an Intermediate level would include skills like strategic planning, customer relationship management, and sales forecasting. It's often aimed at sales and marketing professionals looking to expand their strategic capabilities, while an advanced Level would cover topics like mergers and acquisitions, global market expansion, etc.

For Blockchain basic skills could be considered a basic knowledge of cryptocurrencies, and how blockchain can be applied in various industries, and for an intermediate level would be to explore smart contracts, decentralized applications, and blockchain development.

For Fintech, an intermediate level would include understanding financial regulations, digital banking, robo-advisors, and payment technologies. For ed-tech an intermediate level would cover the integration of technology in education, including Learning Management Systems (LMS), virtual classrooms, and adaptive learning technologies. It's suitable for educators, administrators, and tech professionals working in the education sector.

Ranking of current key digital skills needs

Based on the results from the consolidated report, the key areas for developing digital skills have been identified, reflecting the current trends and demands in the industry. These areas, ranked by popularity, include **Data Analytics and Big Data, AI, Cybersecurity,**

No1	Data Analysis and Interpretation
No2	Social media marketing & Analytics
No3	Advanced Excel
No4	Cybersecurity
No5	Artificial Intelligence / Machine Learning
No6	Digital project Management
No7	Cloud Computing
No8	Web Development /Software
No9	Big Data management
No10	E-commerce digital skills
No11	Agile Development
No12	Blockchain
No13	Virtual Comms Tools (zoom, Teams, e.t.c)
No14	UI/UX

No15	DevOps
No16	Scrum Master

Table 1 – Rank of digital subject areas per popularity in the 7 partner countries

Key digital skills per industry

The digital skills' trends and demands already mentioned above are different between industries. As per the collected data from all the national reports the proposed digital skills trends across various industries could be as follows:

1. Information and Communication Sector:

- Software development and programming languages (e.g., Python, Java, JavaScript, C++)
- Web development and design (HTML, CSS, UX/UI design)
- Database management and SQL
- Cloud computing and virtualization (AWS, Azure, Google Cloud)
- Cybersecurity and information security
- Artificial Intelligence (AI) and Machine Learning (ML)
- DevOps and Continuous Integration/Continuous Deployment (CI/CD)

2. Healthcare Sector:

- Medical data analysis and health data privacy

3. Manufacturing Sector & construction Sector:

- Industrial Internet of Things (IIoT) and smart manufacturing
- 3D printing
- Blockchain

4. Finance Sector:

- Financial data analysis and data visualization
- Data Privacy

5. Food and Agrifood Sector:

- Blockchain
- E-commerce digital skills
- Social media marketing & Analytics.

Comparison to initial list of training proposals

The consolidated report (D3.1) underlines the significance of various key competencies that are vital across multiple departments and industries. These competencies are not only reflective of the current technological trends but are also indicative of the direction in which modern businesses are heading.

Some of these areas are briefly explained below:

Data Analysis and Interpretation

In an age where data is often referred to as the 'new oil,' the ability to analyze and interpret data is essential. This skill goes beyond mere number crunching; it involves extracting meaningful insights that can drive decision-making and strategy. Organizations that can understand and leverage data are better positioned to identify opportunities, mitigate risks, and create value for their stakeholders.

Cybersecurity

With the increasing amount of data being collected and stored online, the importance of cybersecurity cannot be overstated. Cybersecurity is crucial for protecting sensitive information, maintaining privacy, and ensuring the integrity of systems. A breach in cybersecurity can have devastating consequences, ranging from financial loss to reputational damage. Thus, having robust cybersecurity measures is not just a technical necessity but a fundamental business requirement.

Social Media Marketing & Analytics, Blockchain, Big Data Management

The rise of social media has transformed the way businesses interact with their customers. Social Media Marketing & Analytics enable organizations to engage with their audience, build brand awareness, and gather valuable customer insights.

Blockchain technology, on the other hand, is revolutionizing transactions by providing a secure and transparent way to record them. Its applications extend beyond cryptocurrencies and are being employed in various sectors, including supply chain management and healthcare.

Big Data Management is another critical competency, allowing organizations to handle vast amounts of data efficiently. It involves the collection, processing, and analysis of large datasets, enabling businesses to derive actionable insights.

UX/UI, Agile Development, Scrum Master, DevOps

The focus on customer experience has led to the prominence of UX/UI (User Experience/User Interface) design. These skills are necessary for creating intuitive and engaging digital products that meet user needs and expectations.

Agile Development, Scrum Master, and DevOps are methodologies that emphasize collaboration, flexibility, and continuous improvement. These practices are essential for rapid and responsive development, ensuring that products are delivered efficiently and meet quality standards.

Project Management Tools

Project Management Tools are indispensable in today's complex business environment. They enable teams to plan, execute, and monitor projects effectively. By streamlining workflows and enhancing collaboration, these tools contribute to the successful completion of projects within scope, time, and budget constraints.

Advanced Excel, Virtual Communication Tools

Advanced Excel skills are essential for in-depth data analysis, allowing for complex data manipulation and visualization. Virtual Communication Tools, on the other hand, facilitate remote collaboration, a necessity in the increasingly globalized and distributed work environment.

Web/Software Development, Digital Marketing, E-commerce Skills

These competencies encompass a broad range of technical skills required for the digital age. Web/Software Development skills are required for creating and maintaining websites and software applications. Digital Marketing techniques are vital for promoting products and services online, while E-commerce Skills are necessary for conducting business over the internet.

Cloud Computing

Cloud Computing reflects the growing reliance on remote servers for data storage and processing. It offers scalability, flexibility, and cost-efficiency, making it an attractive solution for businesses of all sizes.

Artificial Intelligence/Machine Learning (AI/ML)

AI/ML technologies are sought-after for their ability to automate tasks, make predictions, and provide insights that were previously unattainable. They are being incorporated across various departments, from marketing to operations, transforming the way businesses function.

Initially Proposed Training Courses

The initial proposed training courses (preliminary list developed by the training providers of Level Up) included a wide range of topics, focusing on specific technologies and methodologies:

Data Analytics: Courses on data analytics, data literacy, data storytelling, and data-driven management.

AI and Machine Learning: Courses on AI literacy, AI-driven management, AI in healthcare, and machine learning basics.

Cybersecurity: Introduction to cybersecurity, cybercrime concepts, GDPR compliance, communication and network security, and preparation for cybersecurity risks.

Cloud Computing: Introduction to cloud computing, AWS Cloud Practitioner, and overview of popular cloud platforms.

Programming and Development: Courses on programming for non-programmers, web development, program development, SQL, Python, no-coding apps, and game development using C++.

Other Specialized Courses: Courses on IoT, robotics, 3D modeling and printing, VR simulation training, Azure Fundamentals, business analyst junior role, digital contracts, software testing, and quality assurance.

Comparison of initial list and study findings

In the contemporary era of technological advancement, aligning education and training with industry needs is paramount. The consolidated report and the initial proposed training courses present a comprehensive overview of the key competencies and skills vital for the modern workforce. This report will delve into the alignment and divergence between these two aspects, focusing on **data analysis, cybersecurity, AI/ML, specific skills, and cloud computing**, as these were evaluated as the key areas that our Level Up consortium needs to focus on, based on the primary and secondary data gathered by all partners in WP3.

Alignment with Data Analysis

Both the consolidated report and the initial proposed training courses emphasize the importance of data analysis, interpretation, and data-driven decision-making. In an age where data is considered a valuable asset, the ability to analyze and interpret it is essential. The consolidated report identifies this as a core competency, while the training courses offer specialized modules to enhance data literacy, storytelling, and management. This alignment reflects a shared understanding of the role of data in shaping business strategies and driving innovation.

Focus on Cybersecurity

Cybersecurity emerges as a common theme in both the report and the training courses. The consolidated report highlights the importance of safeguarding sensitive information and maintaining the integrity of systems. The training courses complement this by offering specific modules on various aspects of cybersecurity, including cybercrime concepts, GDPR compliance, and network security. This focus underscores the recognition of cybersecurity as a critical component in the digital landscape, essential for protecting assets and building trust.

Emphasis on AI/ML

Artificial Intelligence and Machine Learning (AI/ML) are recognized by both the proposed initial courses and the consolidated report as significant areas of focus. The report identifies AI/ML as sought-after skills, reflecting their transformative potential across various industries. The training courses offer specialized training in these areas, including AI literacy, AI-driven management, and machine learning basics. This emphasis illustrates a concerted effort to equip the workforce with the skills needed to leverage AI/ML technologies, fostering innovation and efficiency.

Divergence in Specific Skills

While there is significant alignment in many areas, a notable divergence exists in the emphasis on specific skills. The consolidated report focuses on broader competencies like social media marketing, blockchain, big data management, and UX/UI. In contrast, the initially proposed training courses offer more specialized and technical training, including courses on IoT, robotics, 3D modeling, and VR simulation. This divergence reflects a difference in approach, with the report highlighting general competencies and the training courses targeting specialized skills that cater to specific industry needs.

Common Ground in Cloud Computing

Both the report and the training courses recognize the growing importance of cloud computing. The report highlights it as a sought-after skill, indicative of the shift towards cloud-based solutions. The training courses provide specific modules on cloud platforms, including an introduction to cloud computing and popular cloud services. This common ground signifies an acknowledgment of the role of cloud computing in enhancing scalability, flexibility, and cost-efficiency.

Summary

In summary, the consolidated report and the initial proposed training courses share common themes in areas like data analysis, cybersecurity, AI/ML, and cloud computing. This alignment illustrates a coherent understanding of the current technological landscape and the skills required in the modern workforce. The divergence in specific skills offers a nuanced perspective, reflecting different approaches to skill development. Overall, the emphasis on these key areas in both the report and the training courses reflects a strategic focus on nurturing competencies that are vital for the digital age. It underscores the commitment to fostering a workforce that is well-equipped to navigate the complexities of emerging technologies and the ever-evolving demands of the industry. The alignment and divergence between the report and the training courses provide valuable insights into the multifaceted nature of skill development and the need for a balanced approach that caters to both general competencies and specialized skills.

Compiled Data for proposed digital skills courses

The proposed courses that follow, are based on the initial proposed courses and the results of the consolidated report. It is important to note that the details outlined herein are only a proposal, offering a glimpse of the potential curriculum. They are intended to serve as a starting point for discussion and collaboration, allowing us to tailor the courses to align with specific goals, requirements, and industry trends, closely matching also the specific training expertise of our Level Up consortium.

In summary, the consolidated report and the initial proposed training courses share common themes in areas like data analysis, cybersecurity, AI/ML, and cloud computing. This alignment illustrates a coherent understanding of the current technological landscape and the skills required in the modern

workforce. The divergence in specific skills offers a nuanced perspective, reflecting different approaches to skill development. Overall, the emphasis on these key areas in both the report and the training courses reflects a strategic focus on nurturing competencies that are vital for the digital age. It underscores the commitment to fostering a workforce that is well-equipped to navigate the complexities of emerging technologies and the ever-evolving demands of the industry. The alignment and divergence between the report and the training courses provide valuable insights into the multifaceted nature of skill development and the need for a balanced approach that caters to both general competencies and specialized skills.

No.	Proposed Course Title	Proposed Skill definition/area	Proposed Competences	Proposed Levels of acquired Knowledge	Proposed assessment methods
1	Data Analytics	Data Analytics involves the use of statistical, mathematical and computational techniques to collect, process and interpret large sets of data.	<ul style="list-style-type: none"> -Data Manipulation -Statistical Analysis -Database Querying -Data Integration -Data Preprocessing -Data Exploration -Visual Storytelling -Data Visualization etc. 	Grade 1-Beginner Grade 2-Intermediate Grade 3-Advanced	Through Practical coding assignments, projects focused on data analysis and visual storytelling, quizzes, assessments
2	Social Media Marketing and Analytics	Social Media Marketing Analytics is the practice of gathering and analyzing data from social media platforms to assess the performance of marketing efforts and make informed decisions. It involves tracking key metrics such as engagement, reach, likes, shares, comments, and conversion rates to understand how social media content resonates with the target audience	<ul style="list-style-type: none"> -Descriptive Analytics -Predictive Analytics -Segmentation Analysis -ROI Analysis -Social Media Analytics etc. 	Grade 1-Beginner Grade 2-Intermediate	Through Quizzes Assessments and presentations
3	Micro-Lessons in Data, Artificial Intelligence, Coding, and	Concise and targeted micro-lessons designed to impart essential skills in Data Analysis, Artificial Intelligence (AI), Coding,	<ul style="list-style-type: none"> -Python -Big Data - Natural Languages (NLP) -Statistical Modeling etc. 	Grade 1-Beginner Grade 2-Intermediate	Through assignments, projects and quizzes.

	specific departments (e.g., Data in healthcare)	and specialized areas like Data in Healthcare.			
4	Cybersecurity	Essential skills and knowledge to protect digital systems, networks, and data from unauthorized access and attacks. In today's interconnected world, where cyber threats are increasingly prevalent, cybersecurity has become a critical area of concern for individuals, businesses, and governments alike.	-Threat Analysis -Network Security -Security Awareness -Data Protection etc.	Grade 1-Beginner Grade 2-Intermediate	Through Quizzes Assessments
5	Data Literacy	The Data Awareness course introduces participants to the topic of data and enables them to become more data literate with a holistic overview of modern data technologies such as	- Understand Data Concepts -Data Visualization -Analysis and Interpretation of data etc.	Grade 1-Beginner Grade 2-Intermediate	Through reports, Quizzes, presentations
6	Data Storytelling	In the Data Storytelling course, participants the most important techniques for effectively communicating data-driven results and abstract statistical concepts in order to successfully carry out a presentation that is appropriate for the target group.	-Understanding Data -Visual Representation -Real World Applications etc.	Grade 1-Beginner Grade 2-Intermediate Grade 3-Advanced	Through practical Data reporting And Visual storytelling through specific tools

7	Data Driven Management	Empower professionals with the skills and knowledge to leverage data in decision-making processes within an organizational context.	<ul style="list-style-type: none"> - Data Analysis and Interpretation -Data Visualization -Predictive Analytics etc. 	Grade 1-Beginner Grade 2-Intermediate	Through reports, Quizzes, assessments
8	Artificial Intelligence Machine Learning Basics	Introduce the foundational concepts and skills in Artificial Intelligence (AI) and Machine Learning (ML)	<ul style="list-style-type: none"> -Python Programming Fundamentals - Basic Algorithms - Data Preprocessing etc. 	Grade 1-Beginner Grade 2-Intermediate	Through Practical assignments, projects quizzes/assessments
9	Cloud Computing	Basic understanding of cloud technologies, architectures, and services. In the era of digital transformation, cloud computing has become a fundamental building block for modern businesses, enabling scalable, flexible, and cost-effective solutions.	<ul style="list-style-type: none"> -Cloud Security -Cloud Applications -Cloud Networking -Cloud in specific industries etc. 	Grade 1-Beginner Grade 2-Intermediate	Through Quizzes, assessments
10	Advanced Excel	For individuals looking to master the more complex and powerful features of Microsoft Excel. Excel is a widely-used spreadsheet tool that offers far more than basic data entry and calculations, and this program delves into its advanced capabilities.	<ul style="list-style-type: none"> - Advanced Data Analysis - Financial Modeling - Pivot Tables and Pivot Charts - Data Validation and Conditional Formatting etc. 	Grade 3 Advanced	Practical examples through Excel Sheets

11	Virtual Communication Tools	Virtual Communication Tools have emerged as a vital component of effective communication	<ul style="list-style-type: none"> -Understanding Virtual Communication -Platforms & Tools -Security Etc. 	Grade 2-Intermediate	Through online Assessment
12	Web and Software Development	Essential programming skills for developing and managing websites and applications.	<ul style="list-style-type: none"> -Javascript -Backend development -Frontend development -NoD.JS -SQL 	Grade 1-Beginner Grade 2-Intermediate	Through Full stack development projects/assessments/quizzes
13	Blockchain	As a decentralized and distributed ledger system, blockchain has revolutionized various industries, from finance and supply chain to healthcare and governance.	<ul style="list-style-type: none"> -Intro to Cryptocurrencies -Security -Open source -Centralized and open transactions 	Grade 1-Beginner	Through quizzes/assessments
14	DevOps	Software development (Dev) and IT operations (Ops), creating a collaborative and efficient environment for building, testing, and deploying software. I	<ul style="list-style-type: none"> -Introduction to DevOps -Version Control with Git -Cloud Platforms -DevOps Principles 	Grade 1-Beginner Grade 2-Intermediate	Through quizzes/assessments

Conclusion

The comprehensive research conducted across various countries, including Cyprus, Finland, Germany, Greece, Poland, Hungary, and Italy, has provided valuable insights into the core digital skills deemed crucial for the development of companies in the digital age. The findings emphasize the significance of key capacity areas such as **Cybersecurity, Data Analysis & Interpretation, Artificial Intelligence (AI), Cloud Computing, and Advanced Excel**, among others.

This report provided detailed insights into the digital skills landscape in different countries. For example, in Cyprus, Cybersecurity emerged as a key area for improvement, while in Finland, expertise gaps in AI and data analytics were highlighted. These country-specific findings can guide the development of tailored training programmes. This portfolio sets the stage for the development of targeted training programmes that address the identified skill gaps. Collaboration between training providers, businesses, and policymakers can lead to effective upskilling and reskilling strategies that empower the digital transformation of SMEs.

The common threads across the national surveys indicate a growing recognition of the importance of digital skills in various aspects of business operations. The emphasis on Cybersecurity, Data Analysis, AI, and Cloud Computing reflects the global trend towards digital transformation and the pressing need for upskilling and reskilling in these critical areas.

Furthermore, the survey results support the notion that foundational/basic skills form the backbone of effective work practices, and once established, employees can progress to more advanced digital competencies. The importance of versatility in programming skills and the use of multiple digital tools also emerged as key themes.

In parallel, the initial training courses proposed were found to align closely with the skills that were also emphasized in the findings of the consolidated report.

Overall, the "Level Up" project's findings underscore the strategic focus on nurturing competencies vital for success in the digital age. It sets the stage for targeted training and development initiatives, ensuring that individuals and organizations are well-prepared to navigate the complexities of the modern work market, thereby empowering their digital transformation.

Appendix 1

Graphs from National Reports

Cyprus

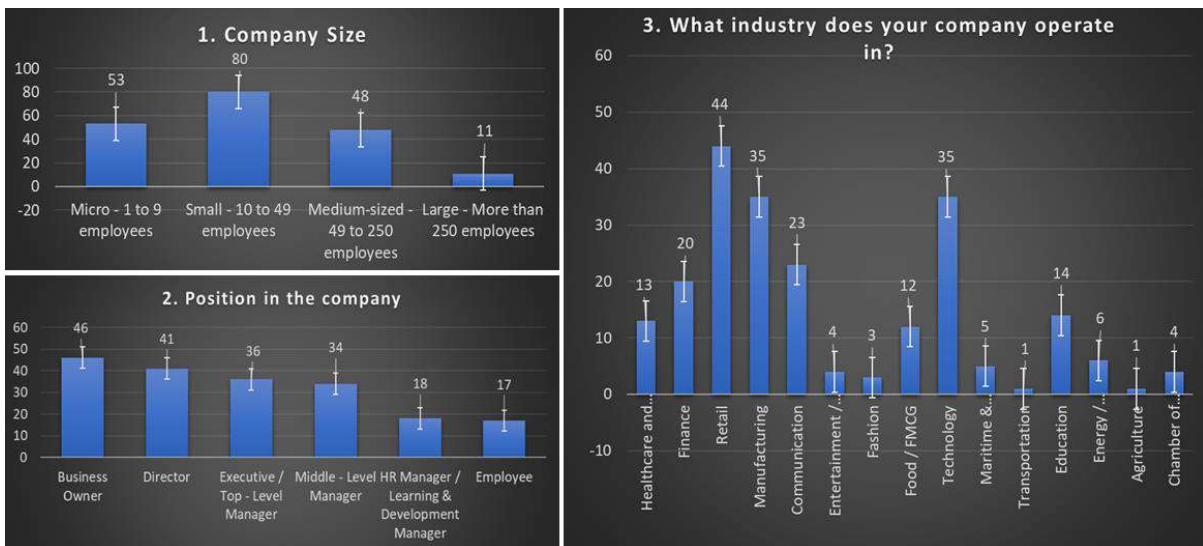


Figure 26 – Appendix1-Cyprus

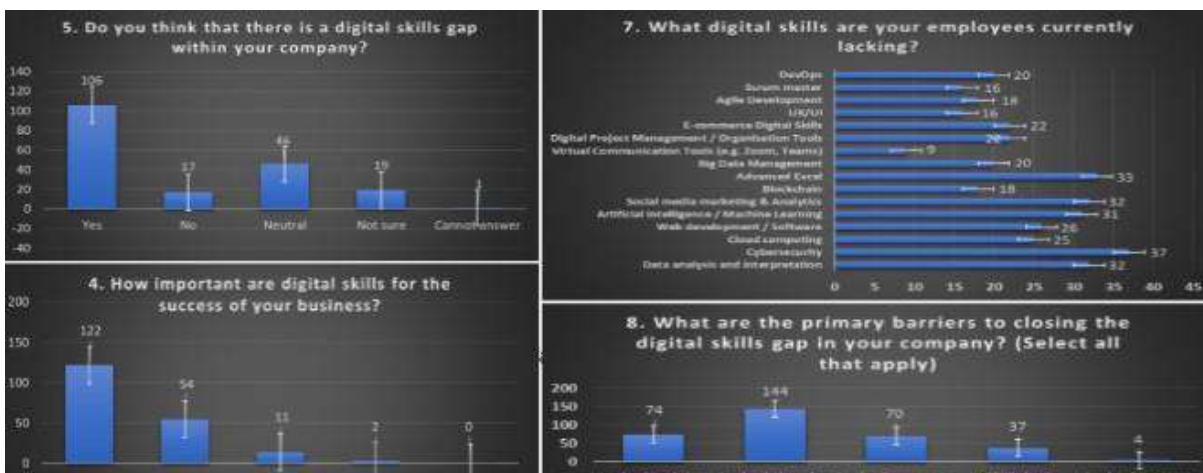


Figure 27 - Appendix1-Cyprus

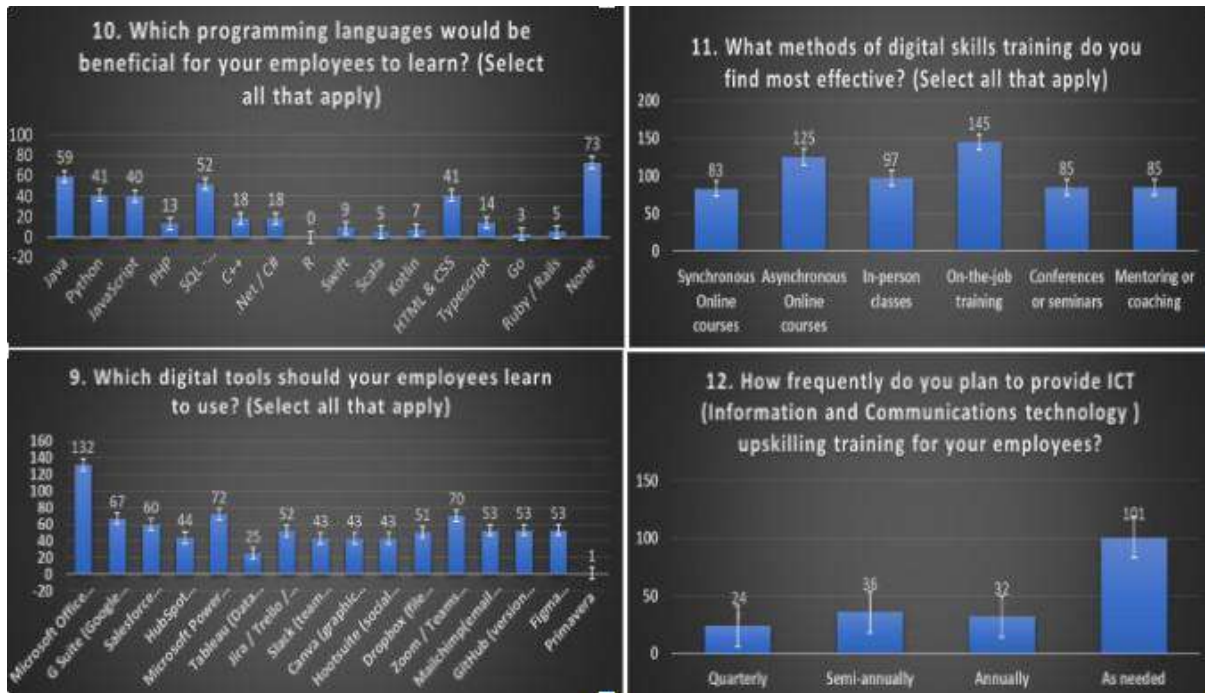


Figure 28 - Appendix1-Cyprus

Finland



Figure 29 - Appendix1-Finland

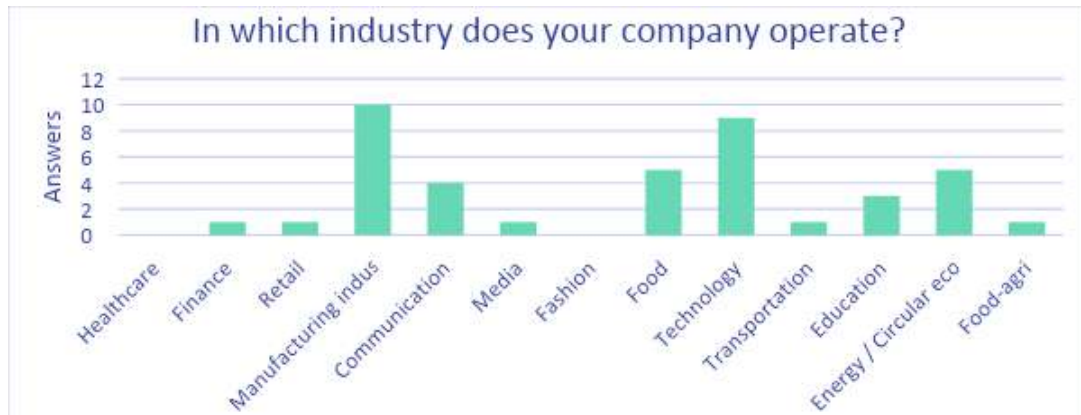


Figure 30 - Appendix1-Finland



Figure 31 - Appendix1-Finland



Figure 32 - Appendix1-Finland

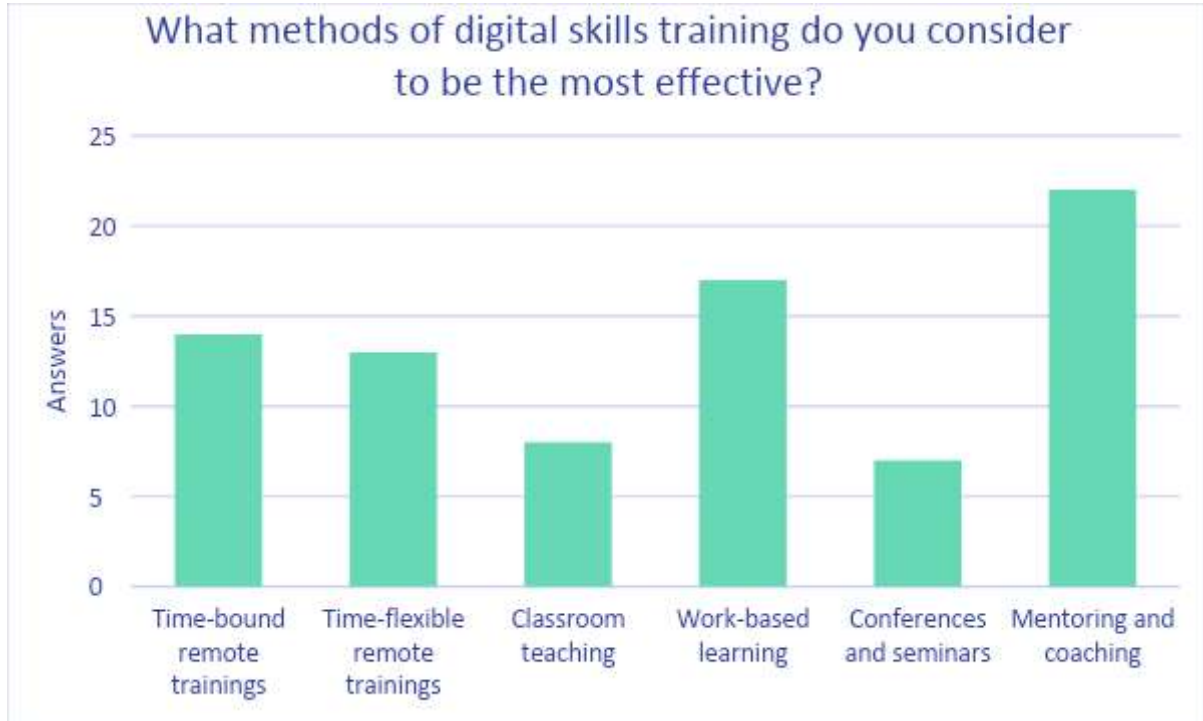


Figure 33 - Appendix1-Finland



Figure 34 - Appendix1-Finland

Germany

Company Size

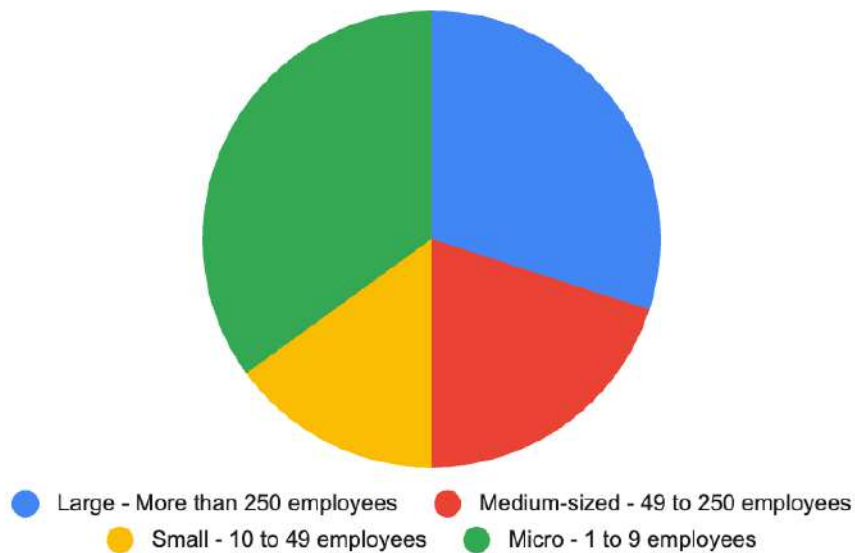


Figure 35 - Appendix1-Germany

Position in the company



Figure 36 - Appendix1-Germany

How important are digital skills for the success of your business?

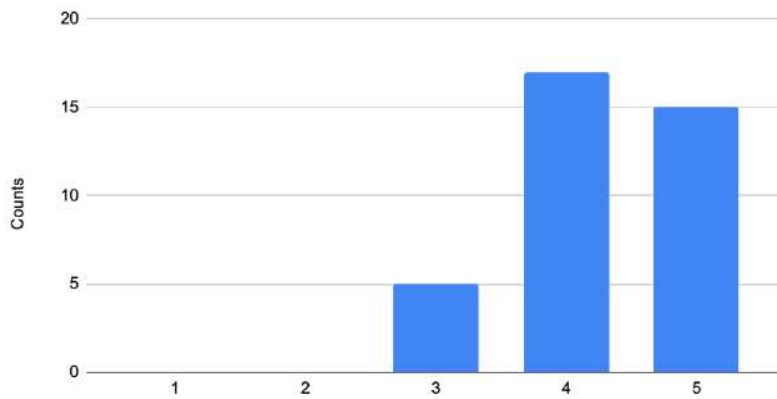


Figure 37 - Appendix1-Germany

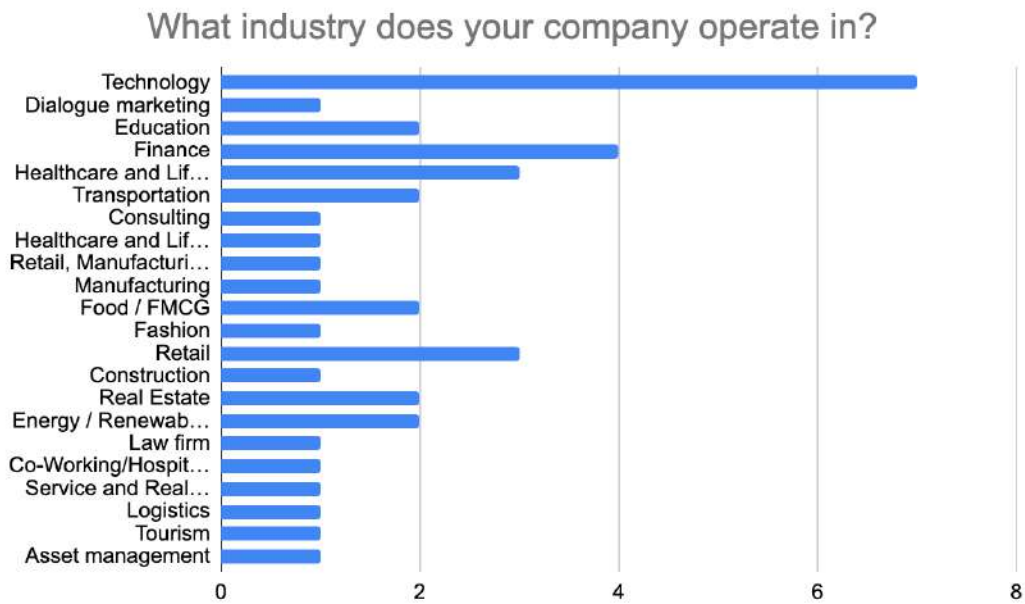
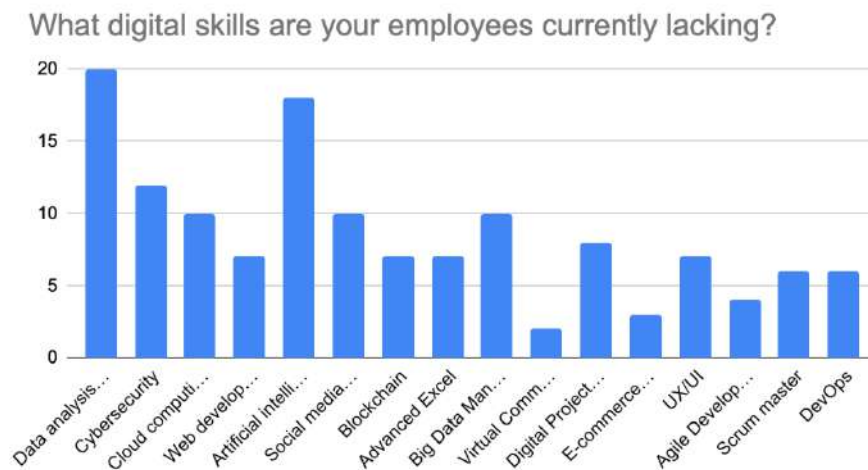


Figure 38 - Appendix1-Germany



14. What digital skills are your employees currently lacking?

Figure 39 - Appendix1-Germany

What are the primary barriers to closing the digital skills gap in your company?

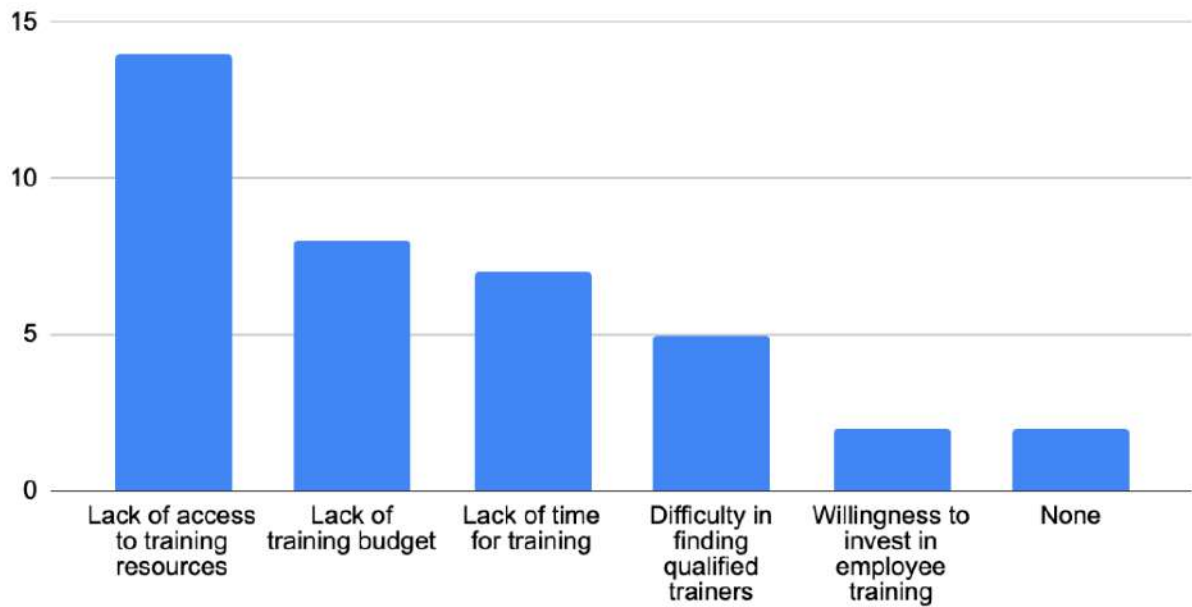


Figure 40 - Appendix1-Germany

How important is it for government and educational institutions to support the development of digital skills?

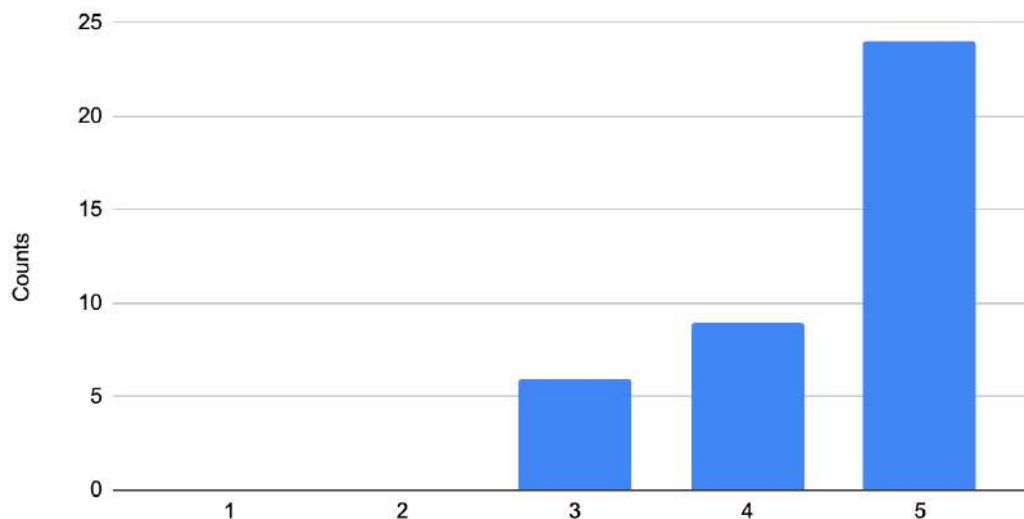


Figure 41 - Appendix1-Germany

Which programming languages would be beneficial for your employees to learn? (Select all that apply)

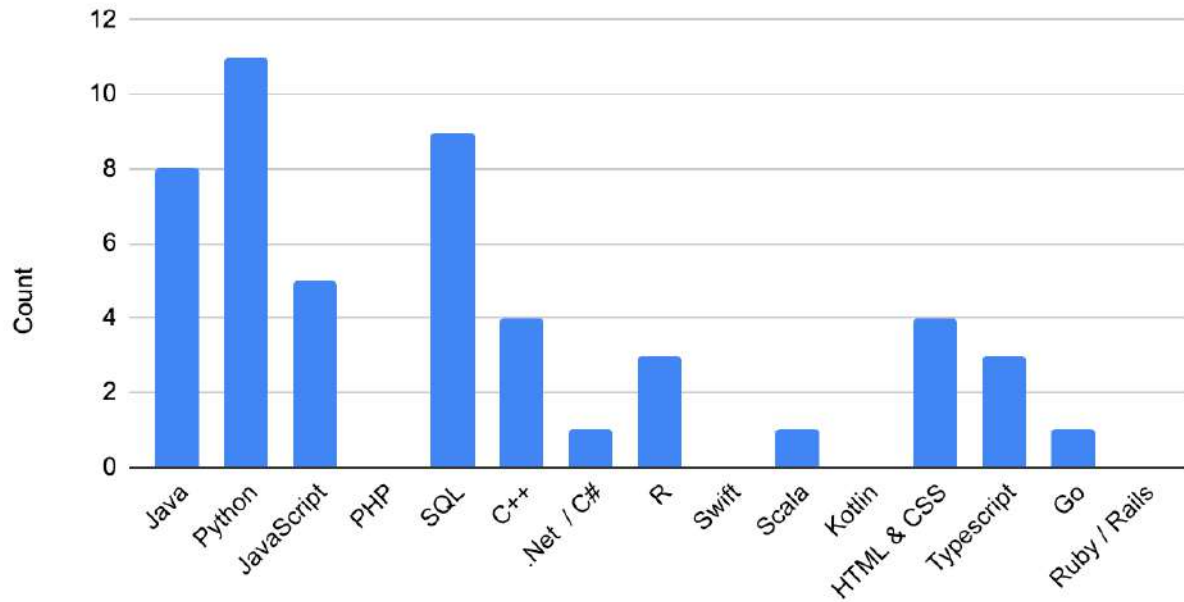


Figure 42 - Appendix1-Germany

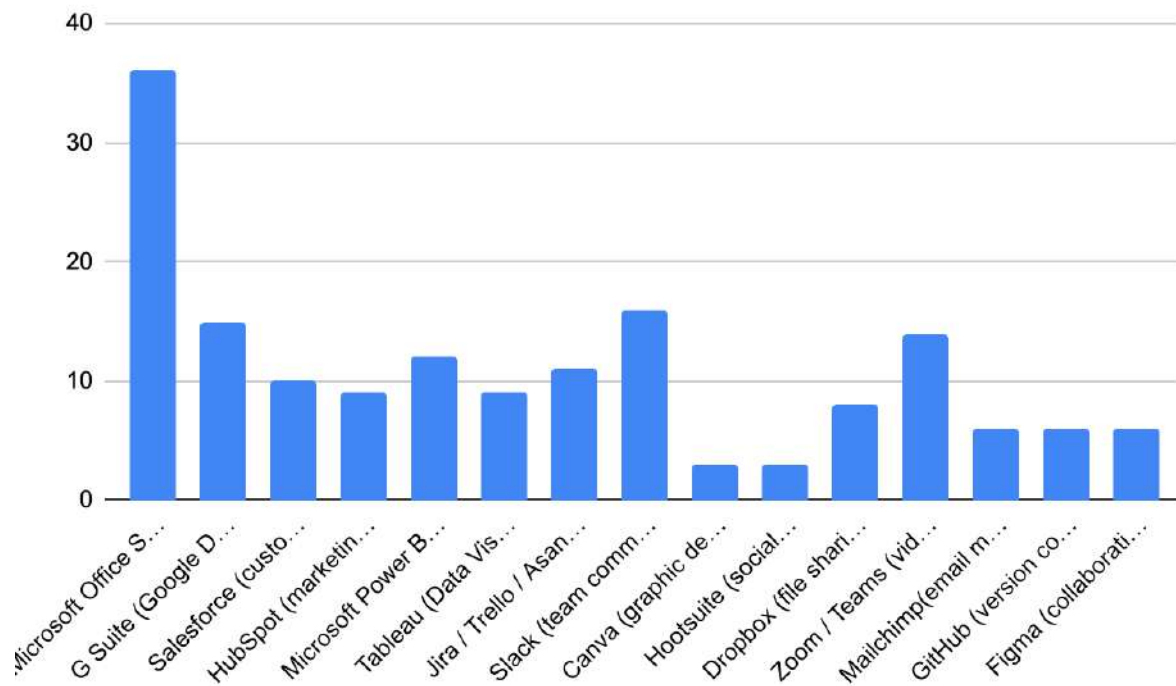


Figure 43 - Appendix1-Germany

Greece

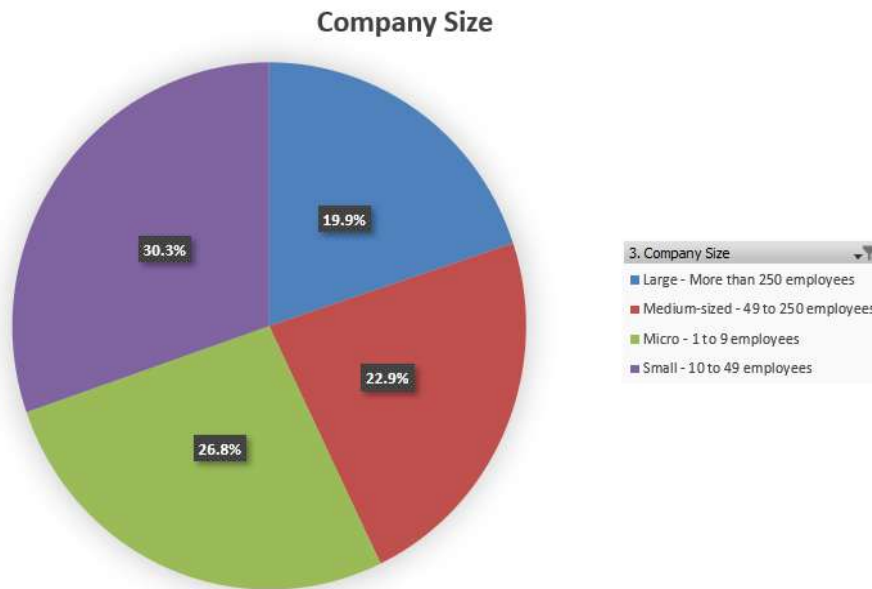


Figure 44 - Appendix1-Greece

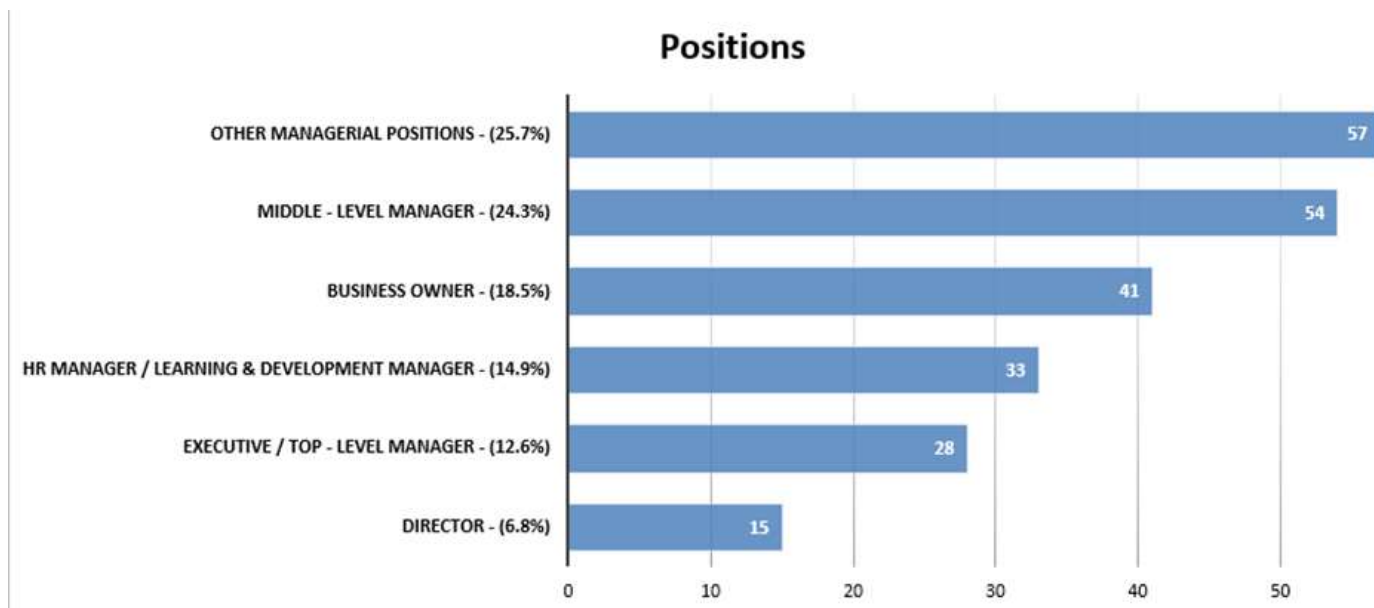


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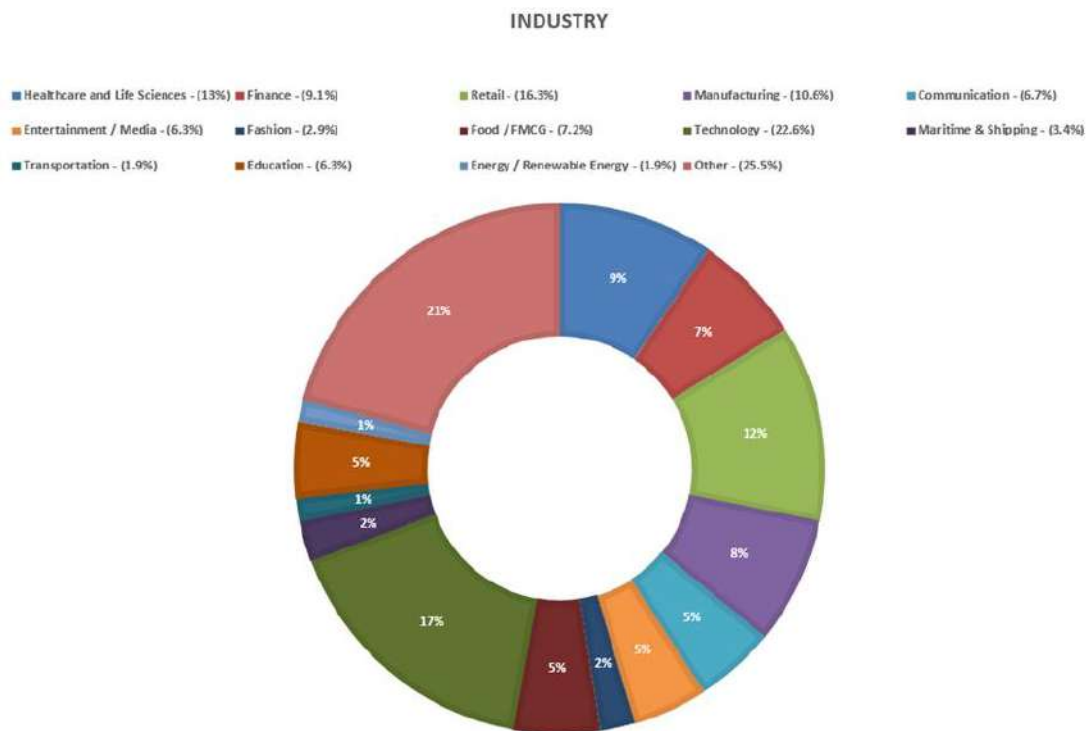


Figure 46 - Appendix1-Greece

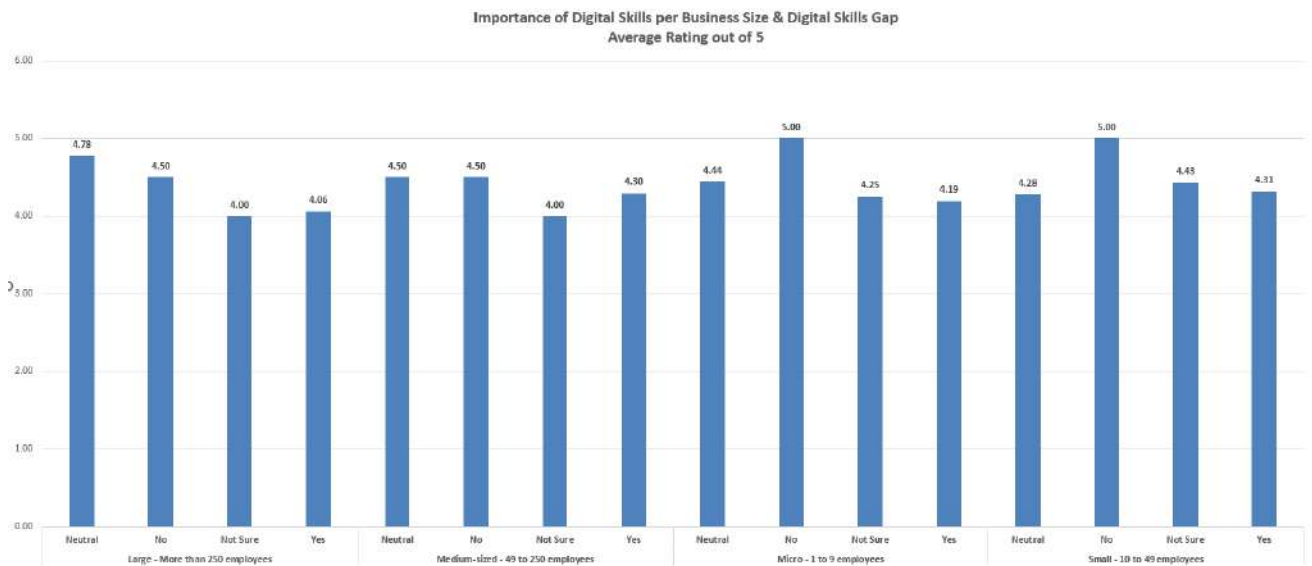


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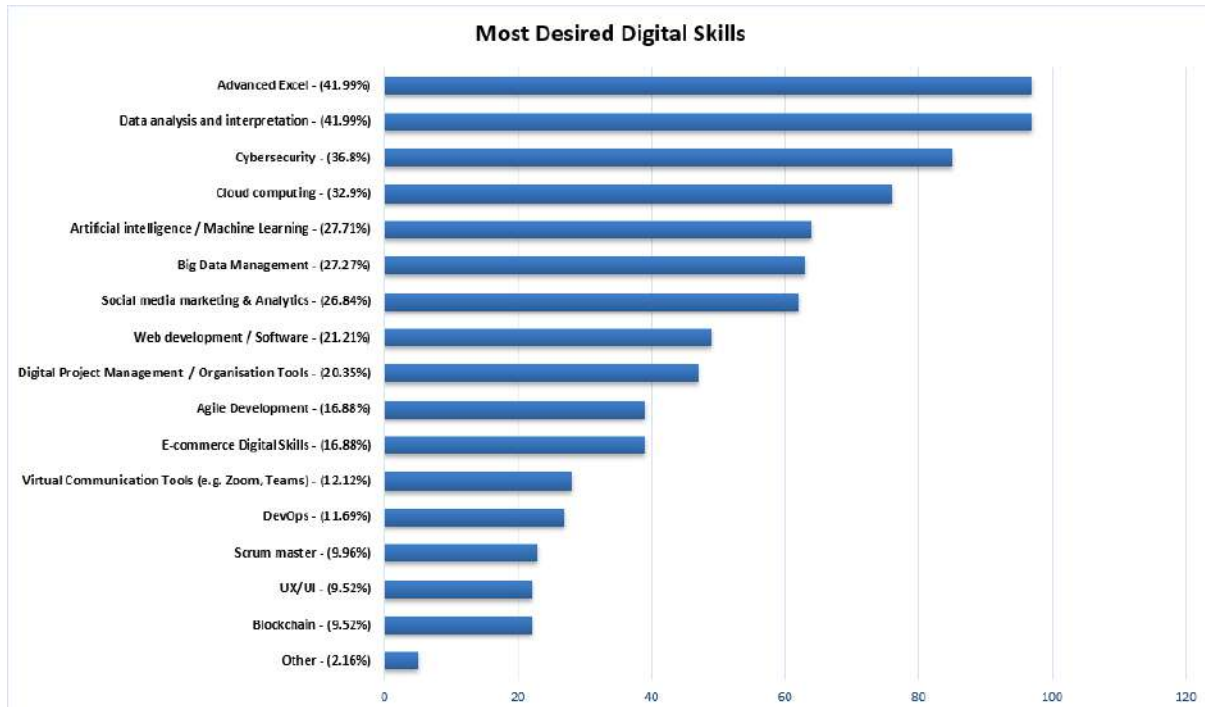


Figure 48 - Appendix1-Greece

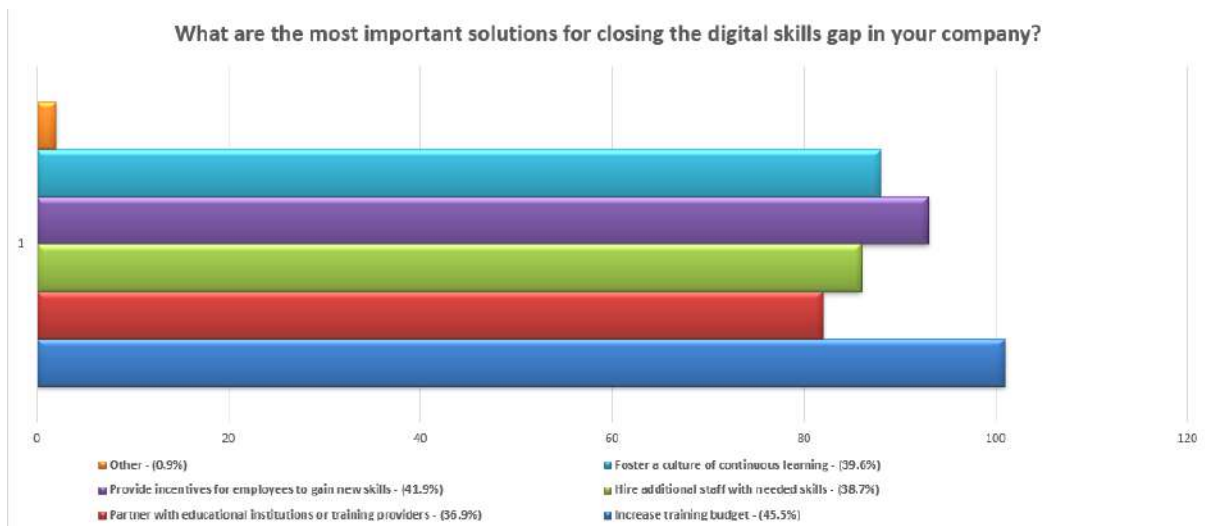


Figure 49 - Appendix1-Greece

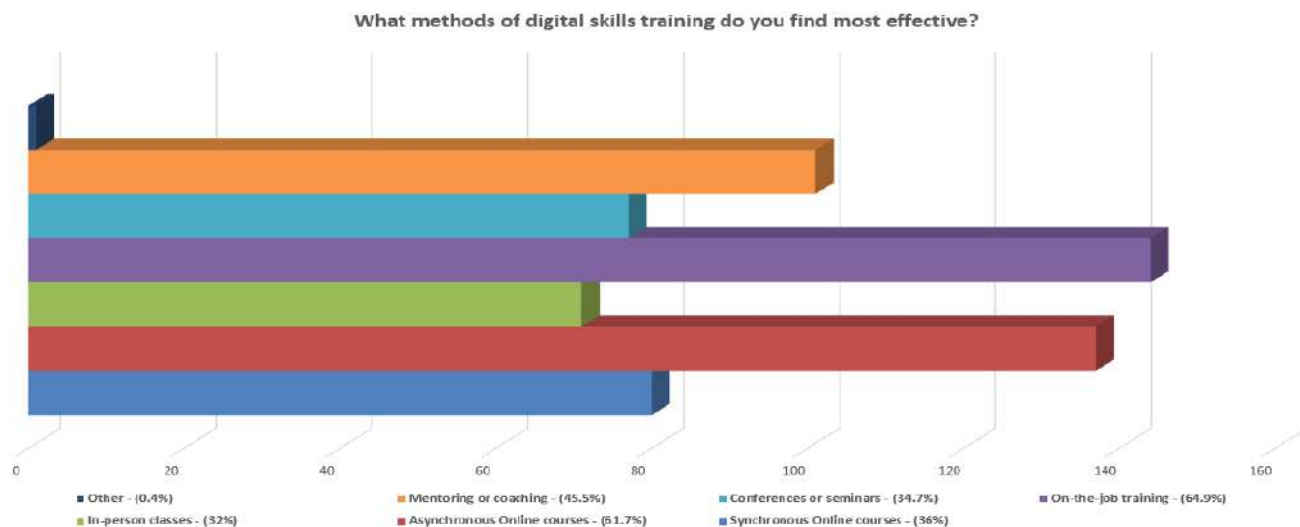


Figure 50 - Appendix1-Greece

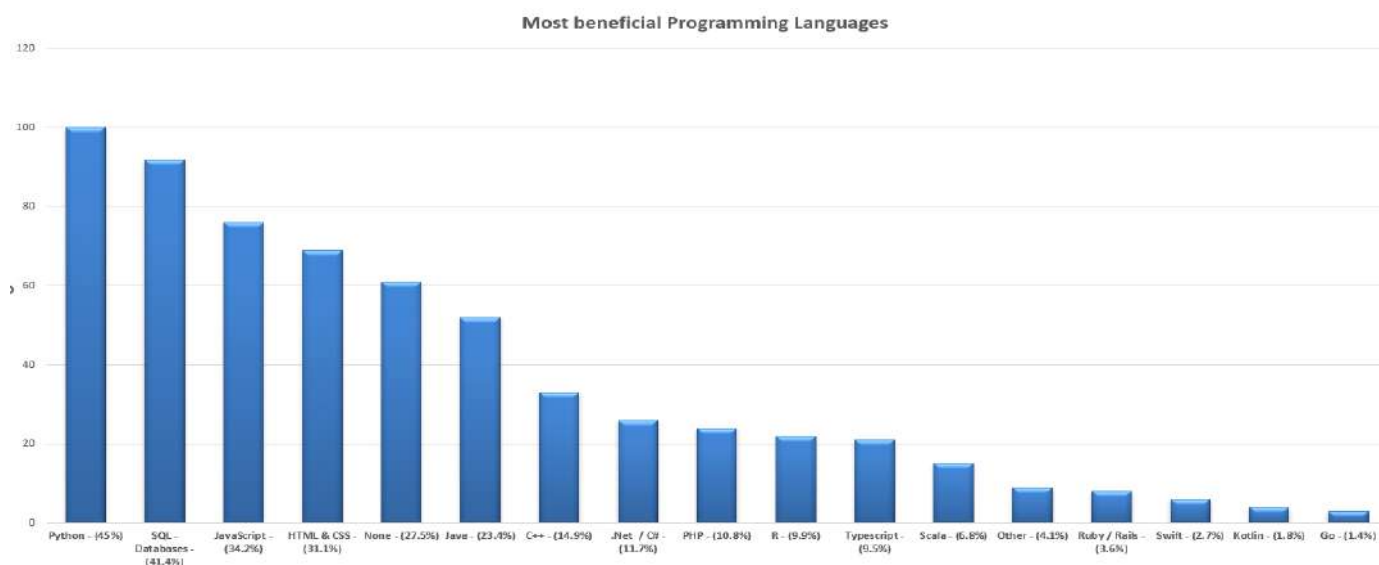


Figure 51 - Appendix1-Greece

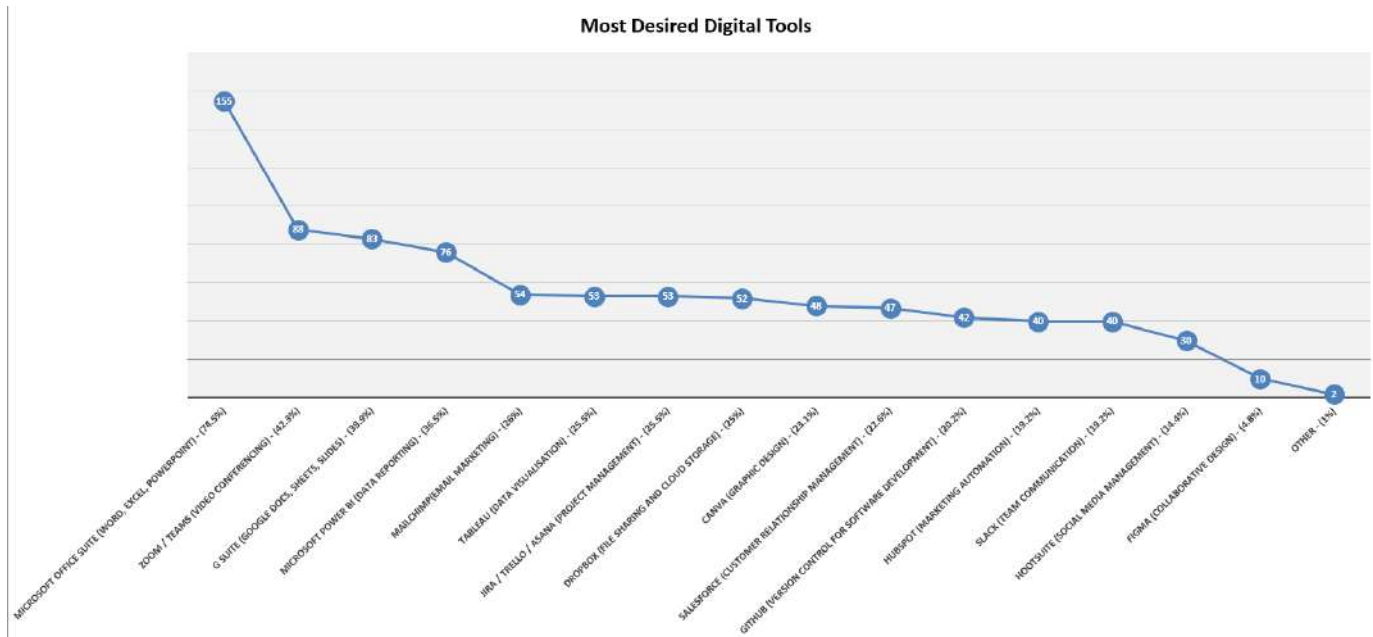


Figure 52 - Appendix1-Greece

How frequently do you plan to provide ICT (Information and Communications technology) upskilling training for your employees?

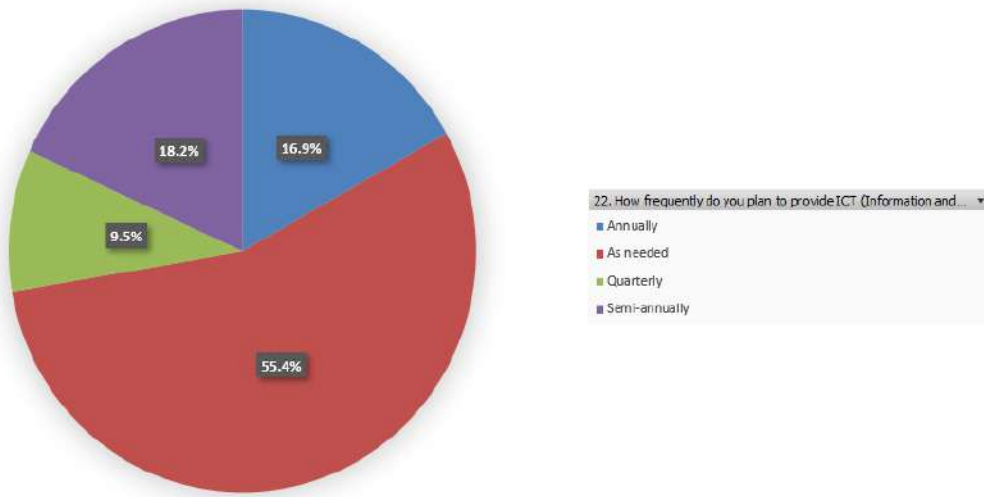


Figure 53 - Appendix1-Greece

Hungary

Company size

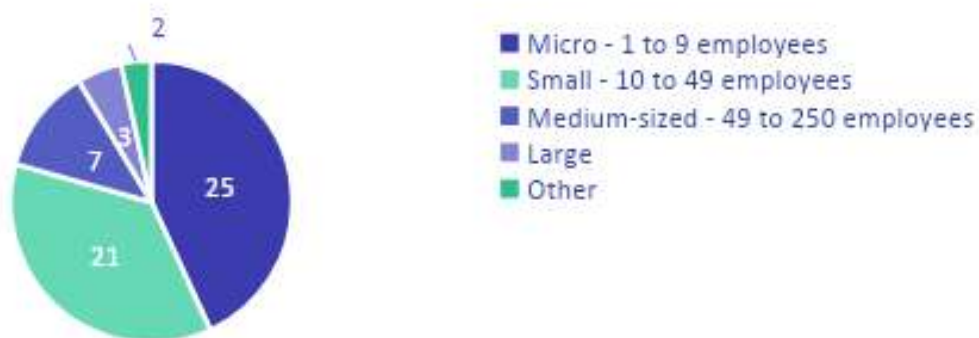


Figure 54 - Appendix1-Hungary

Position in the company



Figure 55 - Appendix1-Hungary

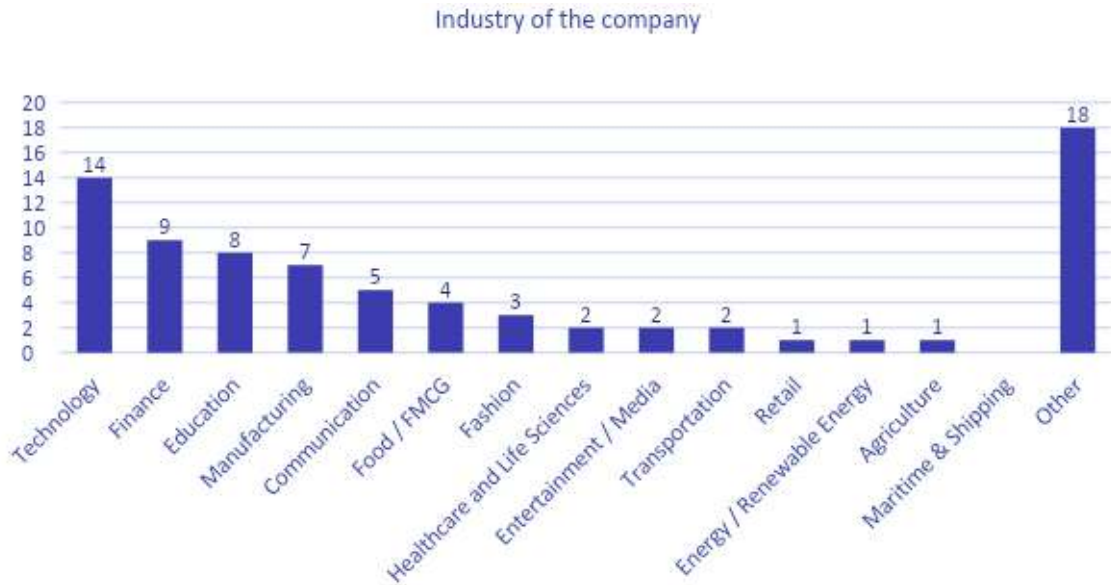


Figure 56 - Appendix1-Hungary

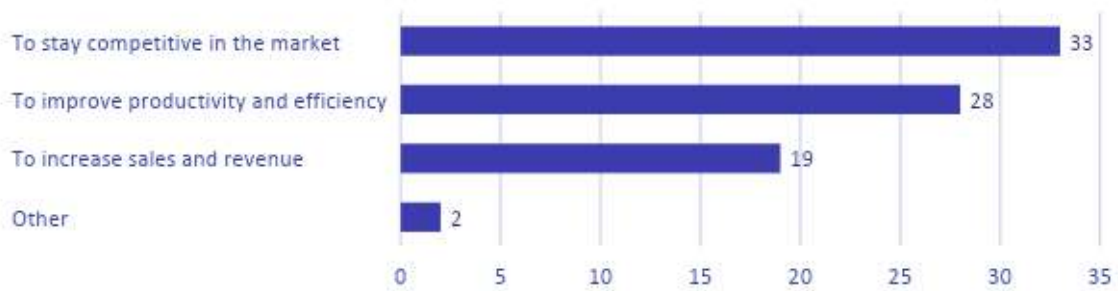


Figure 57 - Appendix1-Hungary

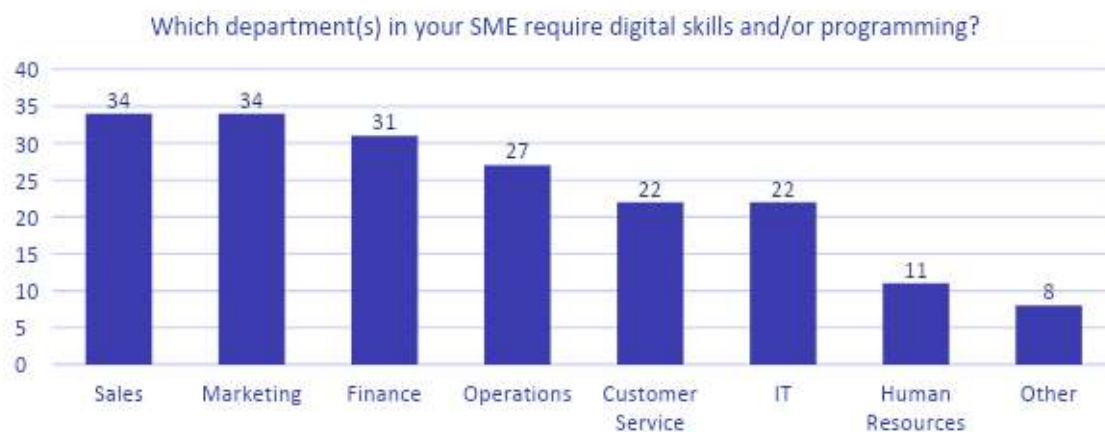


Figure 58 - Appendix1-Hungary

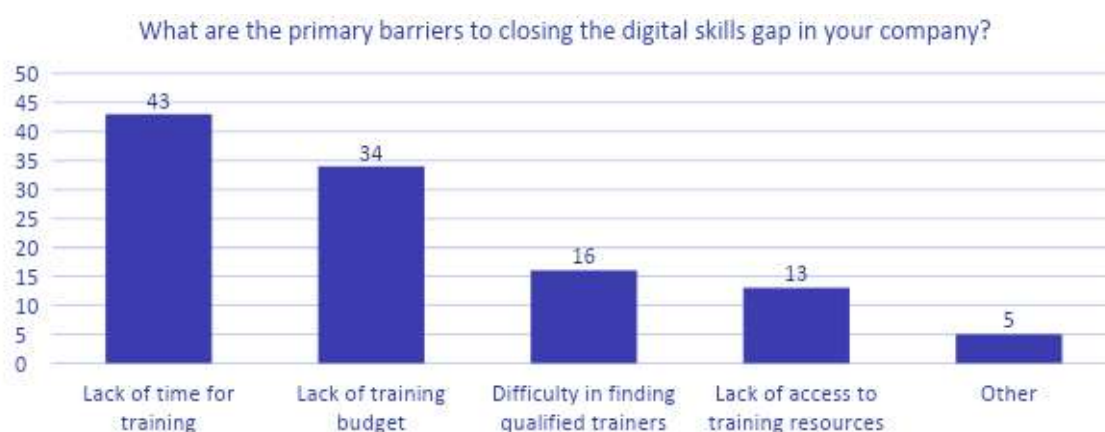
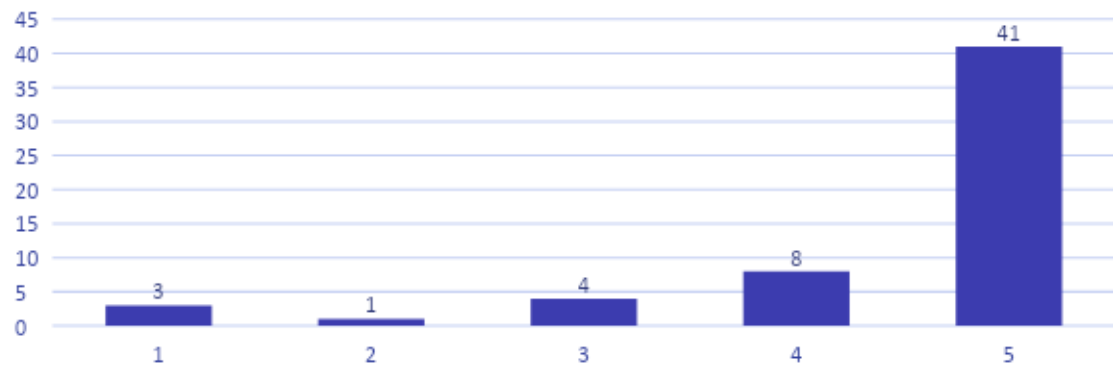


Figure 59- Appendix1-Hungary



Figure 60 - Appendix1-Hungary



Importance of support of the government and educational institutions in digital skills development

Figure 61 - Appendix1-Hungary



Figure 62 - Appendix1-Hungary

How frequently do you plan to provide ICT (Information and Communicationstechnology) upskilling training for your employees?

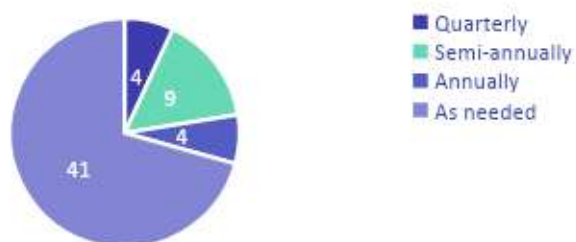


Figure 63 - Appendix1-Hungary



Figure 64 - Appendix1-Hungary

Italy

3. Dimensioni dell'azienda

42 risposte

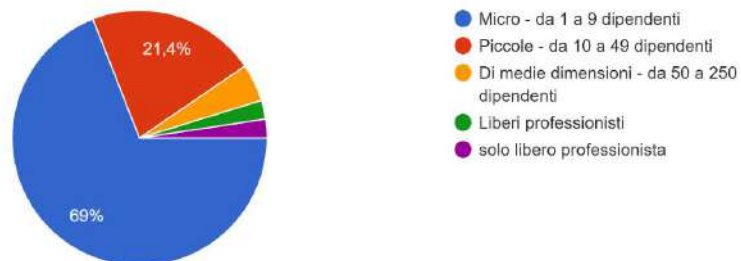


Figure 65 - Appendix1-Italy

7. Posizione nell'azienda (è possibile selezionare più opzioni)

42 risposte

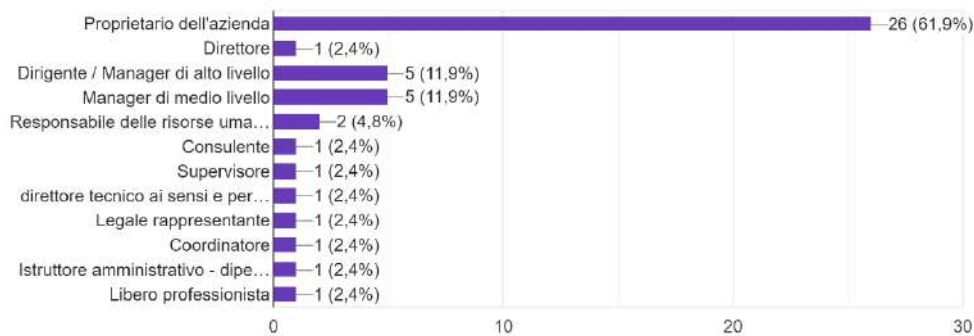


Figure 66 - Appendix1-Italy

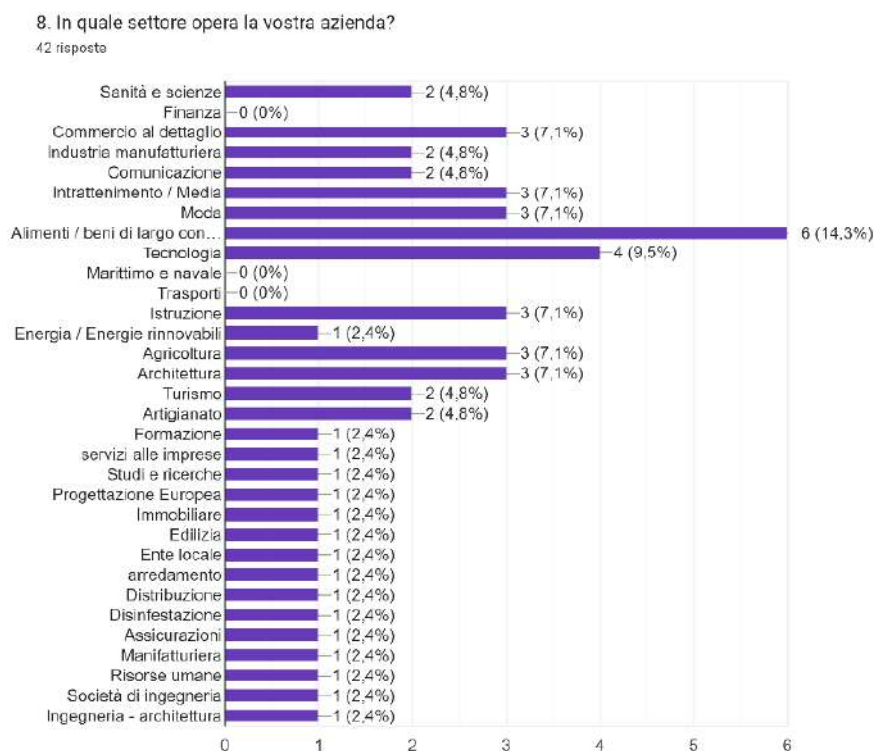


Figure 67 - Appendix1-Italy

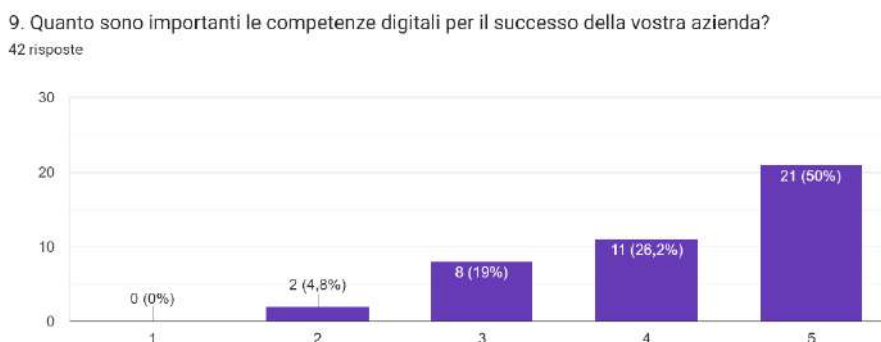


Figure 68 - Appendix1-Italy

10. Pensate che ci sia un gap di competenze digitali all'interno della vostra azienda?

42 risposte

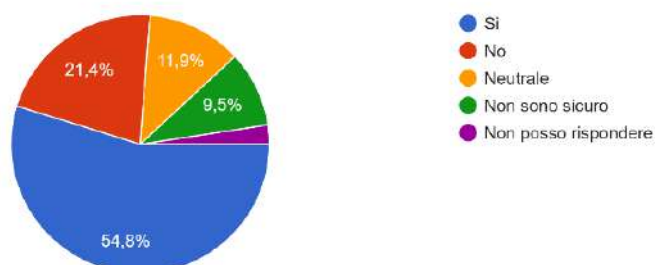


Figure 69 - Appendix1-Italy

11. Quali sono le ragioni principali per cui la vostra PMI ha bisogno di colmare il proprio gap di competenze digitali? (è possibile selezionare più di una risposta)

42 risposte

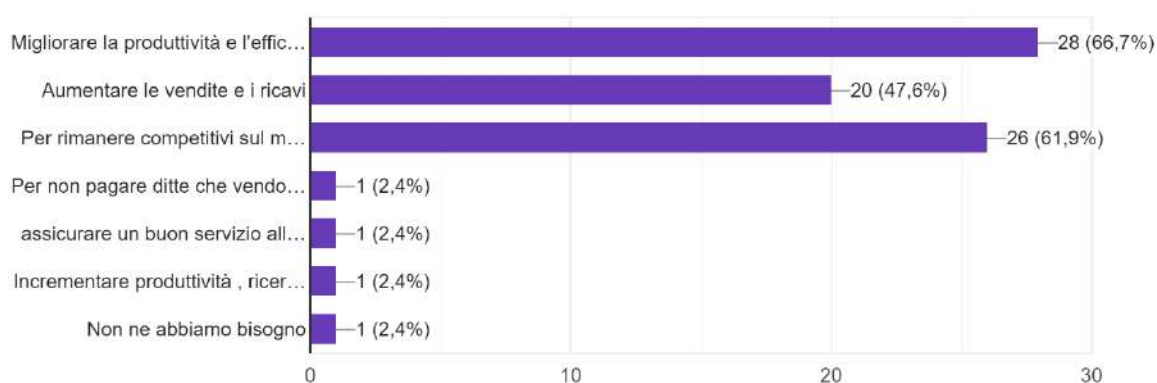


Figure 70 - Appendix1-Italy

12. Avete un team o un reparto dedicato all'IT nella vostra azienda?

42 risposte

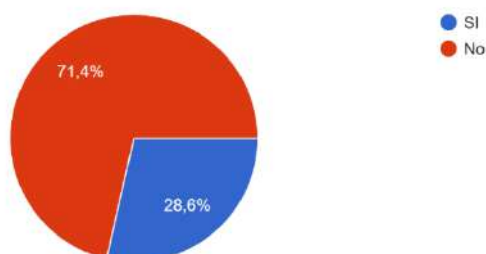


Figure 71 - Appendix1-Italy

13. Quali sono i dipartimenti della vostra PMI che richiedono competenze digitali e/o di programmazione? (è possibile selezionare più risposte)

42 risposte

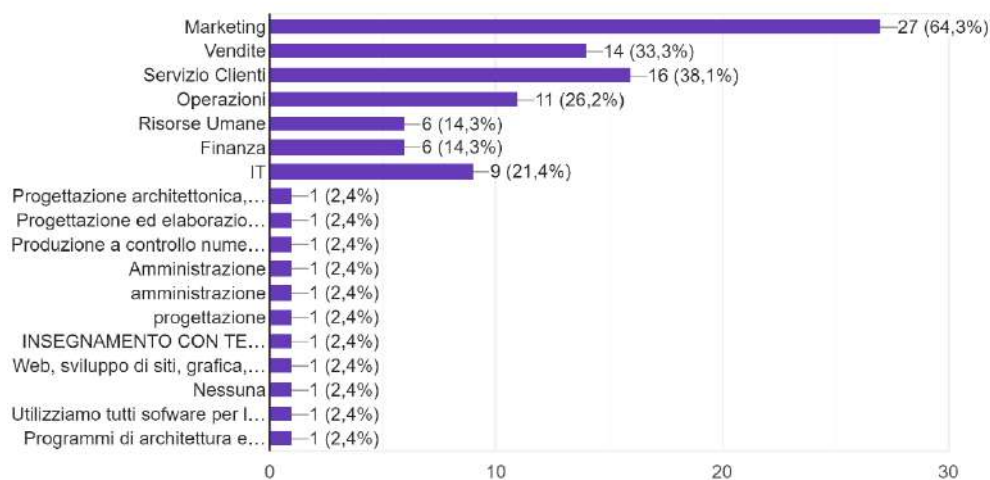


Figure 72 - Appendix1-Italy

14. Quali competenze digitali mancano attualmente ai vostri dipendenti? (è possibile selezionare più di una risposta)

42 risposte

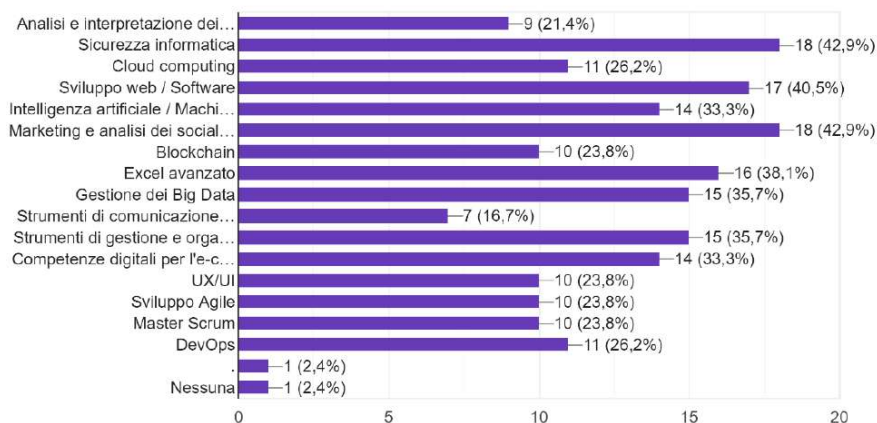


Figure 73 - Appendix1-Italy

15. Quanto siete sicuri della vostra capacità di valutare le competenze digitali dei vostri dipendenti?

42 risposte

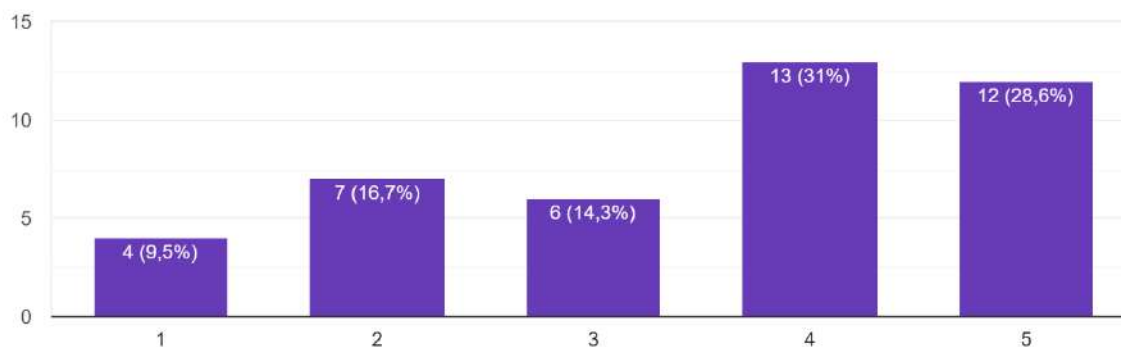


Figure 74 - Appendix1-Italy

16. Quali sono le principali barriere che impediscono di colmare il gap di competenze digitali nella vostra azienda? (è possibile selezionare più di una risposta)

42 risposte

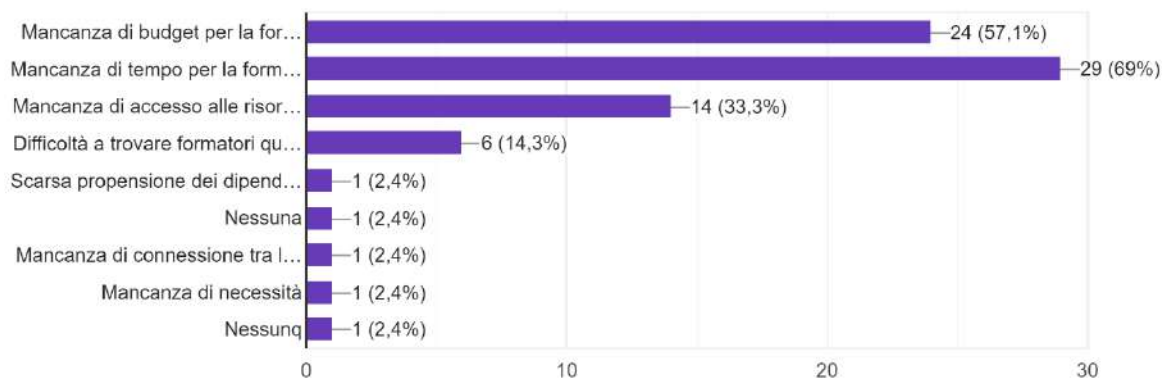


Figure 75 - Appendix1-Italy

17. Quali sono le soluzioni più importanti per colmare il gap di competenze digitali nella sua azienda? (è possibile selezionare più di una risposta)

42 risposte

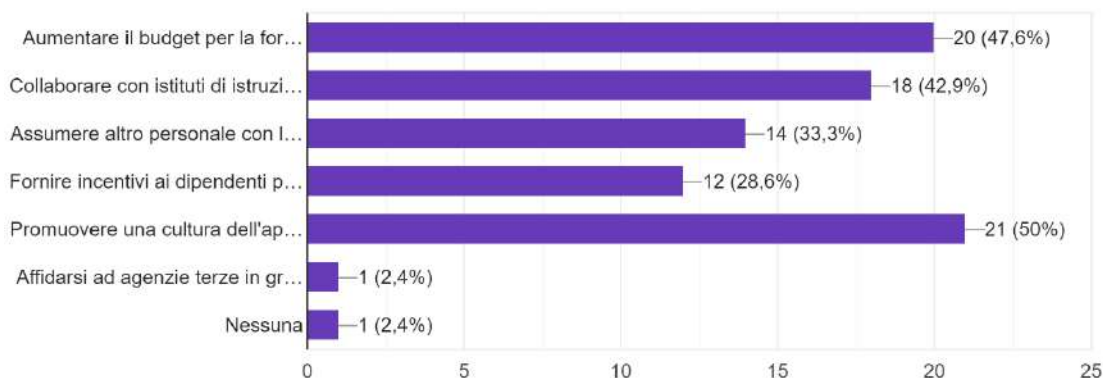


Figure 76 - Appendix1-Italy

18. Quanto è importante che il governo e le istituzioni educative sostengano lo sviluppo delle competenze digitali?

42 risposte

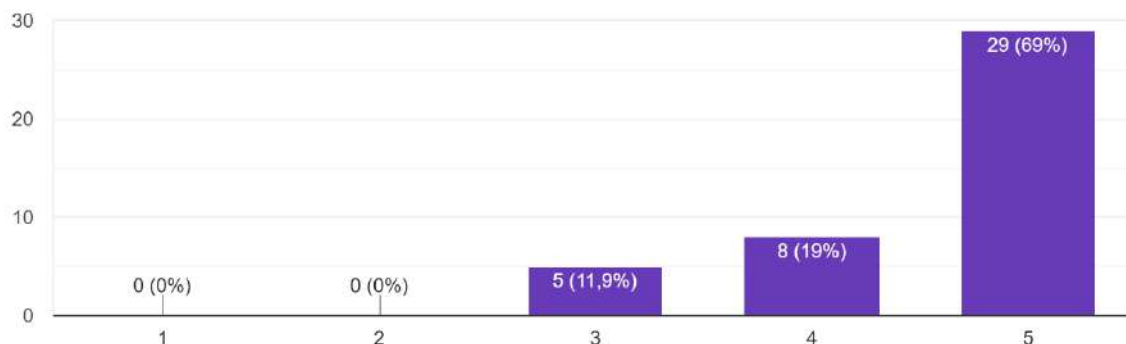


Figure 77 - Appendix1-Italy

19. Quali sono i metodi di formazione sulle competenze digitali più efficaci? (è possibile selezionare più di una risposta)

42 risposte

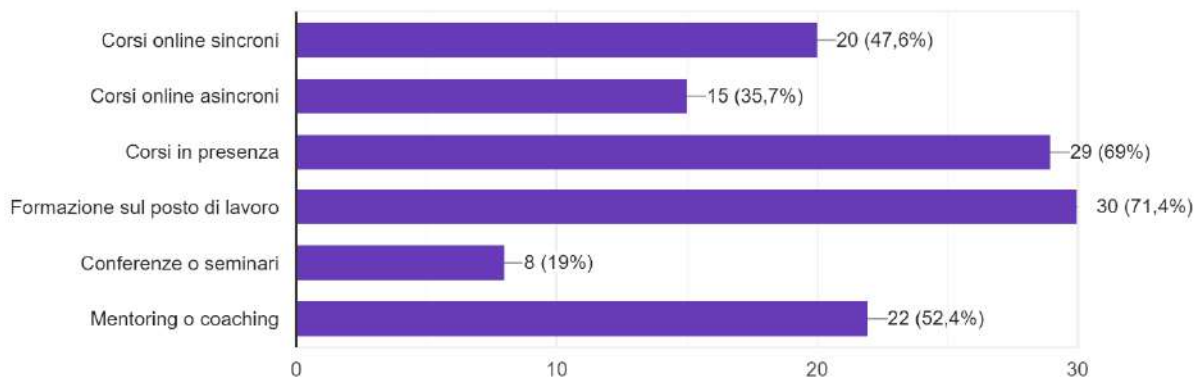


Figure 78 - Appendix1-Italy

20. Quali linguaggi di programmazione sarebbe utile che i vostri dipendenti imparassero? (è possibile selezionare più di una risposta)

38 risposte

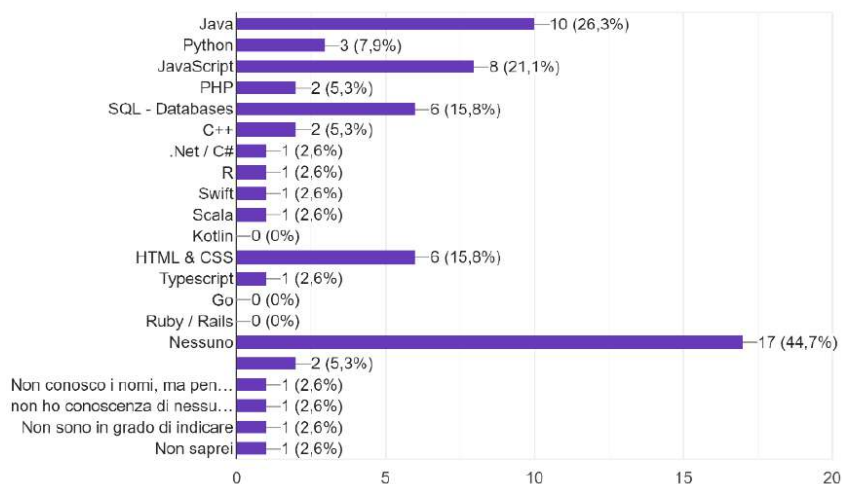


Figure 79 - Appendix1-Italy

21. Quali strumenti digitali dovrebbero imparare a usare i vostri dipendenti? (è possibile selezionare più di una risposta)

42 risposte

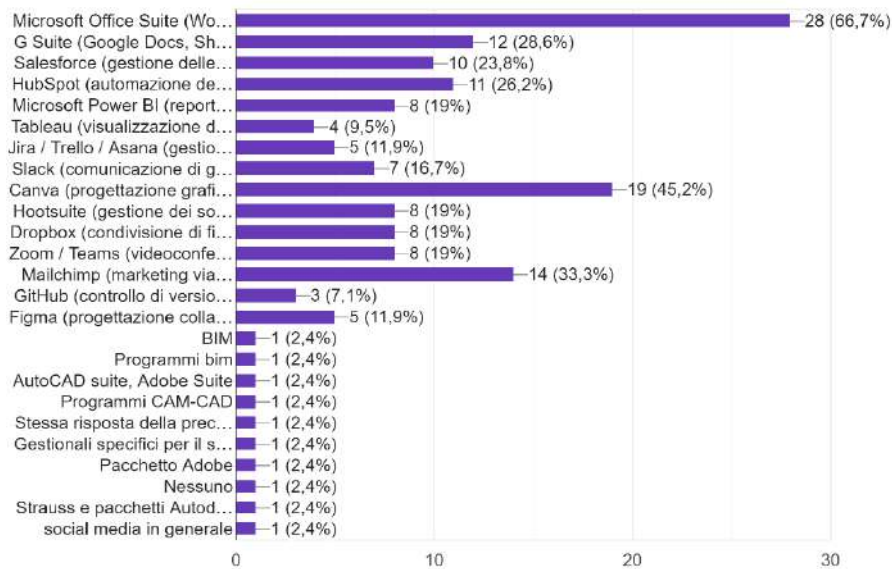


Figure 80 - Appendix1-Italy

22. Con quale frequenza prevedete di offrire ai vostri dipendenti una formazione di aggiornamento sulle TIC (tecnologie dell'informazione e della comunicazione)

42 risposte

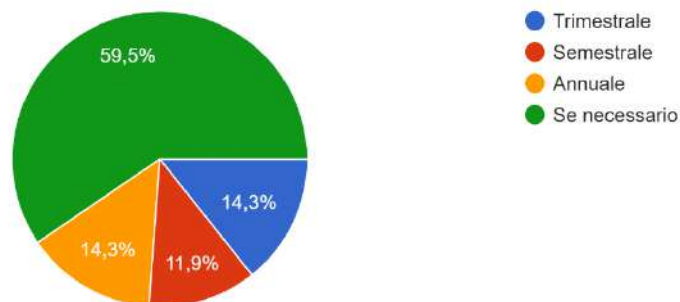


Figure 81 - Appendix1-Italy

Poland

Company size

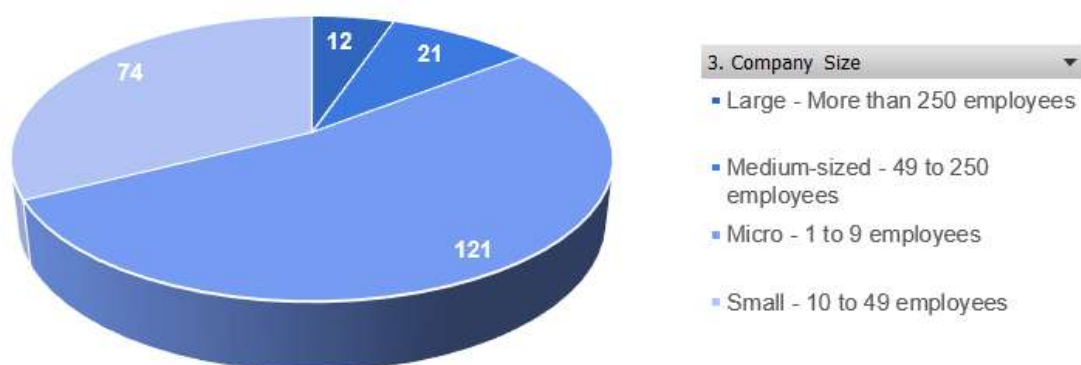


Figure 82 - Appendix1-Poland

Positions

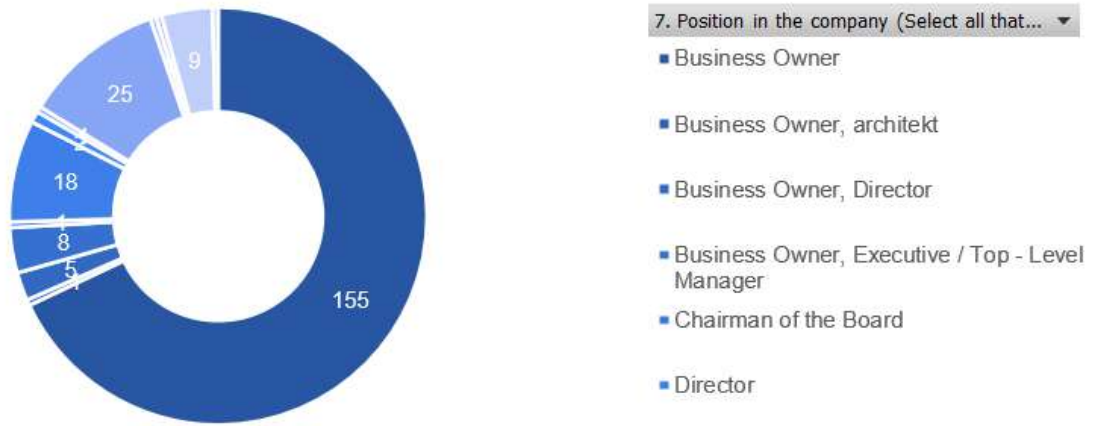


Figure 83 - Appendix1-Poland

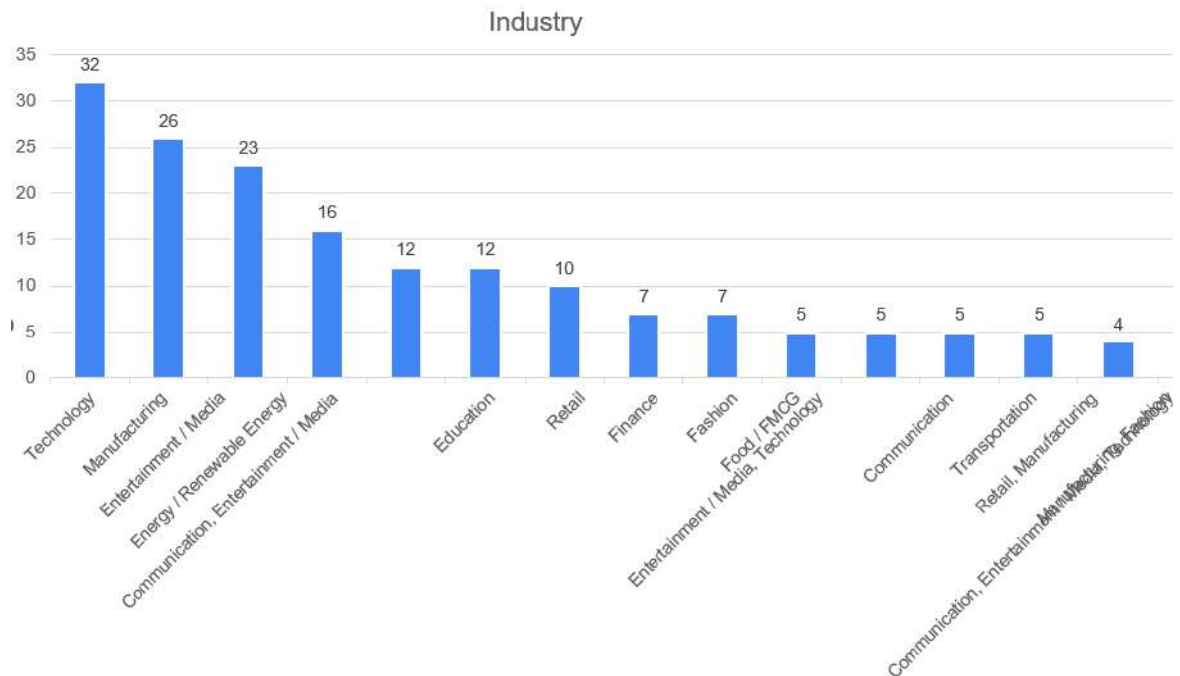


Figure 84 - Appendix1-Poland

Digital tools should SME employees learn to use

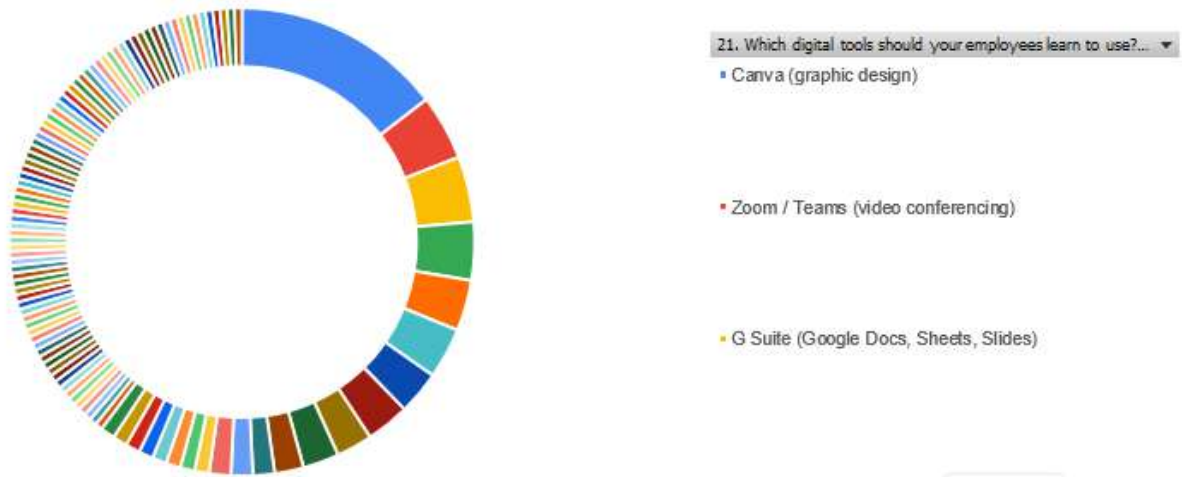


Figure 87 - Appendix1-Poland

Frequency of Providing ICT Training

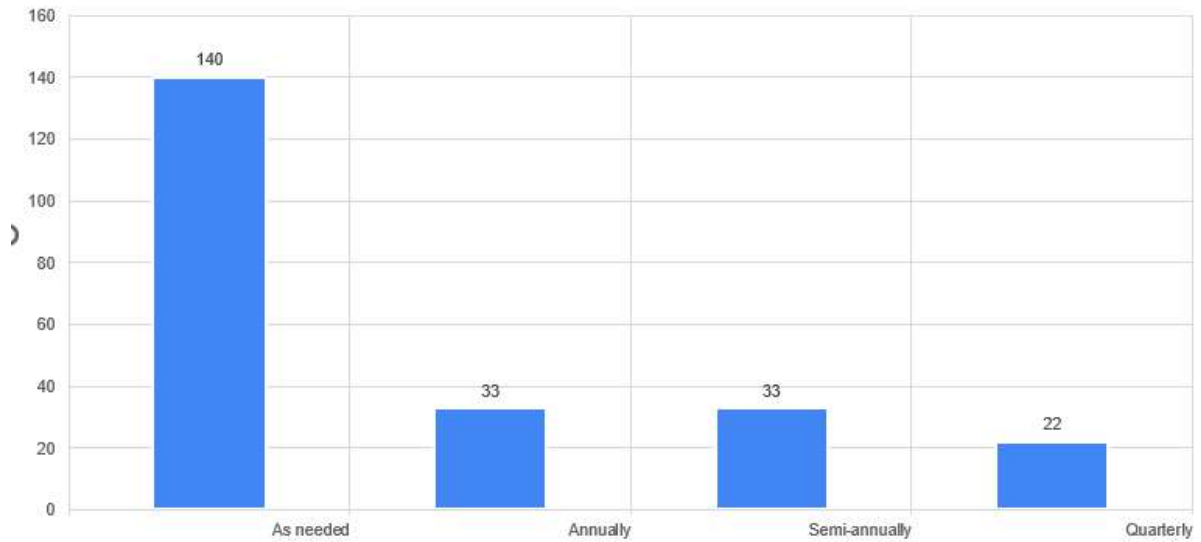


Figure 88 - Appendix1-Poland

Appendix 2

Consolidated Report Tables

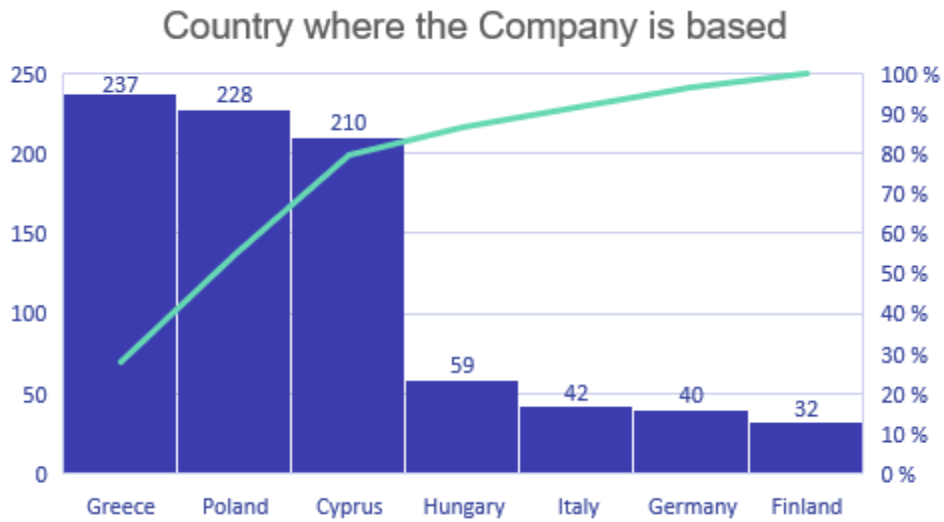


Figure 89 – Appendix 2 – Consolidated Data

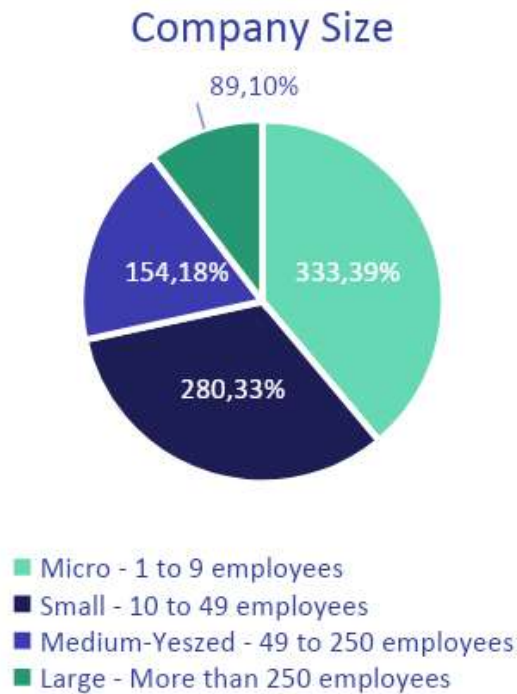


Figure 90 – Appendix 2 – Consolidated Data

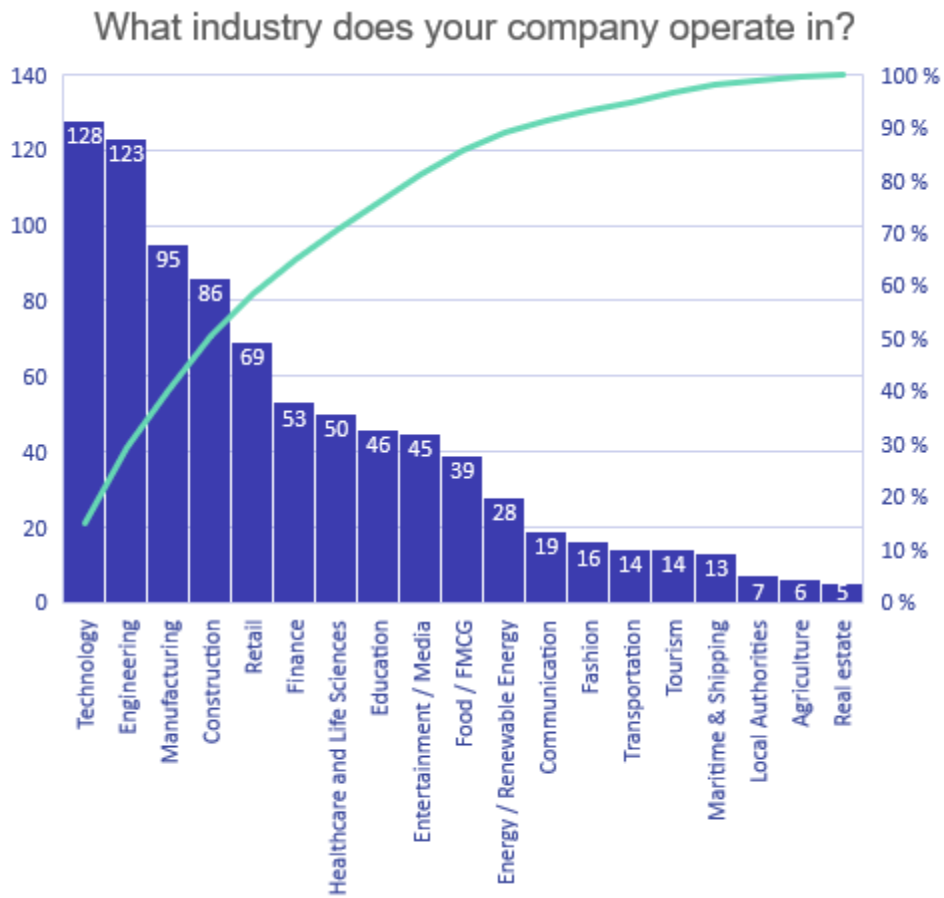


Figure 91 – Appendix 2 – Consolidated Data

Do you think that there is a digital skills gap within your company?

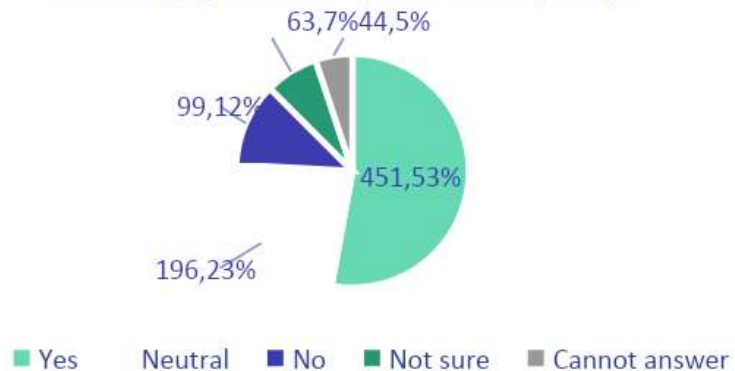


Figure 92 – Appendix 2 – Consolidated Dat

What are the primary barriers to closing the digital skills gap in your company?

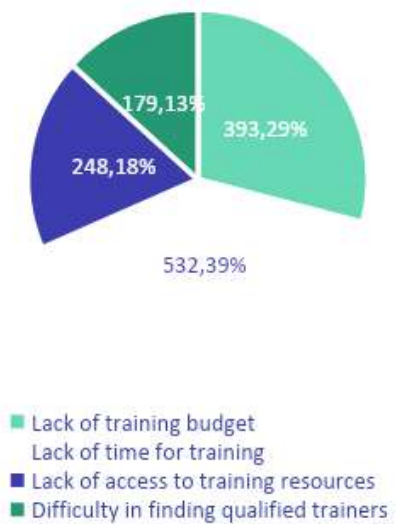


Figure 93 – Appendix 2 – Consolidated Data

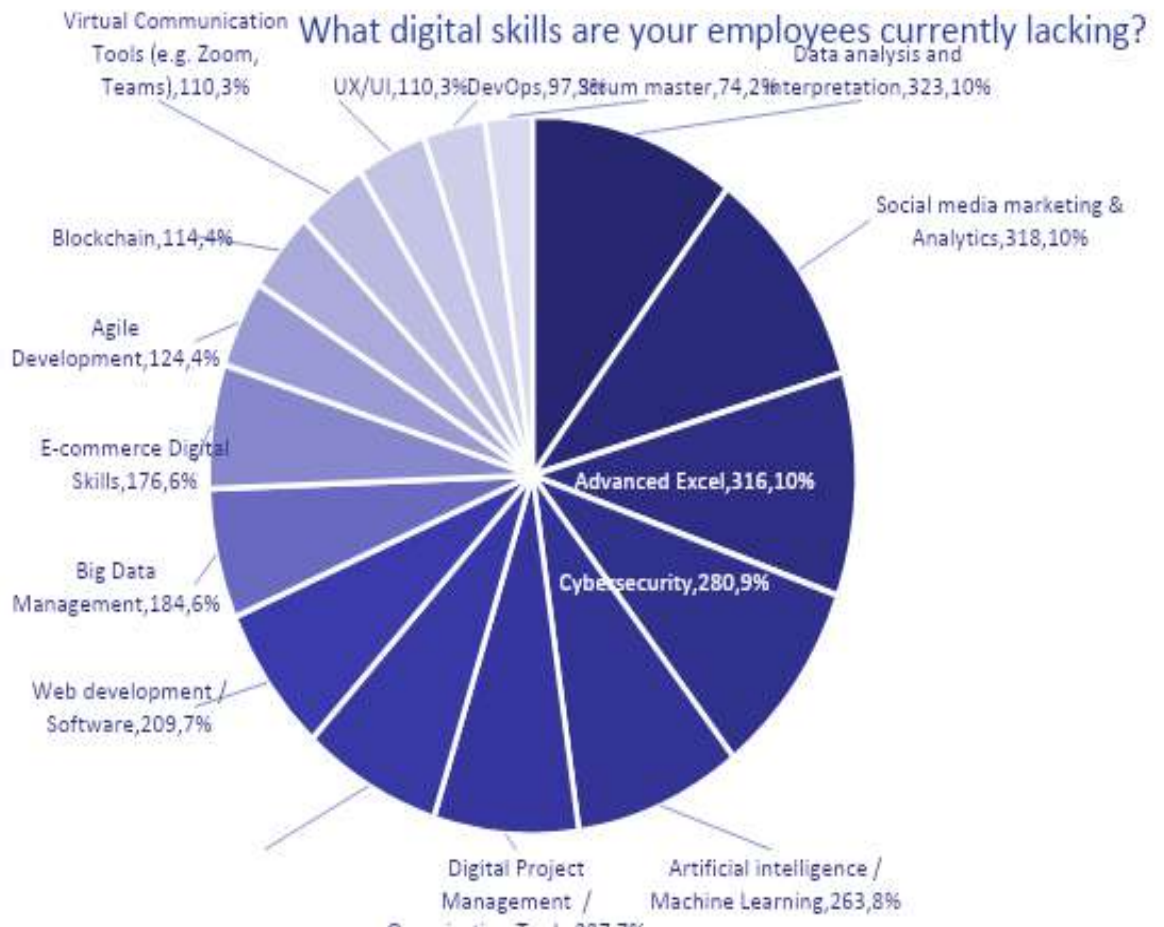


Figure 94 – Appendix 2 – Consolidated Data

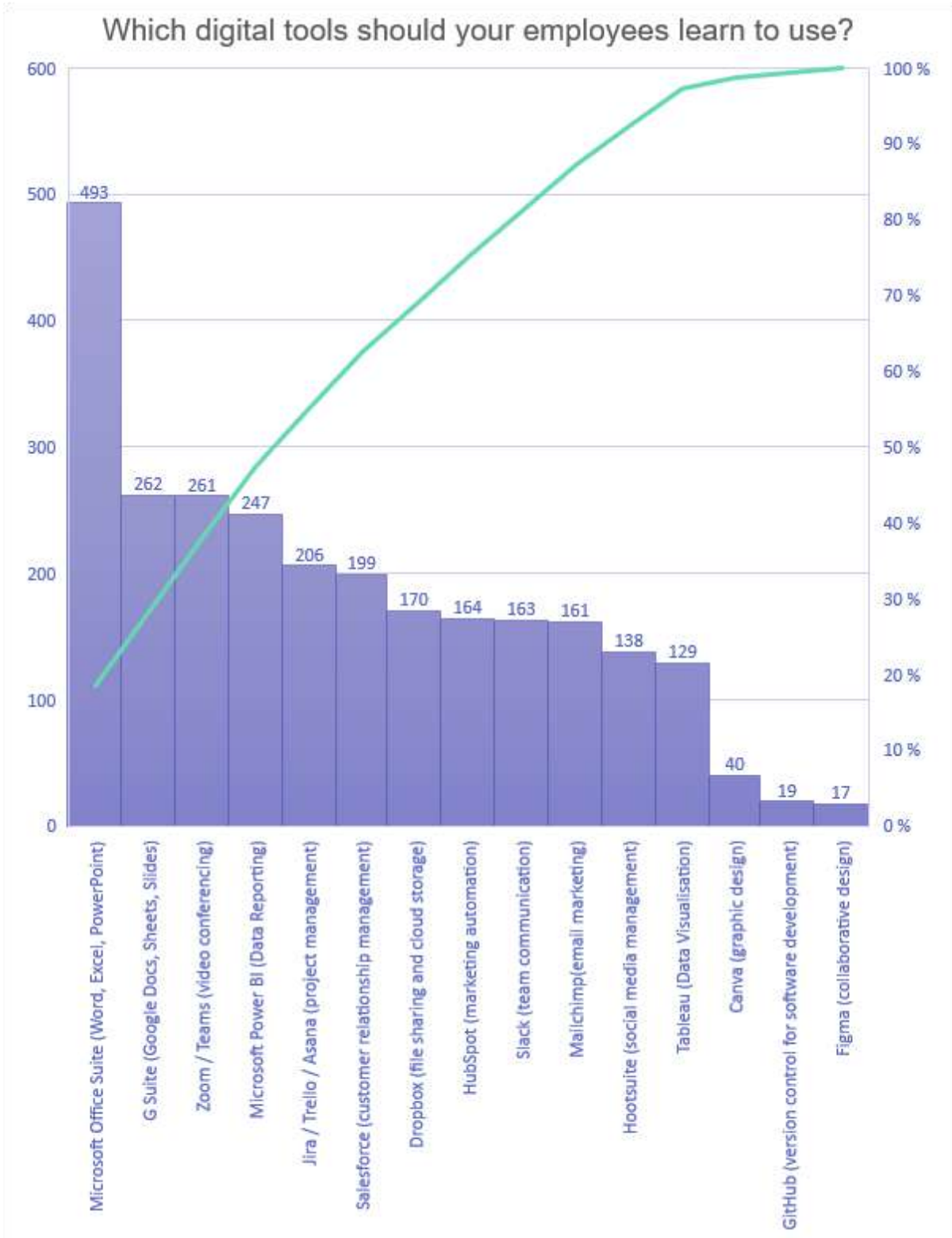


Figure 95 – Appendix 2 – Consolidated Data

Which programming languages would be beneficial for your employees to learn? (Select all that apply)

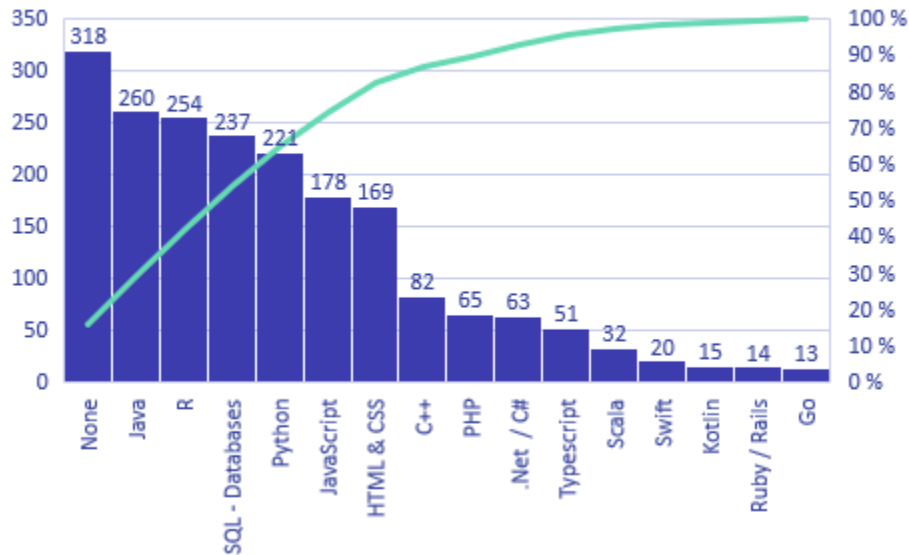


Figure 96 – Appendix 2 – Consolidated Data

What methods of digital skills training do you find most effective?

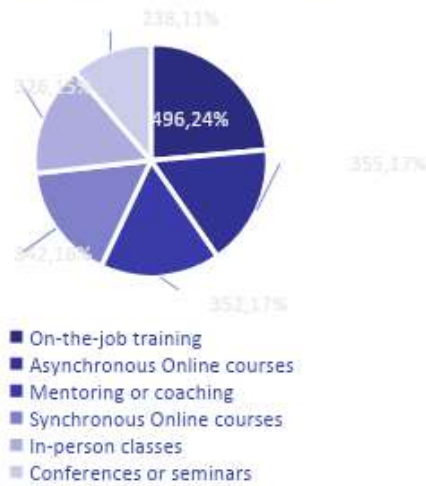


Figure 97 - Appendix 2 – Consolidated Data

How frequently do you plan to provide ICT
(Information and Communications technology)
upskilling training for your employees?

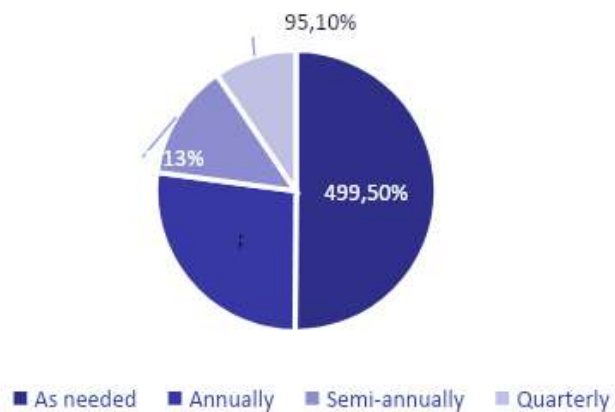


Figure 98 – Appendix 2 – Consolidated Data

Coordinator

Partners

Associated Partner**Disclaimer**

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